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CROSS-DIVISIONAL TEAMS

Water Utility Success

In this online article, learn about how Phoenix Water Services formed a cross-divisional team to address surface water quality issues, leveraging expertise from various departments. This collaborative approach led to both short-term and long-term solutions while enhancing the utility's problem-solving capabilities.

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OVERHEARD ONLINE

“There is a growing problem with viruses like the avian flu and bacteria that have acquired antibiotic resistance. We don't necessarily see symptoms until there's a serious outbreak.”

— *U.S. House Funding Boosts Texas A&M Wastewater Surveillance Project*

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BUG OF THE MONTH

Exocellular Polysaccharide

In this month's wastewater microbiology spotlight, licensed wastewater treatment operator and microbiologist Ryan Hennessy examines how elevated levels of exocellular polysaccharide may contribute to viscous flocs.

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CUSTOMER DATA

How to Manage a Security Breach

As a public utility, safeguarding customer data, such as names, addresses and payment information, is crucial. However, cyberattacks targeting this valuable data are common. In this online article, learn how effective communication with the public is essential in the event of a security breach.

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let's be clear

A Chance to Blow Your Horn

WORLD TOILET DAY CALLS ATTENTION TO ONE OF THE MOST CRITICAL ADVANCEMENTS IN HUMAN HEALTH IN THE HISTORY OF THE PLANET

By Ted J. Rulseh, Editor



How often do you remind yourself that you are part of a profession that has saved more human lives than all the doctors combined?

Doctors themselves would readily say so — because wastewater collection and treatment — public sanitation — prevents all manner of miserable and often fatal waterborne diseases. World Toilet Day, on Nov. 19, is a time to remember and celebrate that achievement.

World Toilet Day is sponsored by the United Nations as a way to emphasize that every person has a right to safe sanitation. It is also a reminder of the need to meet the UN's Sustainable Development Goal 6: safe toilets and water for all by 2030.

PROGRESS NEEDED

And how are we doing toward meeting that goal? Well, according to the World Health Organization and UNICEF, some 3.5 billion people live without safe toilets and — at least partly as a consequence — 2.2 billion live without safe drinking water.

In addition, some 419 million people have no toilets; they go to the bathroom out in the open. And one-fourth of the global population — 2 billion people — do not have basic facilities at home to wash their hands with soap and water.

UNICEF adds that unsafe water and lack of sanitation, and hygiene are responsible for the deaths of around 1,000 children under age five every day. At the current rate, by 2030, some 3 billion people will still lack safe toilets, 2 billion will lack safe drinking water and 1.4 billion will lack basic hygiene facilities. So, there is a long way to go.

You do valuable work.
You should not hesitate
to let members of your
public know just how
valuable it is. World
Toilet Day is a great
chance to do so.

A LOOK BACK

Most of these sanitation issues exist in the developing world. But really it was not so long ago that the United States had serious deficiencies. Yes, most people had toilets, and most homes were connected to sewers or septic systems.

But until the 1970s, raw or minimally treated sewage was routinely discharged to rivers and streams. The Clean Water Act of 1972 started the process of turning that around, setting a goal to make the nation's waters fishable and swimmable — and pathogen-free.

Wastewater treatment plants were a critical part of that. Hundreds of billions of dollars were invested in plant construction and upgrades. Tens of thousands of operators were hired and trained to staff those facilities. And today, while many waters remain impaired for various reasons, the situation overall is remarkably better than half a century ago.

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It's useful for people to remember how much progress has been made — now much better the world is — because of humble things like toilets, sewers and treatment facilities.

OBSERVING THE DAY

So, how can you and your team mark World Toilet Day and in the bargain call attention to the absolutely essential work you do? You might send out a news release announcing the day and citing your facility's accomplishments — your permit compliance record, awards your plant and your team members have earned.

You could ask to be a guest on a radio talk program to tell about how your plant helps keep your community healthy and safe. Invite people to an open house and a tour of your facility. Work with community groups to organize a cleanup of a lakefront or stream.

At the very minimum, use the day to remind your staff members why they are just as important as those who deliver other public services — police and fire protection, parks and recreation, street maintenance, and others.

You do valuable work. You should not hesitate to let members of your public know just how valuable it is. World Toilet Day is a great chance to do so. For more information, visit un.org/en/observances/toilet-day. **tpo**

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From Biogas to Revenue

PRODUCING RENEWABLE NATURAL GAS PROVIDES ECONOMIC, ENVIRONMENTAL AND RESILIENCY ADVANTAGES FOR THE WESTERN VIRGINIA WATER AUTHORITY

By Steve Lund

Putting biogas to work has been a priority at the Roanoke Regional Water Pollution Control Plant since it was built in 1951.

Back then, biogas from the plant’s anaerobic digesters powered pumps to move raw sewage.

“You have to give our predecessors credit for having a beneficial use all those years ago,” says Scott Shirley, chief operating officer for water quality with the Western Virginia Water Authority. “Since the inception of the plant, we’ve been on a journey to maximize the beneficial use of biogas.”

Over the years, the plant staff found other uses for the biogas, such as boiler fuel to heat the digesters and for a combined heat and power system. Recently, the plant began converting biogas to renewable natural gas fed into the utility network.

The new plan generates Renewable Identification Numbers, which are worth money under the U.S. EPA’s Renewable Fuel Standards Program. “With the economics of this as well as the benefit to the environment and to the community, we believe it’s the highest beneficial use of the gas,” Shirley says.

“Since the inception of the plant, we’ve been on a journey to maximize the beneficial use of biogas.”

SCOTT SHIRLEY

the engines,” Shirley says. “A lot of plants experience similar challenges.”

One potential solution was to blend the biogas with natural gas to make a more stable fuel, but the authority decided to take another route. “Options have been developed to improve the reliability of cogeneration systems,” Shirley says, “But in our case, concurrently with this we did a major upgrade of the plant electrical system to improve reliability.

MULTIPLE FACTORS

Several factors beyond economics influenced the decision to produce RNG. One was a maintenance issue with the combined heat and power system: The emission controls on the system didn’t react well to the variable BTU content of the biogas.

“Basically, if the system senses a drop in BTU value, it tries to enhance the burn, and it causes damage to



Workers spread concrete for a new digester at the Roanoke Regional Water Pollution Control Plant.



The Roanoke Regional Water Pollution Control Plant treats an average of 37 mgd.

“The cogen units will be reinstated to run just off natural gas, and they’ll be part of a suite of generators available as a backup system. If we lose utility power, we have a 2 MW Cummins diesel backup generator, a diesel-powered 1,700 hp Roots blower, and then the two 500 kW Waukesha cogen units. Between those, we can supply power into our own grid and run for an extended period if we lose power.”

The authority has experienced flooding in the past and has made substantial investments in flood protection. Says Shirley, “We now have one foot of freeboard from a 100-year flood. Part of that investment extends to the electrical system.

“If we had stayed on the previous distribution system, the two substations that could feed the plant were subjected to the same flood risk. In this larger power project, we connected to a transmission line that gets us to a second substation geographically separated from that risk.”

BOOSTING GAS PRODUCTION

The Roanoke Regional Water Pollution Control Plant (55 mgd design, 37 mgd average) is an advanced facility with seven primary anaerobic digesters and three secondary digesters. As part of its RNG conversion, the plant team fitted five of the digesters with new Ovivo linear-motion mixers and with concrete covers cast in place.

Refinement to RNG includes pretreatment (Unison Solutions) to remove hydrogen sulfide, moisture, siloxanes and VOCs, plus compression to pipeline pressure and membrane separation to remove CO₂. An interconnect station odorizes, meters and monitors gas delivered to the Roanoke Gas pipeline. Gas production from the digesters with the new mixers has more than met expectations.

“It looks like we’re going to get about 308,000 cubic feet per day,” Shirley says. “That would generate 2,200 RINs per day, and the current RIN value is in excess of \$3.” At that price, the project would pay for itself in about five years.



Digesters were upgraded and new mixers added when the Western Virginia Water Authority began converting its biogas to renewable natural gas.



Membrane filters are part of the Unison Solutions system to convert biogas to renewable natural gas.

If the price falls to the historical normal level, payback would take about 10 years. After Roanoke Gas and the authority recover their costs, they will split the revenue from the RINs.

CHANGING MARKETPLACE

Shirley says the market for renewable energy credits tilts toward producing RNG instead of burning raw biogas at the plant. RNG also has environmental benefits. “In the environmental analysis, we’re displacing natural gas that generally would be derived through fracking,” Shirley says. “When that is replaced by RNG, we believe that’s substantially better for the total environmental picture.”

The authority may add digestion of high-strength food waste, but U.S. EPA rules require separate monitoring of gas created that way and through digestion of biosolids: the latter is more valuable. The authority might eventually dedicate some digesters now offline to handling food waste.

“They’re in reserve for a later project to consider whether it’s worthwhile for us to look at a high-strength waste receiving program,” Shirley says.

The RNG conversion involved a major electrical upgrade, backup power and flood protection along with gas treatment. “We take the approach that it’s important to harden our assets and really plan well for emergencies,” Shirley says.

“The engineers we work with tell me that I like belts and suspenders. Yes I do. I’ve been around 29 years and I’ve been through enough disasters and challenges. I want all options.” **tpo**

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IN A CAREER-LONG COMMITMENT TO THE WATER INDUSTRY IN A PROSPEROUS REGION, JODY ZABOLIO BALANCES OPERATIONS AND GROWTH WHILE ALSO GIVING BACK

STORY: **Andrew Dugan** | PHOTOGRAPHY: **Olivia Ogren-Hrejsa**

There's no standing still for Jody Zabolio in leading the operations group at Upper Trinity Regional Water District.

As director of operations and water resources for his North Texas district, he's responsible for four water reclamation plants and two drinking water plants in one of the nation's fastest-growing regions.

With 35 years in the industry, Zabolio has climbed through the ranks of water and wastewater utilities and professional organizations through his drive to make them better. Backed by his team of operators, mechanics and administrators, he has spent his career rising to every occasion to keep up with the region's ever-expanding demand for water.

A FOR EFFORT

A native of Houston, Zabolio received his bachelor's and master's degrees in civil engineering with a concentration in water and wastewater from Texas A&M University. "In my first civil engineering classes, I got a C in my structural class, a B in transportation, and an A in water," recalls Zabolio, winner of a 2023 William D. Hatfield Award from the Water Environment Association of Texas. "Based on those limited data points, I leaned into my strengths."

After graduation in 1989, he moved to the Dallas-Fort Worth metroplex and began his career as a civil engineer at CH2M Hill (now Jacobs), designing and planning water and wastewater facilities. It was the early stage of a North Texas population boom that would shape his career.

As a consultant, he designed various treatment projects throughout the region including water and wastewater plants and reuse systems. After seven years of consulting, he decided to move inside the fence line and see his projects come to fruition after the construction cranes left.

He took a job with the Fort Worth water department as an assistant program manager. In the face of sanitary sewer over-



Jody Zabolio, P.E., director of operations and water resources at the Upper Trinity Regional Water District

flows and pressure from federal and state regulators to get them under control, the city had begun a \$230 million program to upgrade its collection system. At the time, it was the largest public works program the city had ever undertaken.


