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Jamie Kreller
Superintendent
Suffield, Conn.



The Atlas Copco logo is positioned in the top right corner, featuring the brand name in a white serif font within a blue rectangular box that has white horizontal bars above and below the text.The background image shows an outdoor industrial facility, likely a wastewater treatment plant. In the foreground, two large, dark grey metal cabinets are protected by a large, translucent dome with a glowing green hexagonal grid pattern. A glowing blue padlock icon is centered between the two cabinets. In the background, there are various industrial structures, pipes, and a clear blue sky.

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ON THE COVER: Jamie Kreller is used to overcoming challenges, professional and personal. As superintendent at the Suffield (Connecticut) Water Pollution Control Authority, he has had to address deteriorating infrastructure, use in-house expertise wherever possible to save money, and prepare for new contaminants and tightening regulations, all despite a lifelong battle with post-traumatic stress disorder. (Photography by John Marinelli)

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The Value of the PO Credential

Thank you so much for writing about the Professional Operator certification (*TPO*, September 2023, Let's Be Clear, "Where Are All the POs?"). I was one of the first Class 4 operators in the program, and I was excited to finally have some comfort in knowing that I wouldn't be limited forever to my home state of Ohio. The promise of easy reciprocity sounded great, and I appreciated the consistency and authenticity of the test.

I am not an engineer, and I don't aspire to become one. One of the greatest pieces of advice I got when I came up through the ranks was: Find something you're good at and be the best at it; don't try to fit a mold you don't belong in.

Specifically, they were encouraging me to recognize that being an operator is as good as being a P.E./engineer — just different. I have since moved into my dream job at Jacobs. I travel the world doing startups, troubleshooting, design review and staff augmentation for wastewater treatment plants as an operator. The challenges and solutions I use are certainly represented in the certification process through the PO program.

However, I haven't been able to receive any direct reciprocity due to my PO4 certification. I have been able to get it, but I have to provide the same mountain of paperwork to each state and sometimes still have to go back and take some version of the exam.

My guess is that the (understandable) desire to hold operators to a higher standard in each state leaves us with minimal consistency and focuses on the bureaucracy that has been used in the past as a justification for the future.

My hope is that by continuing to include PO on my business cards, wearing my PO pins at conferences and talking about the program, more people will become comfortable with the idea that this is the certification of the future, and that it provides measurable demonstrations of qualifications, no matter which state you live in.

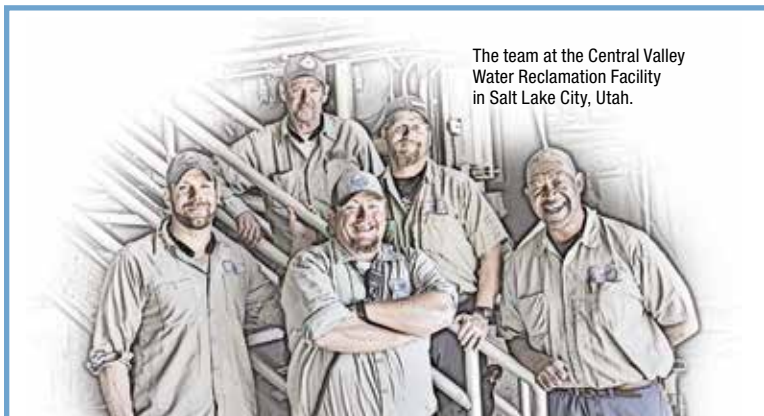
Sincerely,

Christen Wood, PO4
Operations Specialist, Jacobs

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Nerves Are Your Friends

WHEN TAKING AN EXAM, DOING A JOB INTERVIEW, OR FACED WITH ANY CHALLENGING SITUATION, DON'T FEAR NERVOUSNESS. IT CAN HELP BRING OUT YOUR BEST PERFORMANCE.

By Ted J. Rulseh, Editor



Late in my senior year of college I was seeking a summer internship at the local daily newspaper. For help in preparing for the interview I turned to the head of the college's placement office, and he gave me a piece of advice I have never forgotten. He said, "Don't worry about being nervous. If you're not nervous, you're not up."

Yes, I was nervous for the interview, and yes, I did well, and yes, I got the position. And ever since then when faced with a challenge, instead of trying to calm

the inevitable case of jitters, I embrace it. And it has helped me every time, even though the outcome wasn't always what I hoped for.

ON A CURVE

If you need a more authoritative voice on the value of nervousness, consider one of my brothers-in-law, an Olympic-medal-winning speed skater. He maintains that the relationship between nerves and performance shows on a graph as a bell curve.

If we're not nervous at all, our performance will be flat. But if we're too nervous, we'll be prone to mistakes and even panic under pressure. We want to be keyed up just enough to let our bodies' biochemistry — dopamine, adrenaline and other mysterious substances — work on our behalf.