"After a couple of years as the assistant program manager, the director of the department asked if I would be interested in wastewater treatment, specifically as a plant engineer," he recalls. "I went for it." During eight years at Fort Worth, Zabolio worked

“Coming to work at the district was full circle, since I would be working at a facility I had helped design in my CH2M Hill days.”

JODY ZABOLIO



Zabolio, front, and Mark Wootton, senior wastewater operator, review the polymer and solids flow and the torque percentage within the centrifuge in the dewatering building.



Jody Zabolio, P.E.

Lewisville, Texas

POSITION:
Director of Operations and Water Resources

CERTIFICATIONS:
Professional Engineer, Wastewater A (highest)

EDUCATION:
Bachelor's and master's degrees, civil engineering, Texas A&M

AFFILIATIONS:
WEA of Texas, WEF, AWWA, NACWA

AWARD:
William D. Hatfield Award, WEA of Texas

GOAL:
Promote the water industry as a place for fulfilling careers



In the motor control center's electrical room, Robert Follenfant, right, electronic technician, discusses a ballast return pump with Jody Zabolio.



The 4 mgd (design) Riverbend Water Reclamation Plant was the first in Texas to use the BioMag magnetite ballast treatment system (Evoqua Water Technologies).

ular at state and national water conferences, presenting what his team has learned during its biological phosphorus removal efforts, on-site hypochlorite and ozone generation projects, and membrane filtration operations, pushing the field forward and offering insights to utilities facing similar challenges.

“ [Magnetite] enables us to treat wastewater in a smaller footprint, because we don't need as large a basin to settle the sludge.”

JODY ZABOLIO

Along the way, he has taken on volunteer and leadership roles with organizations including the Water Environmental Association of Texas, for which he served as president in 2010-11. He now serves on the National Association of Clean Water Agencies board of directors.

During COVID, utility communication became more crucial than ever. The district's leaders, including Executive Director Larry Patterson and Chief Administrative Officer Jan Morris, coordinated efforts to quarantine

team members while continuing daily operations and construction. “Like most folks, we had to rely on phones and digital platforms like Microsoft Teams to communicate,” Zabolio says.

“We split our crew into smaller teams to manage operations and maintenance without physical contact between shifts. Our deputy director of operations, Ben Hodges, was the intermediary between all of them. He played a key role in our success during the pandemic.” Hodges, a champion of workforce development at the district and in North Texas, was a 2016 William D. Hatfield Award winner.

ON THE CUTTING EDGE

In tackling unprecedented growth, creative thinking has been mandatory. At the Riverbend Water Reclamation Plant, housing developments have surrounded the facility, contributing to the need to expand while restricting the ability to do so.

Riverbend originally used a sequencing batch reactor process, a technology that works well for communities in the early stages of growth but less so with larger flows. “In 2016, we had enough growth to expand the plant, so we converted it from an SBR to a normal, industry-standard activated-sludge plant,” Zabolio says. “As part of that project, we implemented ballasted flocculation technology.”

At Riverbend, influent first flows through screens (HUBER Technology) and grit removal. Blowers (Aerzen) and a combination of overhead and submerged mixers (Invent and Flygt, a Xylem brand) mix and supply oxygen to the aeration basins, which are followed by secondary clarifiers (Evoqua Water Technologies). Cloth media filters (Aqua-Aerobic Systems) provide tertiary polishing before UV disinfection (Trojan Technologies).

on a host of projects including a sand ballast system to intensify the settling process and increase wet-weather capacity.

In 2004, he applied for an opening at the Upper Trinity district, based in Lewisville, as a senior engineer responsible for the treatment process and capital improvements: “Coming to work at the district was full circle, since I would be working at a facility that I had helped design in my CH2M Hill days.”

BALANCING ACT

The Upper Trinity district provides water and wastewater services to 350,000 Texans and counting. Its vast service area, mainly in Denton County north of Dallas, includes 29 utilities and communities, 22 miles of sewers and seven lift stations feeding four water reclamation plants:

- Lakeview Regional, 5.5 mgd
- Peninsula, 2 mgd
- Riverbend, 4 mgd
- Doe Branch, 4 mgd (now being expanded to 12 mgd)

The district also operates two water treatment plants: the Thomas E. Taylor Regional Water Treatment Plant (rated for 70 mgd) and the Tom Harpool plant (30 mgd). These facilities, along with 103 miles of water distribution pipeline and two pump stations, enable the district to treat and distribute a daily average of over 40 mgd of drinking water, with peak demands exceeding 80 mgd.

Nonstop growth over the past two decades has persistently challenged Zabolio and his team to operate the six facilities as effectively as possible.

GETTING THE WORD OUT

Public communication has been integral to managing growth, and Zabolio has always been open about what his team is working on. He's been a reg-

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BOOSTING CAPACITY

Stuck between a rock and a hard place, Zabolio and his team searched for solutions to intensify Riverbend's process, ultimately selecting the Bio-Mag magnetite ballast treatment system (Evoqua) after seeing the process in action at a few plants in Massachusetts. Riverbend became the first plant in Texas to use the technology.

"Magnetite, a naturally occurring iron ore, accelerates the settling of activated sludge due to its high specific gravity," Zabolio says. "Because magnetite is iron, we can use a magnet to separate it out after treatment, recover over 90% of it, and return it to the process. It enables us to treat wastewater in a smaller footprint, because we don't need as large a basin to settle the sludge. Along with new secondary clarifiers and some additional equipment and hardware, we nearly doubled the plant's biological treatment capacity."

The ballast project relied on an alternative delivery method called construction manager at risk to bring the design to life. "CMAR isn't a silver bullet, but the more complex a project, the more it makes sense," says Zabolio.

"We were able to anticipate equipment lead times and supply chain issues to complete the project on time and meet our compliance schedule. One of the things I like about CMAR, compared to prepurchasing, is that the utility doesn't take ownership of the equipment until the contractor hands it off. Plus, it's an open book on costs."

The district is among the few utilities discharging highly treated effluent to its own drinking water source, Lewisville Lake, making it a practitioner of indirect potable reuse. Upper Trinity has a permit to reuse a portion of the raw water it imports from East Texas that is ultimately discharged from its four reclamation plants into Lewisville Lake. The lake water feeds the Thomas E. Taylor water plant; reuse water comprises a little over 10% of the district's drinking water supply and is vital to meeting the growing area's demands.

FULL SPEED AHEAD

The district's service area continues to expand, and Zabolio still helps guide the district's present and future. "We're building a new lake in East



Team members working with Jody Zabolio (left) at the Upper Trinity district include, in order ascending the stairs, Ven Hodges, deputy director of operations; Jeff Mlak, operations manager; and Joe Thompson and Steven McHenry, operations supervisors.

GOING GLOBAL

While exploring how to get involved with industry association committees, Jody Zabolio became part of the initiative to move the U.S. Stockholm Junior Water Prize competition from paper submissions to today's presentation style.

The Stockholm prize is for students ages 15-20 who develop research projects aimed at helping solve major water challenges. "The idea excited me because I had been participating as a judge in local science fairs," Zabolio says.

Being on the planning committee, Zabolio helped scope out science fairs to identify students with water-related projects and invite them to the in-person competition. The ultimate goal was to send the winner to Sweden to compete for the international prize. The Water Environment Association of Texas hosted the first two in-person competitions in Dallas in 2002 and 2003.

"It's phenomenal what these kids are working on," Zabolio says. "Some are at the point where they're working with universities and graduate students, contributing to their research. It was fascinating to see a kid take a project from a local science fair all the way to an international competition in Sweden."

Those early efforts helped create a legacy of American success. The winner of the first on-site competition in 2002, Katherine Holt of Virginia, went on to win the international prize that year. The most recent American winner was Naomi Park of Riverside, Connecticut, in 2023, representing Greenwich High School.

Texas right now, Lake Ralph Hall," he says. "We expect it to be online in 2026, and it will play an important part in providing water to our expanding water plants.

"We also recently broke ground on an expansion of the Thomas E. Taylor plant, raising its capacity to 85 mgd. Our capital planning budget has been as large as I've ever seen between growth and inflation. It's an exciting time to be here." tpo

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Conservation Makes WaterSense

THE TWIN CITIES UTILITY'S WATER EFFICIENCY GRANT PROGRAM INCENTIVIZES MUNICIPALITIES AND WATER CUSTOMERS TO CONSERVE AND HELP PROTECT THE REGION'S AQUIFERS

By Sandra Buettner

Leaders at the Metropolitan Council in the Twin Cities knew that area aquifers were not infinite and needed to be conserved to meet the needs of future generations.

They also have faced droughts in the past few years. Minnesota may be the state of 10,000 lakes, but the council wants to protect those lakes and other water sources so that today's residents and future generations can use and enjoy them.

The Met Council, based in St. Paul, operates the region's wastewater treatment systems and is responsible for long-range planning in the seven-county Twin Cities metro area. The utility treats an average of 180 mgd of wastewater and has capacity to treat 251 mgd for the service area's nearly 2.7 million residents.

OFFERING INCENTIVES

"Many regions across the country are facing the reality that groundwater is not an unlimited resource," says Henry McCarthy, grant program coordinator. "We are working to ensure that development in our region does not outpace the ability of our aquifers to retain adequate supplies."

To that end, the council created the Water Efficiency Grant Program to encourage customers to use water wisely and reduce demand on the groundwater. The council's 2015 Master Water Supply Plan identified where water use was the greatest and pinpointed supply issues.

The council proposed the grant program to the Minnesota Legislature as a potential use of Clean Water Fund dollars. In 2015 the Legislature authorized the creation of a grant fund to help growing communities reduce water consumption and future infrastructure costs.



A joint study by the Met Council and the University of Minnesota found that using smart technology can reduce water use on lawns by as much as a third.

“We are working to ensure that development in our region does not outpace the ability of our aquifers to recharge.”

HENRY MCCARTHY

The funds are available to cities that either operate a municipal water system of their own or are served by another municipal system. The program also requires them to replace specified water-using devices with approved devices that use less water. For existing homes, some eligible items are:

- Toilets, shower heads, irrigation controllers and irrigation spray sprinkler bodies with WaterSense labeled models
- Irrigation system audit conducted by a WaterSense-approved professional
- Washing machine and dishwasher replacement with machines carrying the Energy Star label from the U.S. Department of Energy.

"Municipalities are allowed to design their own programs," says McCarthy. "Some may focus on a single device they are promoting, while others offer several device options for rebates."

TRAVELING TRAILER

Besides promoting the Water Efficiency Grant program and water-saving ideas, the Met Council paid for a traveling education trailer using money from Clean Water, Land and Legacy Amendment funds. The University of Minnesota's Turfgrass Science Team, which built the trailer, takes it to community events in the Twin Cities region.

(continued)



FEDERAL SUPPORT

The council collaborated with the U.S. EPA WaterSense program to help facilitate the grants. The utility promoted the low-cost purchase and installation of EPA WaterSense products for communities, reducing municipal water use. The partnership enables the council to promote to its communities the benefits of using WaterSense label products.

Minnesota cities like Cottage Grove that have their own municipal water systems are eligible for water efficiency grants. Cities that rely on other municipalities for drinking water are also eligible.

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A faucet in a community garden in Hopkins, Minnesota, within the service area of the Metropolitan Council.

The trailer enables the turfgrass team to inform community residents about topics including lawn water conservation, seeding, smart irrigation, bee lawns and more.

“After a long winter, residents look forward to the warm summer months,” says McCarthy. “More water tends to be used on their lawns. That increases the stress on water resources and supply systems, driving up costs and putting engineered water systems at risk.”

The trailer can be reserved free of charge for community events such as farmer’s markets, home expos and county fairs. A science team representative is available to speak at events. In 2023 alone, the trailer team visited and spoke at 25 neighborhood events.

METRICS AND ACCOLADES

The Water Efficiency Grant Program has gone through three funding cycles, and a fourth began in July 2024. The Met Council’s Water Efficiency Grant program is saving a total of 200 million gallons of water per year. The council also partnered with 45 municipalities.

For its efforts, the Met Council received a 2023 Excellence Award in Promoting WaterSense from the EPA. tpo

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The team at the Newmarket Wastewater Treatment Facility includes, from left, Todd Gianotti, maintenance supervisor; Kate Preston, operator; Ben Trottier, chief water operator; Sean Greig, environmental services director; Sue Landale, administrative assistant; Sam Heffron, operations supervisor; and James Barlow, operator.



Absolutely Crushing It

A MAJOR CLEAN-WATER PLANT UPGRADE HAS PUT THE NEW HAMPSHIRE TOWN OF NEWMARKET ON THE MAP FOR SUCCESS IN NITROGEN REMOVAL

STORY: **Ted J. Rulseh** | PHOTOGRAPHY: **Adam Perri**

A new total nitrogen permit limit was coming for the town of Newmarket. That meant upgrading an outmoded clean-water plant to the tune of \$14.1 million.

The results have been impressive. The plant's 4-stage Bardenpho process yields effluent that consistently beats a recently imposed total nitrogen permit limit. Sean Greig, environmental services director for the town, attributes that to a careful design process that included intensive regular meetings with the town's consulting engineers.

He also credits his team members for their dedication and their willingness to strive for optimum plant performance. "We have one of the best teams in the state," says Greig, winner of a 2023 William D. Hatfield Award from the New Hampshire Water Environment Association.

"Our team members are cross-trained on everything. They know I like to test the limits and see what happens. We're not afraid to push the envelope. We're not afraid to make changes.

"With the old trickling filter facility we were discharging about 62,000 pounds of total nitrogen per year. When I did the math on the new design I thought we would get down to 9,000 or 10,000 pounds. With our staff's optimization, we have actually been discharging 3,000 to 5,000 pounds per year. So we are absolutely crushing what our predictions were."

A CHOSEN CAREER

Greig has been with Newmarket (population, 8,000) for 29 years. He grew up in Dover, New Hampshire, and earned a bachelor's degree in business from Norwich University. Starting out in a tough job market, he became a manager for an athletic footwear store chain but found that unsatisfying.

"Instead of going out and looking for a job, I looked for what I wanted to do," he recalls. "I picked out differ-

ent professions, and instead of going in and asking for a job, I asked them what they did and what their typical day was like, to see if that interested me."

That process included a visit with the manager of the Dover Wastewater Treatment Plant. Intrigued with what he heard, Greig enrolled at what is now Southern Maine Community College and earned a pollution abatement certificate. In 1995 he was hired as a maintenance mechanic at the Newmarket plant; from there he moved up the ranks to his current role, in which he is responsible for the drinking water and wastewater systems.

He has planned and supervised upgrades to the drinking water system that eliminated water shortages, adding two bedrock wells and building a treatment plant for two bedrock wells to adjust pH and remove arsenic using

“Every piece of the plant was critiqued. We had limited funds, so we really had to look hard at how we were going to construct this plant.”

SEAN GREIG

greensand filters (Hungerford & Terry); the state Department of Environmental Services had lowered the arsenic limit to 5 parts per billion.

TARGETING NITROGEN

Greig's most significant project is the comprehensive wastewater treatment facility upgrade completed in 2017. The plant was built in 1969 with primary treatment. A 1985 upgrade added secondary treatment with trickling filters; solids dewatering and influent pump station upgrades took place in 1990 and 1999.

Around 2000 the U.S. EPA began considering effluent nitrogen limits on treatment plants discharging to



The Newmarket Wastewater Treatment Plant (0.85 mgd design, 0.5 mgd average) uses the 4-stage Bardenpho process.



Newmarket (New Hampshire) Wastewater Treatment Facility

newmarketnh.gov/environmental-services-water-sewer-division

BUILT:
1969; latest upgrade 2017

POPULATION SERVED:
8,000

FLOWS:
0.85 mgd design, 0.5 mgd average

TREATMENT LEVEL:
Secondary

TREATMENT PROCESS:
4-stage Bardenpho

RECEIVING WATER:
Lamprey River

BIOSOLIDS PROCESS:
Screw press dewatering

BIOSOLIDS DISPOSITION:
Landfilled

ANNUAL BUDGET:
\$2.9 million

the environmentally sensitive Great Bay estuary. “We knew the trickling filter plant was not working the way it should because of age,” says Greig. “We also knew that trickling filters were not the appropriate technology to meet future permit limits.”

So town leaders worked out an agreement with the EPA to upgrade the facility and secured joint funding from the Clean Water State Revolving Loan fund and U.S. Department of Agriculture Rural Development. Working with the Wright-Pierce engineering firm, the town reviewed multiple upgrade options before selecting the 4-stage Bardenpho secondary process, designed to remove nitrogen with alternating anoxic and aerobic basins.

Before the upgrade, plant effluent contained about 30 mg/L total nitrogen. The current EPA-imposed limit for total nitrogen is a rolling seasonal average 30 pounds per day, equivalent to about 4 mg/L at the plant’s 0.85

**Town of Newmarket Wastewater Treatment Facility
PERMIT AND PERFORMANCE (2023 average)**

	INFLUENT	EFFLUENT	PERMIT
BOD	340 mg/L	5.7 mg/L	30 mg/L
TSS	285 mg/L	3.6 mg/L	30 mg/L
Total N	N/A	13.94 lbs/day	30 lbs/day

good data for the modeling, it’s not going to work. The more you put in, the more you’ll get out. It was a really good collaborative effort.”

Greig’s team includes Todd Gianotti, maintenance supervisor; Sam Hefron, operations supervisor; Kate Preston and James Barlow, wastewater operators; Ben Trottier, water chief operator; and Sue Landale, administrative assistant.

Besides the new secondary treatment process, the plant upgrade included:

- New primary and secondary clarifiers and mechanisms (ClearStream Environmental)
- Conversion of anaerobic digesters to aerated sludge holding tanks
- Headworks upgrade with a Rotamat mechanical fine screen, washer and compactor (HUBER Technology) and TeaCup grit classifier (Hydro International)
- Rotamat screw press (HUBER) for dewatering; polymer blending unit and conveyors
- New effluent flow measurement, disinfection and sampling equipment
- 600 kW diesel standby generator (Generac)
- New control building for administrative offices, lab, aeration blowers (Atlas Copco) and new sludge pumps (KSB and Penn Valley)

“One thing we did when the town council decided to go ahead with the project was try to remove as much I&I as we could,” Greig says. “I knew that I&I would have a major effect on the process, and it was also going to increase costs.”



James Barlow cleans the dewatering press (HUBER Technology).

“Everything we’ve done here is for the long term. Everything we do is designed to put us in the best position for the future.”

SEAN GREIG

TREATING THE FLOW

Raw influent passes through the perforated plate screen and is pumped up to the plant, where grit is removed. At present, the flow bypasses the primary clarifiers and goes directly to secondary treatment basins equipped with fine-bubble diffusers (Sanitaire, a Xylem brand) and KSB mixers).

“We bypass the primaries because we found that primary settling had a negative impact on total nitrogen removal by removing too

mgd design flow. “Based on current operations and influent conditions, we are meeting that limit quite easily,” Greig says. The EPA agreement also encourages the town to help address nonpoint sources of nitrogen.

THE WAR ROOM

The plant’s performance ties back to the design process, which included what Greig calls war room sessions in which he reviewed project details with Wright-Pierce engineers Tim Vadney, Michael Curry and Dave Romilly.

“We’d sit in the room for hours going over the design, layouts, how everything would look, how things would work,” Greig says. “We all had ideas. One day my idea would get shot down. Another day someone else’s idea would get shot down. Or we’d come to a consensus on an idea, but on another day somebody would come up with modification to make it even better.

“Our town staff really worked hard making sure we had good wastewater data to construct the new secondary treatment process. If you don’t have

much of the food needed to optimize the 4-stage Bardenpho process,” says Greig. After secondary clarification, the flow goes through chlorine contact and dechlorination before discharge to the Lamprey River.

The process is monitored by the online IQ SensorNet system (YSI, a Xylem brand). The plant-wide SCADA system was supported by VTScada.

When the plant team began to bypass the primary clarifiers to improve nitrogen reduction, one issue that arose was impact on solids dewatering. The straight waste activated sludge going to the screw press was extremely thin at 0.3 to 0.7% solids, hydraulically limiting the dewatering capacity.

The increased WAS production strained storage capacity, and the dewatered cake was limited to about 19% solids. “I looked around at how we could get our solids thicker,” Greig reports. “We tried decanting in the sludge holding tanks, but that really didn’t work.”

Then, while at WEFTEC, he discovered the S-DISC disc thickener (also HUBER). This compact unit fit existing building space; in two pilot tests it

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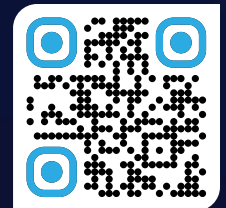
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Sean Greig,
environmental
services director



proved easy to operate. During testing the team used a sludge storage tank as a mixing tank and blended thickened WAS at 4.5% solids with WAS at 0.5% solids to create a feed at 1.5% solids to the screw press. The dewatered cake solids increased to 22-23% solids, saving significantly on hauling costs to the landfill.

“We knew we needed to get our solids thicker,” says Greig. “At some point the landfill will not be the final option. We may have to ship the material to a dryer or some other process, and we have to achieve certain dryness to reduce our cost to haul it to wherever it has to go.”

TO THE TEST

The solids project is just one example of how Greig and his team have approached operating the new plant. They didn’t simply turn it on and run it as designed. “I asked chief of operations Sam Heffron to push this plant one way, and then push it another way, and let it respond,” Greig says.

“The bottom line is I wanted to see not only what the plant could do but what would happen when we did certain things to it. So when things would get upset we could see what was going on and say, ‘Oh, we just need to make this adjustment.’ No matter how much we pushed the plant, it came right back. We couldn’t screw it up.

“Everything we’ve done here is for the long term. That’s an important point that everyone should understand. So many times, things are done for the short term, and that basically puts you in a box. Everything we do is to put us in the best position for the future.”

That includes fostering a capable and cross-trained team: “I ask them when they’re coming up, ‘Do you want to do the same thing day in and day out?’ I empower them to do different things, not to get stuck. If you’re the chief operator, do some maintenance. Do some of this, do some of that. Expand.

“I trust our people to do their jobs. Everybody wants to do the right thing. When you support them, you’re going to have a much happier group.” It pays

THRIVING ON SEPTAGE

As recently as three years ago, the town of Newmarket Wastewater Treatment Facility took in no septage. Now it accepts millions of gallons per year — and the treatment process works better as a result.

In the warm months of July and August the pair of 4-stage Bardenpho treatment trains did not match well with the influent flow if the primary clarifiers were kept offline. “If we ran both secondary trains without primary clarifiers, we had too much tankage online,” says Sean Greig, environmental services director. “But if we took one of the secondary trains offline, we didn’t have enough tankage.”

Furthermore, if the primary clarifiers were bypassed, effluent quality was better, but with a primary clarifier online, solids dewatering improved. So the plant team experimented with bypassing the primaries to optimize solids handling while adding MicroC carbon source (Environmental Operating Solutions) as food for the microorganisms in the aeration basins.

It seemed to be working, but then two years ago, a number of area wastewater treatment plants stopped taking in septage. “We went from receiving no septage to now receiving about 5 million to 6 million gallons per year,” Greig says.

“With the addition of septage we’re actually performing better, especially during summer. We can run our process and still achieve high-quality effluent at all times because we’re not struggling with a lack of food and when ambient temperatures are high. We’re able to keep both trains online by adding the septage while producing effluent total nitrogen as low as 2 mg/L at certain times.”

The heavy screenings and trash loadings in the septage initially caused challenges for the headworks screens, but Greig expects that to be resolved with a new septage receiving station planned for 2024.

“We have one of the best teams in the state. Our team members are cross-trained on everything.”

SEAN GREIG

off in team longevity. Maintenance supervisor Todd Gianotti, for example, has been at the plant since 2001, operations supervisor Heffron since 2003, and water operator Ben Trotter since 2008. Recently retired system technician Joel Drelick worked at the facility from 2003-23.

Greig is also grateful to the town officials for their consistent support: “They are really forward-looking, making sure things are done right for the environment and for clean drinking water. I haven’t had a ‘no’ in I don’t know how many years.”



Kate Preston uses a Hach DR3900 spectrophotometer and a Hach DRB200 incubator for the TNT800 test.



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Todd Gianotti monitors the process on S-DISC sludge thickener (HUBER Technology).

INDUSTRY SERVICE

Meanwhile, Greig gives back through industry organizations. He's a member and past president of the New Hampshire Water Pollution Control Association, and a member and former New Hampshire state director for the New England Water Environment Association.

From 2001-10 he competed with the state team, called the New Hampshire Sewer Snakes in the national Operations Challenge. The team won Division 2 a few times and placed as high as third in Division 1. As for his work for Newmarket, he's not slowing down: "The engineers tell me, 'Sean, look at all the work you've done. You can sit back and relax.' And I say, there's still so much to do." **tpo**

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Being a Sponge

Sophia Oberton, water superintendent/special projects coordinator in Delmar, Maryland

SOPHIA OBERTON EAGERLY ABSORBED KNOWLEDGE FROM TRAINING COURSES AND A SERIES OF MENTORS BUILDING AN AWARD-WINNING CAREER AS A WATER SYSTEM SUPERINTENDENT

STORY: Ted J. Rulseh

Oberton, shown calibrating a Hach universal probe, credits a series of mentors for helping her succeed.



Sophia Oberton came to the town of Delmar water treatment plant with no experience in the water professions.

On becoming water superintendent, she quickly set about improving the facility, deploying SCADA and other technologies to make it more effective and efficient. The secret? In a word, education. She took numerous training classes offered by the Delaware and Maryland Rural Water Associations. She also learned from mentors within and outside her organization.

In particular, she mentions Sara Bynum-King, former town manager, who retired two years ago: “She was always positive in saying, ‘Be a sponge. Learn what you can and push our plant forward.’” After 13 years with the town, nine of them with the public works department and the water treatment plant, Oberton earned a 2023 award for Distinguished Service in Water Treatment from the Chesapeake Sections AWWA.

STRADDLING A STATE LINE

The town of Delmar (population 5,800) is split between Delaware and Maryland. “It’s known as a little town too big for one state,” Oberton says. “We have a town council on the Delaware side, a commission on the Maryland side, two mayors and one town manager.”

The water treatment plant is in Delaware, the wastewater treatment plant in Maryland. Oberton holds Level 4 Water Operator certifications for both states.

Born in Harrisburg, Pennsylvania, Oberton was raised by her grandparents and graduated from high school in Salisbury, Maryland. She earned a bachelor’s degree in health care administration from Sojourner-Douglass College and an MBA from the University of Phoenix.

“We’ve gone from backwashing 47,000 gpd to 23,000 gallons per week, while keeping our water quality top-notch.”

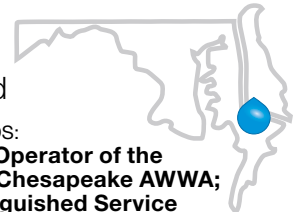
SOPHIA OBERTON

Before coming to Delmar, she worked for more than 20 years in the food service industry, rising to general manager of a restaurant. A single mother, she moved to the public sector out of a desire for work-life balance.

She started as a clerk, first in the town office and then in the public works department. She soon became safety coordinator and then added the role of special projects coordinator: “I was seeing things that had to get done but needed to be pushed along in a faster way.” She stepped in as water superintendent in 2021 after the public works director retired.

Sophia Oberton

Town of Delmar, Delaware/Maryland



POSITION:
Water superintendent /
Special project coordinator

EXPERIENCE:
9 years in the industry

EDUCATION:
MBA, University of Phoenix;
bachelor’s degree, health care
administration, Sojourner-
Douglass College

CERTIFICATION:
Level 4 Water Treatment Operator,
Maryland and Delaware

AWARDS:
2023 Operator of the
Year, Chesapeake AWWA;
Distinguished Service
in Water Treatment Award,
WWOA; and Delaware Water
Operations Specialist of the
Year, DRWA

GOAL:
Elevate the community’s water
quality and sustainability

FOCUS ON QUALITY

The town draws its water from two wells in the Columbia Aquifer. Raw water passes through an aeration tower (Layne) to remove dissolved gases, iron and manganese. It undergoes sand filtration (Lane Enterprises) followed by chlorine disinfection and fluoridation. pH is adjusted to 7.0-7.1 to prevent corrosion of distribution piping. Treatment plant capacity is 550,000 gpd.

The wastewater treatment plant (for which Oberton is not responsible) includes biological and enhanced nutrient removal systems to meet total maximum daily load limits for nitrogen and phosphorus discharges to the Chesapeake Bay. Its design capacity is 850,000 gpd.

As water plant superintendent, Oberton immediately set about upgrading critical water infrastructure with emphasis on deploying cutting-edge technologies and fostering a culture of conservation through sustainable practices.

A COACH FOR LIFE

Town of Delmar water superintendent Sophia Oberton works as a life coach in her spare time.

In her Koach Phee Life Coaching practice (koachphee.com) she helps people of any age and background to achieve their goals and fulfill their potential. The “Phee” is a spinoff from her first name but also stands for Prosperity, Health, Education and Empowerment.

She offers individual and group coaching, motivational speaking and special events such as an annual self-care seminar, given for the fourth time last April on the theme, “Know Your Worth.” She defines self-care broadly. “Things you might not think of are considered self-care because at some point you need these things to make your life fulfilled or to bring you peace and happiness, whatever that looks like for you,” she observes.

“Buying a house is self-care. Having the right job is self-care. The kind of cookies you like is self-care. Many people haven’t dove into what really makes them happy because they’re so busy being people pleasers. I ask a lot of my clients, ‘Can you tell me what makes you happy?’ And they start talking about things that make everyone else happy.”

She applies some of the Koach Phee principles in her role as a superintendent. These include communicating effectively with town staff members and encouraging and motivating people who may be having a not-so-great day.

“I do this by asking the question: What went well?” she says. “We can always complain about how bad the day is, but turning it around and asking what went well makes people remember that they did something right that day.”

Oberton finds rewards in her coaching and can envision devoting more time to it later in life or upon leaving full-time employment: “It would be a peaceful retirement job.”

In 2021 she implemented a SCADA system (Shorite Controls) that has helped improve plant performance and reduce the flow to the wastewater treatment plant. “With this technology, we have been able to save millions of gallons of water per month,” says Oberton. “For example, we’ve gone from backwashing 47,000 gpd to 23,000 gallons per week, while keeping our water quality top-notch.”

She also improved operating efficiency by retrofitting high-efficiency pumps and seeing that public works maintenance people are trained to service them, curtailing reliance on contractors. This year the town will implement a second phase of the SCADA system. “We will have all of our infrastructure connected to SCADA so that we can intimately see the details of flows and pressures throughout the system,” Oberton says. Plans also include adding 360-degree security cameras on top of both water towers.

Meanwhile, Oberton retains her role as special projects coordinator and has spearheaded efforts that include hydrant flushing, pressure gauge testing, cross-connection control, managing compliance with the U.S. EPA Lead-Copper Rule and town beautification.

ALWAYS LEARNING

Mentors have been essential to Oberton’s professional growth. Besides Bynum, she mentions Joe Everett, a recently retired Maryland Rural Water Association circuit rider: “He taught me a lot about different classes, meeting the right people, and making sure my questions were answered or putting me in the right place with the different people.”

“I think every state and every municipality should incorporate an apprenticeship program.”

SOPHIA OBERTON

She’s similarly grateful to Rick Duncan of the Delaware Rural Water Association. She credits Josh Taylor and John McGee of the town’s engineering firm, Davis, Bowen & Friedel, for reliably answering her questions and offering support.

Training classes provided by the state Rural Water Associations propelled Oberton to her water operator certifications and helped her achieve ASSE International cross-connection control certification.



Sophia Oberton earned multiple awards in 2023 including Operator of the Year, Chesapeake AWWA; Distinguished Service in Water Treatment Award, WWOA; and Delaware Water Operations Specialist of the Year, DRWA.



Oberton, shown checking water tower levels using a SCADA panel (Shorite Controls), emphasizes effective communication in dealing with team members.



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“We have to be open to what our team members are saying, because without them, where would we be?”

SOPHIA OBERTON

“The trainings that DRWA and MRWA offer are valuable and impactful,” she says. “They help operators and superintendents like myself run more effective and efficient plants. Going to training helps us continue to expand our knowledge. I research the classes I need to take so that I can bring the information back and push our plant forward.”

PEOPLE PERSON

Improving water operations means working with part-time plant team member Devene Spence and with staff in public works and other town departments. “Clear communication is everything,” says Oberton. “That is where leadership starts.

“Effective communication means talking to people and not at them. It means including them in decisions so that they feel like their position is valuable. Sometimes as leaders we make decisions and expect others just to fall in line. We need to take their suggestions on how things could be done better, versus having them fall on deaf ears. We have to be open to what our team members are saying, because without them, where would we be?”

“One of the biggest fears people have in teaching their knowledge to their staff is that their staff will then take over their position. I am a firm believer in cross-training on everything. If I know it, then my staff needs to know it. Because what happens if one day I’m not here? The plant still has to run, and the organization still has to function. Your team can’t do that if they don’t have the knowledge or the education.”

Oberton strongly supports apprenticeships in the water sector, such as those offered by the DRWA: “I think every state and municipality should incorporate an apprenticeship program.”

Delaware’s is a two-year program that includes classroom instruction along with hands-on experience. The town of Delmar takes on apprentices even though it doesn’t have multiple operator positions available: “If we can start them at our plants and help them flourish and go to other plants, then that is beneficial to our industry.”

Oberton teaches at Delmar High School as part of the pre-apprenticeship program. “It teaches the kids about the types of jobs available for this field,” she says. “In my first year of teaching I asked the kids for their take-aways. One of the biggest was that they didn’t know about all the types of opportunities available to them. I teach at the high school in hopes that maybe one or two students say, ‘I want to go into this field.’” **tpo**



Oberton and Devene Spence, operator, use a Hach SL1000 analyzer to test water samples.

STRESS ON CYBERSECURITY

In July 2021 Sophia Oberton testified before the U.S. Senate Committee on Environment and Public Works during a hearing on “Addressing Cybersecurity Vulnerabilities Facing Our Nation’s Critical Infrastructure.”

She was asked to testify by Rick Duncan of the Delaware Rural Water Association (now retired). “I believe I was chosen because I’m not afraid to speak, and I am very forward-thinking on how we should run our infrastructure and the need to make sure the voices of small rural communities are heard.”

In her own town of Delmar, Maryland, the water and wastewater facilities are monitored by WIN-911 notification software, and network infrastructure set up for cybersecurity with the assistance of outside contractors: “We keep our technology up to date to make sure that nothing can penetrate our plants through any type of hacking.”

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Becoming a Harder Target

DIGITAL TRANSFORMATION IS ESSENTIAL TO MODERN WATER UTILITY OPERATIONS. CONCERNS ABOUT CYBERSECURITY SHOULD NOT BE AN IMPEDIMENT TO ACTION.

By Ted J. Rulseh

Drinking water and wastewater utilities looking to boost reliability and lower cost for customers increasingly look to digital data management and operations.

The hitch: going digital typically means moving to the cloud, and many utilities fear opening their data and critical functions to cyberattacks. The concern is especially acute for smaller utilities that lack staff and expertise to ensure protection against bad actors.

The concern is not unfounded: The U.S. EPA in May issued an Enforcement Alert stating, “The cyberattacks against community water systems are increasing in frequency and severity across the country. Based on actual incidents we know that a cyberattack on a vulnerable water system may allow an adversary to manipulate operational technology, which could cause significant adverse consequences for both the utility and drinking water consumers.”

Specifically, state actors including Cyber Av3ngers (affiliated with the Iranian Government Islamic Revolutionary Guard Corps) and Cyber Army of Russia Reborn have stepped up their cyberattacks.

Nevertheless, concerns about security need not be an obstacle to digital transformation, according to experts on the cybersecurity team at Xylem. Software and analytics solutions for smart water can meet and exceed EPA expectations for cybersecurity in water and wastewater utilities. Cybersecurity is a shared responsibility between utilities and vendors of digital technology, according to the company.

Addressing the issue in an interview with *Treatment Plant Operator* were Damien Hugoo, product security leader, and Seth Werlinsky, director of global product marketing for Xylem Vue powered by GoAigua.

tpo: How does the threat of cyberattacks impede progress on digital transformation?

Hugoo: More digital data can bring greater intelligence to water utilities, but many prefer to keep the data within their perimeter; they are afraid to share it because they are unsure of where their data will go. We have seen that water utilities in general are understaffed and therefore not as well prepared to be secure as, for example, energy utilities. There is an urgency to raise the bar. But while cyber threats have increased, there are ways in which data can be shared with technology vendors to provide intelligence in a secure way.

tpo: Are water utilities of all sizes equally vulnerable?

Hugoo: Smaller utilities are being targeted more than bigger ones because they don't have the same level of staff and may lack awareness of the issues as well as the knowledge, skills and abilities around what to do about potential attacks.

Werlinsky: As more utilities go digital without adequate security measures, bad actors have more places to attack.

tpo: What is the nature of the attacks on water utilities?

Hugoo: The main driver today is ransomware. The attackers get into the network, encrypt some of the data and say, “If you want to get your data back, you have to pay.” Meanwhile the state actors exploit weaknesses in remote access configurations and then use default credentials on devices inside the perimeter.



Damien Hugoo

tpo: What measures can utilities take to limit their vulnerability?

Hugoo: They can start by training their employees, because most of the attacks come through phishing; they are not very complicated. It's about making it harder for intruders to gain access. It starts with moving from very simple to longer or more complex passwords. The next thing is multifactor authentication, which is basically your password followed by a message you receive with a one-time passcode. Then there is federated access, where employees use the same set of credentials when accessing all of an organization's systems. This is convenient and also more secure because there is no need to manage multiple passwords. Starting with these basics, it is not difficult to make progress and increase security.

tpo: How do companies like Xylem help utilities increase cybersecurity?

Hugoo: We provide solutions that enable water utilities to go forward with digital transformation in a secure way. We have experience increasing security within our own enterprise and across products, and we share that expertise with customers. Our goal is to reassure them that when they share data with us to accelerate digital transformation, it doesn't expose them to more risk. In some cases, we may create a cybersecure level they didn't have. For example, every product that we offer is monitored by a product security

“Incidents may happen, and part of being secure is having a capable incident response team.”

DAMIEN HUGOO

incident response team, so that if a weakness is discovered we can coordinate across teams to patch it quickly. In addition, every cloud service we host is monitored 24/7 by a product security operations center that constantly updates automatic detection.

Werlinsky: In our business specifically, we brought to market the Xylem Vue powered by GoAigua software platform, through our partnership with Idrica, an international pioneer in water data, analytics and smart water solutions. The platform allows water and wastewater utilities to visualize and act on data from systems across their network: advanced metering infrastruc-

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ture, lift stations, SCADA, GIS and others. The solution integrates all that data in one place to provide a holistic view of everything that is happening in the network. Our software engineers integrate cybersecurity into the platform versus adding a layer of security. And this is not the only secure digital solution Xylem has — all of our digital solutions require the same level of cybersecurity. We have a global standard that we set for all our products.

tpo: How can a digital solution provider give customers a comfort level with cybersecurity?

Hugoo: They should provide a model for shared responsibility and continuous improvement. They should also present a strong program to align the proposed solution with cybersecurity standards and show how to securely integrate their solution with the utility's operations. That creates a strong foundation for an ongoing cybersecure journey. Most providers that value security, including Xylem, post information about their security program on their public-facing websites.

tpo: What assurance can a digital solution provider give that its own solutions are fully secure?

Hugoo: The solution provider's systems should go through annual testing by security engineers. They should test all existing and newly developed solutions to ensure that they are secure as they are deployed and continue to be secure post-deployment. The provider should also continuously monitor all the software and the cloud environment they manage. That includes threat intelligence and monitoring the dark web for anything that could be compromising the solutions or the clients running them.

tpo: How can a provider instill customer confidence in its ability to deal with incidents such as breaches or outages?

Hugoo: Providers should ensure swift restoration of services. Incidents may happen, and part of being secure is having a capable incident response

“The EPA did an assessment, and last May they issued a statement that over 70% of the water systems in North America do not meet the critical cybersecurity standards.”

DAMIEN HUGOO

team. In our case, we have an incident team available 24/7 that is able to respond rapidly to restore the system, making sure that any interruption is of very short duration.

tpo: What do you see in the future in terms of the nature of cyberattacks?

Hugoo: It's not like two or three years ago when we would see a one-time event in which someone accessed a utility network and changed some settings. The threat today and in the future is real, and it is accelerating. Attackers are targeting water utilities and are not likely to stop until they see them putting up more defenses. If attackers can't get into one utility, they will move on to the next one. Today, we mostly see ransomware, but once attackers are done with that, they will move on to something else. State-sponsored actors will want to disrupt operations. Thankfully to date, we haven't seen that as much.

tpo: Is it possible to quantify the level of threat?

Hugoo: The EPA did an assessment, and last May they issued a statement that over 70% of the water systems in North America do not meet the critical cybersecurity standards. We're going to see more push from the federal government to encourage utilities to follow good cybersecurity practices. We are seeing from the top down an understanding that change is needed. **tpo**



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A Gritty Solution

SELF-LUBRICATING BEARINGS IN A BUCKET-AND-CHAIN GRIT REMOVAL SYSTEM ELIMINATE A SOURCE OF DAMAGE TO A DIGESTER AND OTHER DOWNSTREAM EQUIPMENT

By Eric Ford

It's rare for lightning to strike two people at the same time, but that's what happened when a wastewater supervisor and a plant superintendent were simultaneously flipping through the same trade magazine.

"I ran into my boss's office so fast," recalls Lisa Perry, wastewater supervisor and industrial pretreatment coordinator for the city of Rock Island, Illinois. "I was excited because I had just read about a unique material used in a wastewater treatment plant application, and it struck me as a possible solution to an issue we were dealing with."

PROBLEMATIC GRIT

The plant was experiencing an issue with grit, sand and rocks entering the treatment plant through a combined sewer system. During dry-weather flow the plant processes an average of 6 to 7 mgd.

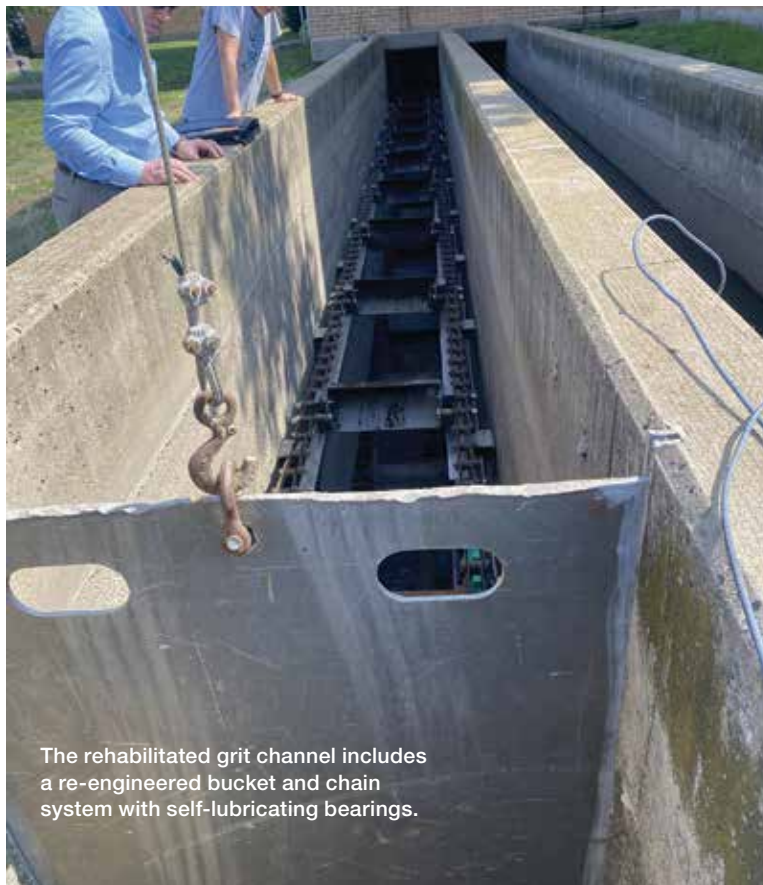
After screening the wastewater enters grit chambers, where the settled and dewatered grit is scooped up by a chain-and-bucket system that deposits the material into a collection system to be hauled to landfill. "We'd been having issues with excessive grit getting into places downstream and causing problems with other equipment," says Perry.

Kirk Staller, Great Lakes Region engineering sales representative for Graphalloy, observes, "Lisa called me and explained that grit was getting through their system and damaging their digester. Lisa has been taking care of that plant for 35 years, having worked her way up through the ranks, and she is dedicated to the plant operating safely and efficiently.

"She is proactive about solutions, and she told me how she read about the Graphalloy solution we provided to a different treatment plant. She asked if we could come to Rock Island to tour the plant and meet with her and the maintenance team."

WALK-AROUND

Staller visited the plant in June 2022 and brought material samples, including a pillow block and a flange block bearing, to share with Perry and her



The rehabilitated grit channel includes a re-engineered bucket and chain system with self-lubricating bearings.

“ Spending money on the Graphalloy material enables us to prevent problems with downstream equipment so we can reallocate maintenance dollars to other important projects.”

LISA PERRY



The Graphalloy solution included new self-lubricating bearings like this one.

colleagues. Perry walked them through the plant and explained that each grit channel had a bucket and chain mechanism with wall-mounted lead bearings that had not been functioning well.

"The lead wall bearings kept seizing up, and lubrication adjustments made with higher-quality lubricants still did not solve the issue," Perry explains. "In fact, the greasing just led to catching even more grit. So when I read that Graphalloy bearings don't seize and don't require lubrication, I wanted to see that special material up close and get my maintenance guys on it."

Once the Graphalloy engineer was on-site, Perry and her crew showed Staller the grit channels. At that point, a collaboration started between the plant maintenance team and the Graphalloy engineering

department. Together, they discussed how to resolve the issue.

"In order to put new bushings in, the maintenance team would have to machine out the lead ones, which was not feasible," says Staller. "So instead of removing the lead bearings, Lisa's team re-engineered how their bucket and chain system worked."

CUSTOM SOLUTION

Perry explains, "My maintenance team had the idea to take a self-lubricating Graphalloy flange block bearing and drill a hole in the flange block so that water could be used to rinse the wall-mounted pieces and get the grit out.



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Old-style bearings that had been installed in the grit channel were removed and replaced.

“We liked that we would no longer have to grease the flange block bearings, which run submerged and would have a constant flush to clear contaminants. We worked back and forth with Graphalloy on what we wanted to try and got their blessing to make the custom alteration to their standard flange block bearing so it would fit what the treatment plant needed.

“The company shipped out 10 nongalling flange block bearings, and my team drilled holes in them to create a solution specifically engineered for our retrofit. My team did a great job installing the new parts over the existing infrastructure in the one grit channel.

“That first channel was converted in January 2023 and worked well for five months, so we ordered 10 more flange block bearings and modified and installed them into the second channel the following June. For over a year now the bearings have worked flawlessly.”

PERFORMANCE PROVEN

Staller and Greg Danilek, engineering sales manager at Graphalloy, visited the Rock Island plant in July 2023 to check on the updated system, which serves a population of 37,000 and growing. “We’re happy to see both channels working well after Lisa’s maintenance team got the parts installed and running,” says Staller.

Perry observes, “We’re pleased with the performance of the parts, and we know they will have a long life span. Just to have the functioning system is invaluable. Now I can concentrate on the digester rehab project knowing that it won’t be in vain.

“Resolving this issue eliminates all the downstream problems we’d been having. Spending money on the Graphalloy material enables us to prevent problems with downstream equipment so we can reallocate maintenance dollars to other important projects.

“In 2024, we’re going to look at using Graphalloy in some other equipment that has hard-to-access bearings. Since we know the material runs reliably, it would be great for our maintenance team if we could service those hard-to-reach bearings less often.”

ABOUT THE AUTHOR

Eric Ford (eric.ford@graphalloy.com) is vice president of sales and marketing with Graphite Metallizing Corp. **tpo**

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1

- 1) Electrochemical oxidation reactors are part of the process that breaks the carbon-fluorine bonds in PFAS molecules.
- 2) A containerized EO reactor system at the West Morgan-East Lawrence (Alabama) Water and Sewer Authority.



2

PFAS: Not Just Treated — Destroyed

AN ELECTRO-OXIDATION PROCESS FROM OVIVO AND E2METRIX BREAKS PFAS MOLECULES APART, PROVIDING A PERMANENT TREATMENT SOLUTION

By Ted J. Rulseh

Traditional approaches to PFAS treatment like reverse osmosis and adsorption media like granular activated carbon do not eliminate the risk of contamination.

That's because they transfer the "forever chemicals" from the water being treated to a concentrated waste stream that still must be managed. That leaves the possibility of PFAS being re-released. At the same time, disposal and replacement of adsorption media carries significant operating costs.

Now the Ovivo water treatment company has acquired E2metrix, a specialist in innovative and clean electro-technologies, to create a solution that treats and destroys PFAS and other emerging contaminants found in water and wastewater.

During pilot testing at Alabama's West Morgan-East Lawrence Water and Sewer Authority, the technology achieved 99% reduction of PFOS and PFOA and more than 85% reduction of total detectable PFAS in the water treated, according to Ovivo. The process does not simply remove PFAS; it mineralizes them into their harmless elemental parts.

The electrochemical oxidation solution is being tested in applications including drinking water, municipal and industrial wastewater, and landfill leachate. In the process, an electric current is continuously passed through the water in process reactors.

Specialized electrodes enable direct and indirect oxidation of the PFAS, permanently destroying the chemicals by breaking their carbon-fluorine bonds. Katie Henderson, product group manager for PFAS Solutions with Ovivo, and Ihsen Ben Salah, general manager of E2metrix, talked about the technology in an interview with *Treatment Plant Operator*.

tpo: What was the motive for developing and introducing this technology?

Ben Salah: For the past eight years, we have been pioneers in addressing emerging contaminants, and for the past five years we have been on the

“The approach uses an advanced and economical electro-oxidation process that we can also apply to other persistent organic compounds in municipal water and wastewater.”

IHSEN BEN SALAH

forefront of addressing PFAS compounds. In light of the increasing urgency to provide a definitive solution for these persistent forever chemicals, it became a priority to address them with an on-site destruction solution, as opposed to conventional technologies such as activated carbon.

tpo: How did your two companies devise this method of treatment?

Henderson: Electrochemical treatment has been around for decades. Its application for PFAS destruction is relatively new. E2metrix has been working for several years on optimizing their reactor. What is different for PFAS is the type of electrode used. We select an electrode that is able to break down the carbon-fluorine bonds that characterize PFAS. Our approach is not to shift the problem around by removing PFAS and putting it in a landfill, but to actually destroy it. We believe that minimizing the amount of what will soon be designated as hazardous waste on site will reduce overall cost and also reduce liability for those handling these waste streams — especially for municipalities.

tpo: In basic terms, how does the treatment process function?

Ben Salah: Electrochemical destruction mineralizes PFAS by direct oxidation. It uses electricity to cleave the carbon-fluorine bonds and break the molecules down into their elemental parts of carbon and fluorine. We

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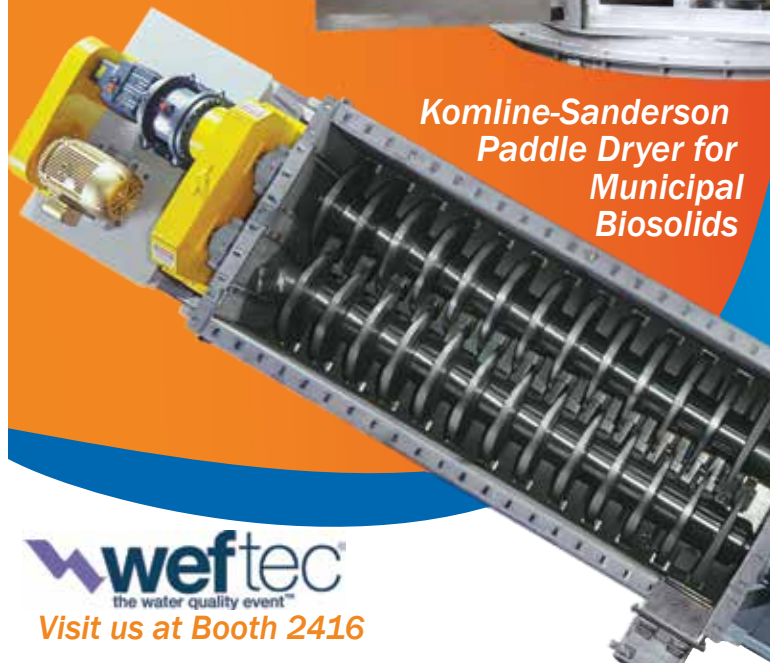
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use an electrode, and specifically an anode, with an extended useful life. Different electrode combinations are used depending on the compounds to be addressed. The approach uses an advanced and economical electro-oxidation process that we can also apply to other persistent organic compounds in municipal water and wastewater.

tpo: What are the mechanics by which PFAS molecules are targeted and broken down?

Henderson: The main feature that initiates the destruction process is direct electron transfer at the surfaces of the electrodes. We bring in the water to be treated into a reactor and create a thoroughly mixed environment to increase contact between the water with the electrodes, and so optimize electricity usage. We typically have multiple reactors in series or in parallel to achieve the desired treatment goal and flow.

“We see this as an on-and-off, easy-to-operate system. Once we have dialed how many reactors they need, they can just turn it on and let it run.”

KATIE HENDERSON

tpo: Is it necessary to analyze the waste stream before deploying the technology?

Henderson: Yes. Any technology for treating PFAS needs to go through a pilot demonstration. We only measure 36 PFAS compounds, and there are thousands of such compounds out there. Our team is focused on offering municipalities a technology that is a good fit, so that we're treating not just the compounds we can measure, but all the PFAS compounds that are in the waste stream.

tpo: Is electrochemical oxidation a standalone technology, or is it part of a larger process?

Henderson: Given that carbon-fluorine bonds are among the strongest in organic chemistry, breaking them down is energy-intensive. So concentrating the PFAS into a smaller treatment volume is necessary to reduce electricity consumption and cost. We deploy an integrated treatment approach. At our demonstration sites we have been using reverse osmosis to concentrate PFAS; we then treat the RO concentrate stream. We're also looking at foam fractionation and regenerable ion exchange for concentration. These are all technologies that can fit readily into the industrial and municipal markets.

tpo: What capacities can this destruction technology achieve?

Ben Salah: It is a modular system, so we conduct batch and pilot testing to determine the optimal treatment time with the required flow, as well as the choice of electrodes. We then decide how many reactors are needed in series or in parallel to treat the flow. If the flow is not continuous, our technology can be operated in a batch configuration.

tpo: Is there a lower or upper limit on the process capacity?

Henderson: There are no limits. Even if a user's flow is very small, we would simply operate the system in a batch configuration with the smallest unit we have.

tpo: How is the technology delivered to end users?

Henderson: Our offering is very flexible. We can work with the client to build it on site, or we can bring it in a container, put it in a building, and teach them how to run it. We see this as an on-and-off, easy-to-operate system. Once we have dialed how many reactors they need, they can just turn it on and let it run. It operates at low or no pressure and at ambient temperature, so it is a very safe system. We use nonsacrificial electrodes that should last the life of the equipment, which means the amount of maintenance is very low.

tpo: Does the water leaving the reactor require any special handling or treatment?

Henderson: We treat the effluent coming from a municipal or industrial treatment plant, and we usually recommend a polishing step, such as granular activated carbon or ion exchange, to make sure we remove any PFAS that may remain. The media life will be very long because our process has destroyed the majority of the PFAS mass.

tpo: How was this treatment method proven for commercialization?

Ben Salah: The electrode destruction technology has been commercialized since 2015 for different applications including ammonia nitrogen elimination and destruction in mining, municipal wastewater treatment, and cooling tower water disinfection. We have delivered more than 200 reactors to sites in Canada. **tpo**



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Clarifiers, Digesters, Water Towers, Structures and Components

By Craig Mandli

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Spiraflo clarifier from Lakeside

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wastewater

Efficient screening system features modular components

By Craig Mandli

Your screening equipment plays a huge role in your wastewater system as the first line of defense to the filtration process. When removing objects such as rags, paper, plastics and metals, screening equipment prevents damage and clogging of downstream equipment.

An efficient screening system saves on labor, keeps the treatment process flowing smoothly, and protects downstream equipment against fouling, unnecessary maintenance and potential damage. **JWC Environmental's Auger Monster ALT** is the company's newest screen, billed as an all-in-one solution for screening, washing, dewatering, compacting and conveying.

The ALT is the latest evolution to the Auger Monster product line. According to Stephanie Jeffers, senior marketing manager for JWC Environmental, when combined with the company's Muffin Monster or Channel Monster dual-shafted grinders, The ALT effectively removes wastewater solids. She says the device is well suited for plants 10 mgd and smaller, enabling them to avoid the cost of installing a bar or perforated plate screen along with a washer/compactor.

"Our business development manager, sales team and channel partners coordinated efforts to bring voice of customer feedback to the product development team," she says. "The close connection those groups maintain with our end customers was vital to understanding why they love the original Auger

Auger Monster ALT from JWC Environmental



Monster models and identifying opportunities to solve additional screening challenges they face."

The ALT operates in a manner similar to previous designs. A perforated screening trough captures solids, which are then removed and sent up an incline by a shaftless spiral auger. The debris is washed, and separated organic material is directed back to the headworks. Excess water drains by gravity. The unit can be installed with minimal construction or infrastructure changes. Modular brush sections are available in three styles for ease of replacing only worn sections. In addition, single-sided positioning of spray bars above the waterline in the screen trough decreases water use. The spiral auger is offered in traditional steel, but according to Jeffers, customers indicated that stainless steel is a valued option. JWC can now supply the screw in 304 stainless, and by special request in 316 stainless.

"The ALT model reflects industry needs to manage maintenance time and expense, employ smarter water use, and leverage constrained existing treatment plant footprints," says Jeffers. 800-331-2277; www.jwce.com

loads — yet durable enough for industry's most demanding applications. The hoists feature fully enclosed gearing; a fully machined lift wheel; a weather-proof holding brake; roller bearings on all gears and shafts; and forged stainless steel hooks with safety latches. Chain hoists, like the trolleys, are available in 1/2-, 1- and 2-ton capacities. The stainless push beam trolley fits most I, S and W beams and has precision ball-bearing trolley wheels. The beam clamps are available in 1- and 2-ton capacities. All products in the line are made from 304 stainless steel and come with individual test certificates and serial numbers.

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Milton Roy's new Primeroyal Q series (PQ) chemical metering pump serves a wide array of industrial applications. The PQ series boasts an extensive and modular API 675 range that includes eight distinct drive sizes and nine advanced liquid end technologies, ensuring unparalleled versatility and the ability to meet the most demanding hydraulic performance requirements for

high flows and high discharge pressures. It offers a maximum flow rate of 2,199 gph per dosing head and maximum discharge pressure of 15,011 psi. The Primeroyal Q series has been engineered with three proven liquid end types — packed plunger, PTFE or metallic diaphragm.

877-786-7298; www.miltonroy.com



Vortab VIP flow conditioner

The Vortab Insertion Panel flow conditioner features a unique design that maximizes flowmeter performance with minimal pressure drop

in a simple to install, lightweight thin panel design that overcomes turbulent pipe flow profiles. The Model VIP blends the performance and superior low pressure drop of Vortab tab-type flow conditioning technology with the low cost and ease-of-installation of an insertion panel type flow conditioner solution. Vortab tab-type flow conditioning technology greatly reduces the pressure drop compared to alternative technologies such as tube bundles, screens and perforated plates. The standard Model VIP Flow Conditioner is manufactured of 316 L stainless steel in sizes for installation in pipes from 2 to 40 inch diameters. **800-854-9959; www.vortab.com**



Kohler Energy Power Systems KD Series generators

Power Systems, part of Kohler Energy, has continued the evolution of its KD Series generators with enhanced engine designs that offer improved generator performance, reduced emissions and future-readiness for alternative fuels. The design upgrade for the KD62V12A and KD83V16A engines means generators from the KD2000 to the KD3750 will benefit from improved transient performance, lower NOx, and a weight reduction of around 2,000 pounds. The engine control unit has been moved from the front to the side of the engines for easier access, and the redundant starter configuration has been optimized. These changes support more streamlined generator servicing and reduce the total cost of ownership across the life cycle.

800-544-2444;
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captures ultra-fine grit particles down to 75 microns, offering performance across all flow conditions. With nine unit model capacities ranging from 0.5 to 50 mgd, it boasts a large ultra-fine grit chamber and single-unit model capacity. The system combines the power of proven particle capture methods: enhanced settling by inclined plates meeting a defined surface overflow rate with established hydraulic forced vortex technology to achieve 95% grit removal efficiency down to 75-micron particles across all flows. The powerful combination consistently yields industry-best removal efficiency during low flow, average daily flow and peak flow conditions. Performance is not derated even for wet weather events, which can bring as much as 40 times the normal grit load.

800-898-9122;
www.smithandloveless.com



Warren Controls Series 2900 industrial control valves

Warren Controls' Series 2900 industrial control valves are ideal for wastewater applications with moderate pressure drops and temperatures from minus 20 to 400 degrees F. The valves feature rugged cast iron bodies and are available in a variety of trim materials, including bronze, 300 stainless steel, 17-4 pH stainless steel, and Alloy 6 (cobalt-chromium-tungsten). Available valve body styles include two-way single seat unbalanced, two-way cylinder balanced, 2-way double seat balanced, three-way mixing, and three-way diverting. The equal percentage and linear plugs in the two-way valves and linear plugs in the three-way valves provide excellent modulating control of a wide variety of fluids. The Series 2900 is ideally suited for applications in which value and long life are important objectives.

800-922-0085;
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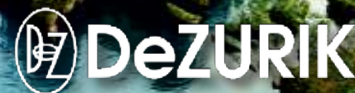
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Stainless steel lever hoist fit for treatment plants

By Craig Mandli

Billions of dollars in corrosion damage occurs in water and wastewater handling systems each year. Much of that is due to corrosion damage that occurs in treatment plants. These plants process some of the most aggressive and corrosive liquids to travel through any piping system, and the resulting corrosion remains an ongoing problem. That's why manufacturers are turning to corrosion-resistant materials for infrastructure upgrades.

To that end, **OZ Lifting Products** recently launched North America's first **stainless steel lever hoist**. The hoist is available in 0.25-, 0.75-, 1.5-, and 3-ton versions; and each one can be provided with 5, 10, 15 and 20-foot lengths of lift, but custom rigging is available.

"We have seen the stainless steel lever hoists handle lifting pumps and ancillary equipment," says Ashley Blum, marketing manager for OZ Lifting Products. "Lever hoists are used for handling pumps, valves, and other tools during installation, maintenance, or replacement. Their compact size allows for maneuverability in tight spaces, often found around treatment tanks or pump stations."

According to Blum, Type 304 is widely accepted as the most versatile stainless steel, which is why it is commonly the manufacturing product of choice for use in corrosive environments. The smooth, nonporous surface makes it easier to clean and maintain, which is especially important in environments where hygiene is a concern.

"Due to constant moisture and potential exposure to harsh chemicals, stainless steel lever hoists are preferred tools in this sector. Many tanks and access points in wastewater treatment facilities have heavy lids, and lever hoists can be used to safely and efficiently remove them for inspection or cleaning," she says. "They are all used for machinery installation and repair. During handling of mixers or clarifiers, lever hoists can be used to lift and position components."

Other key features include a free wheel for quick adjustment; 360-degree handle rotation; and a Weston-style brake system. They are supplied with forged hooks and stainless steel riveted identification tags. Blum also pointed to the twin-pawl design; sealed roller bearing; and rubber grip.

"We received high prelaunch demand," she says. "Customers across various industries expressed strong interest through customer service calls, trade shows, and email inquiries. This indicates a long-standing need for this product in the market." **800-749-1064; www.ozliftingproducts.com**



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Suspended air flotation helps farm overcome treatment challenges

Problem

Chicken producer Fieldale Farms in Baldwin, Georgia faced an expansion that overwhelmed its wastewater treatment system. Designed for 800 gpm, it was operating at 900 gpm. Space constraints made adding a new dissolved air flotation unit impractical.

Solution

The company selected a **suspended air flotation system** from **Heron Innovators**. The conversion involved disconnecting air compressors, turning off pumps, removing lamella plates and installing SAF generators and clear mixers while using existing tanks. The systems increased capacity from 900 to 1,500 gpm per tank.



RESULT:

TSS levels dropped from 150 to 70 ppm using 50% less polymer. The system proved easier to operate and maintain, handling shocks such as a 300-gallon peracetic acid spill, with minimal disruption. **916-408-6601; www.suspendedair.com**

Clarifier enables plant to efficiently treat wet weather influent

Problem

The Fourth Creek Wastewater Treatment Plant, owned by the Knoxville Utilities Board, was built as an activated sludge facility with blending to handle peak flows. The board wanted to eliminate blending and provide full biological treatment for all flows. The utility also wanted greater treatment flexibility in a relatively short process time while maintaining a compact footprint.

Solution

The upgrade used plant grounds where there had been unused tankage. The phased approach converted a dual-train 9.5 mgd ACTIFLO system to the **BIOACTIFLO system** from **Veolia Water Technologies**, a high rate clarifier that includes a biological solids contact tank that can be incorporated to improve soluble BOD removal. A small stream of return activated sludge is borrowed from the secondary system and combined with the peak excess flows within the solids contact tank. A targeted MLSS concentration is maintained in the contact tank to facilitate rapid uptake of soluble BOD via contact stabilization. Clarification follows, producing high TSS and BOD removal.



RESULT:

The system has proven reliable for handling peak flows. The clarification process and the ability to remove soluble and insoluble BOD in a short detention time met regulatory standards and is easy to operate. It was tested in 2018 and 2019 when the area received record rainfall and widespread flooding. The utility treated over 4 billion gallons of water during the event; the BIOACTIFLO process helped the plant handle the load and remain in compliance. **919-677-8310; www.veoliawatertech.com**



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Problem

A Midwestern municipal sewerage district faced issues with its acid-phase steam injector units, including frequent plugging with foreign materials, high labor and parts costs, and disruptions to the digestion process.

Solution

District staff turned to **Hydro-Thermal**, a manufacturer of direct steam injection heaters, for an unrestricted flow solution called the **Non-Obstructive Heater**. It allows larger solids to pass through without causing blockages. The replacement units fit the original footprint with minimal piping modifications.



RESULT:

The solution significantly reduced plugging and emergency work disruptions while optimizing the acid digestion process. This reduced labor and maintenance costs. **800-952-0121; www.hydro-thermal.com** tpo

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Nidec/US MOTORS announces two senior staff promotions

Nidec's US MOTORS division promoted two longtime staffers to senior roles. Cory Kniepp is now director, strategic planning and marketing operations, and Patrick Hogg is senior marketing director, industrial OEMs and distribution. In his new role, Kniepp will support growth initiatives, collaborating with senior management in shaping business strategy and conducting data analysis to ensure continued alignment with goals. Hogg will continue to lead the company's industrial pumping, distribution and general industry markets, along with a stronger focus on business development for these and other growing markets in the industrial segment.



Cory Kniepp Patrick Hogg

Blackline Safety expands in utility sector with new \$1.5 million deal

Blackline Safety has signed a new contract to provide G7c devices and services to a major U.S. utility provider based in California. The contract, a collaboration between Blackline Safety and one of its U.S. channel partners, is valued at more than \$1.5 million. The utility provider has already started rolling out the devices across their organization. The wearable G7c has features such as SOS latch, fall and no motion detection and real-time connectivity, providing a critical lifeline in case of emergency.

Kurita America and Solugen announce partnership

Kurita America, part of the Kurita Group, announced a collaboration with Solugen, a bio-based chemical manufacturer, to develop a suite of new carbon-negative water treatment products. These solutions will introduce high-performing, bio-based substitutes to phosphorus and other petroleum derived additives currently on the market.

AWWA awarded EPA grant to bolster water workforce leadership

The U.S. Environmental Protection Agency has awarded the American Water Works Association a \$852,000 grant to support the Transformative Water Leadership Academy, a collaborative effort between AWWA and Water-Now Alliance that cultivates and develops the next generation of water utility leaders. The TWLA's 10-month, cohort-based experiential leadership development program prepares water leaders to address emerging water challenges through the foundations of sustainable community leadership.

SIMFLO names two new sales directors

Greg Hebert, SIMFLO's new director of sales for its engineered products group, will be responsible for leading the company's outside sales team, covering the municipal, industrial and commercial markets. Hebert previously served as regional sales manager — engineered products group for SIMFLO.



Greg Hebert Archie Beard

SIMFLO also announced the appointment of Archie Beard as director of sales for its standard products group. In this role, With over 40 years' experience, Beard will spearhead the sales strategy and execution for SIMFLO's standard products group, driving revenue growth across the company's standard products segment.

ResinTech expands New Jersey headquarters

ResinTech has begun a significant expansion to its Camden, New Jersey headquarters. The company has awarded the expansion contract to Penntex Construction, a move aimed at bolstering production capacity for its premium quality U.S. resin and filter manufacturing, as well as the burgeoning lab services business. This strategic move, coming just over two years after the company's move into the new facility, adds 30,000 square feet to the existing 186,000-square-foot factory. **tpo**

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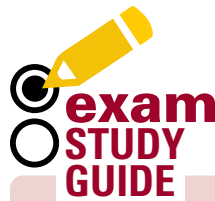
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WASTEWATER

By Rick Lallish

What type of activated sludge treatment process is used when the influent is considered nutrient deficient?

- A. Kraus process
- B. Al West method
- C. Membrane bioreactors
- D. High-purity oxygen


ANSWER: A. The Kraus process is used when the wastewater is nutrient deficient or has a greater ratio of carbonaceous to nitrogenous materials. This is usually found in dairy or cannery operations. It is a modification of a conventional activated sludge process and uses a portion of the anaerobic digester supernatant to supplement the nutrients needed for the activated sludge process. Other benefits of the Kraus process are increased sludge settleability and a ready supply of organisms. More information may be found in the CSU-Sacramento textbook: *Operation of Wastewater Treatment Plants*, Volume 1, Eighth edition, Chapter 5.

classifieds **October 2024**



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DRINKING WATER

By Drew Hoelscher

What type of joint would not be used in buried distribution system piping?

- A. Push-on joint
- B. Flanged joint
- C. Mechanical joint
- D. Welded joint

ANSWER: B. Many types of materials are used in water distribution systems, and that means many types of joints for connecting pipe. Flanged joints are most often used where piping is above grade. Flanged joints are not typically found in buried pipe due to the lack of flexing, in case the ground experiences shifting.

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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Presenter:



Matthew Roegner
Product Manager, Xylem

Matthew Roegner is a Product Manager at Xylem. He works to drive alignment to customer needs, improve end-product quality, and execute product development for technologies under Xylem’s DAVCO™ brand (formerly Evoqua) which include Field Erected Treatment Plants, disc filtration, gravity sand filtration, screw pumps and more.

Matthew has a career background spanning a variety of wastewater treatment technology offerings such as membranes, circular clarifiers, sand filters, and turnkey biological treatment systems. From pilot testing to exploring market needs, Matthew looks to bridge the gap between the customer and equipment manufacturer.

people/awards

The **Forest Park Water Treatment Plant**, jointly owned and operated by North Penn and North Wales (Pennsylvania) water authorities, attained the Area-Wide Optimization Program Award for the 17th year in a row.

The **Aquia and Little Falls Run wastewater treatment facilities** in Stafford, Virginia, received 2023 Platinum Peak Performance Awards from the National Association of Clean Water Agencies.

Professor **Amy Pruden** of Virginia Tech received the 2024 ISME/IWA BioCluster Award Grand Prize from the International Water Association, in collaboration with the International Society for Microbial Ecology. The award recognizes the importance of interdisciplinary research at the interface of microbial ecology, water and wastewater treatment and engineering sciences. Dr. Ryan Ziels, associate professor of civil engineering at the University of British Columbia, received the Rising Star Prize.

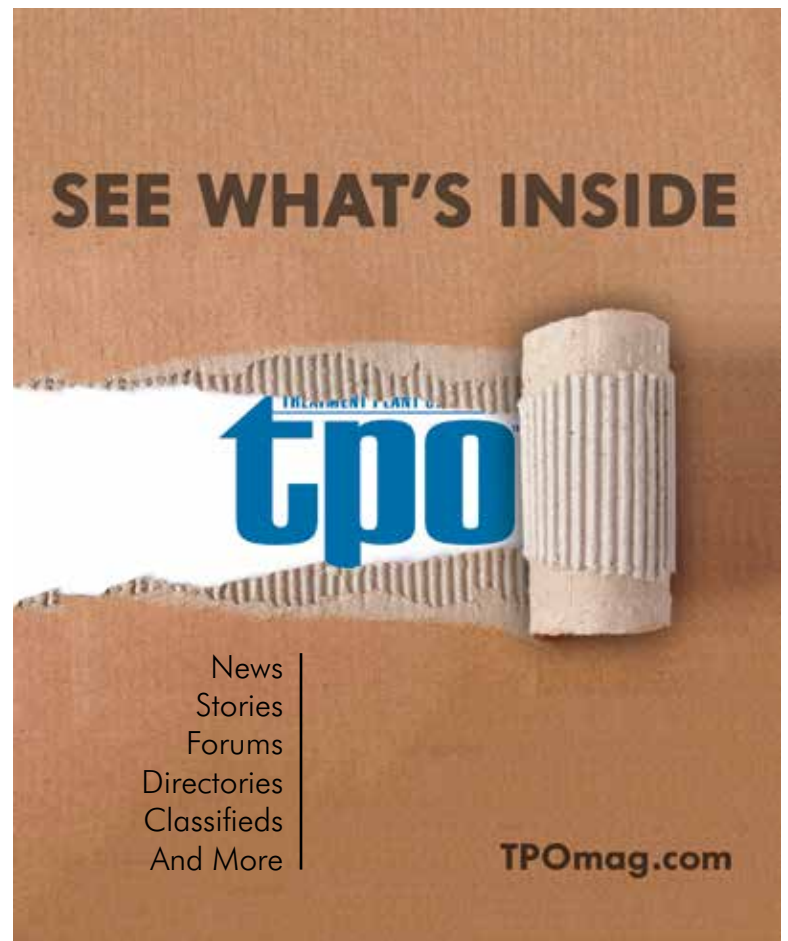
Cape Fear Public Utility Authority in Wilmington, North Carolina, received the Water Research Foundation's 2024 Subscriber Impact Award for contributions to research on treating drinking water for PFAS.

Santa Clarita Valley (California) Water renamed its Rio Vista Water Treatment Plant as the E. G. "Jerry" Gladbach Water Treatment Plant. The late Gladbach served on the SCV Water board of directors and its predecessor, the Castaic Lake Water Agency, from 1985 until his passing in July 2022.

Cheryl Porter, chief operating officer of water and field services for the Great Lakes Water Authority, began her one-year term as AWWA president.

Steve Davis, president of Columbus (Georgia) Water Works announced his retirement effective in October.

A \$124 million expansion and upgrade of the **Fargo (North Dakota) Regional Water Reclamation Facility** took top honors in the 2023 Sherwin-Williams Impact Award program.



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events

Oct. 2

AWWA Closing the US Water and Sanitation Infrastructure Gap webinar. Visit www.awwa.org.

Oct. 4

Delaware Rural Water Association 16th Annual Water & Wastewater Operators Expo, Greenwood Volunteer Fire Company. Visit www.drwa.org.

Oct. 7-9

Virginia Section AWWA 34th Annual Water Distribution Seminar and Utility Rodeo, Quality Suites Lake Wright - Norfolk Airport. Visit www.vaawwa.org.

Oct. 13-15

Southwest Section AWWA Annual Conference, Embassy Suites by Hilton Norman (Oklahoma) Hotel & Conference Center. Visit www.swawwa.org.

Oct. 14-16

North Dakota Section AWWA Annual Conference, Alerus Center, Grand Forks. Visit www.awwand.org.

Oct. 21-24

California/Nevada AWWA AFC24, Atlantis Resort/Sparks Convention Center, Reno. Visit www.ca-nv-awwa.org.

Oct. 22-23

Alaska Water Wastewater Management Association Southeast Alaska Operator Training Conference, Sitka Centennial Hall. awwma.org/events/EventDetails.aspx?id=1863226. Visit www.awwma.org.

Oct. 23

AWWA From 2024 to 2050: Community Engagement & Empowerment (Water2050) webinar. Visit www.awwa.org.

Oct. 23-24

New Jersey Water Association 2024 Management & Technical Conference, The Golden Nugget - Atlantic City. Visit www.njwater.org.

Oct. 23-25

Iowa Section AWWA Annual Conference, Hyatt Regency Coralville. Visit www.awwa-ia.org.

Oct. 24

New Hampshire Drinking Water Expo & Trade Show, Grappone Conference Center at Courtyard by Marriott, Concord. Visit www.nhwwa.org.

Oct. 28-30

2024 Water Environment Association of South Carolina Operator Conference Embassy Suites by Hilton Myrtle Beach. Visit www.scwaters.org.

Oct. 28-30

Georgia Rural Water Association Fall Conference, Unicoi State Park & Lodge, Helen. Visit www.grwa.org.

Oct. 30

AWWA Compensation Survey Insights and Action Steps webinar. Visit www.awwa.org.

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