Actually, my brother-in-law was invoking the Yerkes-Dodson Law, posited by two psychologists more than 100 years ago. It states that mental or physiological arousal enhances performance — up to a point beyond which the arousal becomes too high and performance declines.

SEEKING GOLDFLOCKS

So at exam or interview time, how can you find that sweet spot of nervousness at the apex of the bell curve? Experts offer a few words of highly practical advice. For one thing, get a good night's sleep before the event. For another, lay off the coffee and other caffeine sources. Your body will be stimulated enough on its own; adding a chemical stimulant might push you into the zone of excess anxiety.

On a more esoteric level, some researchers recommend rethinking performance anxiety, looking upon it as excitement, a much more positive attribute. According to an article in *Psychology Today*,^[1] the most recent science "suggests that emotions are constructions we actively participate in creating. We feel a sensation, run it past our experiences and vocabulary, and in choosing a label, actually construct the emotion we experience."

The article cites Alison Brooks, a Harvard Business School professor, who went farther with that concept: "She found that participants who simply reappraised their performance anxiety as excitement felt significantly less distress than those who did not."

BEING PREPARED

Of course, nervousness alone will not ensure a successful performance. It's the marriage of nervousness and preparation that creates a force to be

reckoned with. In my capacity as a book author I recently had to give a keynote presentation to an audience of some 250 at a state conference of advocates for lake protection.

It was a much larger stage than I was used to, in front of accomplished people whose expectations would be high. I had put the presentation together in the weeks before the event, and I had given similar talks before, but still I was worried.

We want to be keyed up just enough to let our bodies' biochemistry — dopamine, adrenaline and other mysterious substances — work on our behalf.

So in my hotel room on the two nights before my talk, I brought up the slides on my computer and went through the entire program, out loud, just as if a roomful of people were listening. I did my fumbling and stumbling (and there was plenty of both) in private.

So, when I stepped up to the podium and microphone, yes, I had the jitters. But I also felt energized and excited. I gave the presentation smoothly and with conviction, and the response was excellent. It reminded me of other times in my

life when nerves helped bring out my best.

It's a lesson worth remembering: In our trying times, when the stakes are the highest, nervousness can be our friend.

^[1] Clark, Alicia H., Psy. D, "7 Ways to Use Anxiety to Improve Performance: Research continues to link moderate anxiety to optimal performance." *Psychology Today*, December 18, 2018. **tpo**



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Published monthly by COLE Publishing, Inc.
P.O. Box 220, Three Lakes, WI 54562

In U.S. or Canada call toll free 800-257-7222
Mon.-Fri., 7:30 a.m.-5 p.m. CST

Website: www.tpomag.com / Email: info@tpomag.com / Fax: 715-350-8456

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EDITORIAL CORRESPONDENCE: Address to Editor, TPO, P.O. Box 220, Three Lakes, WI 54562 or email editor@tpomag.com.

DIGITAL REPRINTS AND BACK ISSUES: Visit www.tpomag.com for digital reprint options and pricing. To order back issues, call Holly at 800-257-7222 or email holly.gensler@colepublishing.com.



CONTROLLED CIRCULATION: 60,500 per month



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ALGAL BLOOMS

Scientists Test Monitoring Tool

Typically, NASA would need clear skies to use satellites to detect algal blooms from space. But a recent study has shown how a space-based instrument was able to peer through thin clouds to uncover powerful clues about *Karenia brevis*, the microscopic algae responsible for the 2020 algal blooms along Florida's west coast.

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Truck driver Jose Garcia offloads industrial food waste (leftovers from beer and fruit juice making) at the Victor Valley Wastewater Reclamation Authority's biogas production facility.

Food to Fuel

VICTOR VALLEY AUTHORITY EMBRACES CO-DIGESTION TO MAXIMIZE PRODUCTION OF BIOGAS FOR CONVERSION TO RENEWABLE NATURAL GAS IN A GLOBAL-AWARD-WINNING FACILITY

STORY: **Ted J. Rulseh**
PHOTOGRAPHY: **Matt Dayka**



It starts with biosolids and food waste fed to digesters at the Victor Valley Wastewater Reclamation Authority. It ends with hydrogen and electricity for a major Toyota port operation and hydrogen fuel for Toyota Mirai sedans.

In a landmark public-private partnership with Anaergia, the Victor Valley authority in Victorville, California, has taken a wide step beyond the combined heat and power facility commissioned in 2016. The SoCal Biomethane facility on the site of the authority's regional clean-water plant converts biogas to pipeline-quality renewable natural gas for injection into the Southwest Gas network.

Most of that RNG is to be used by Toyota Motor North America's Logistics Services Center at the Port of Long Beach. The plan is for the gas to be fed to fuel cells able to produce 2.3 MW of electricity, more than enough to power the facilities, plus 1.3 tons of hydrogen vehicle fuel per day.

For the co-digestion and biogas upgrading facility, the Victor Valley authority and Anaergia received the 2023 Global Water Award for Wastewater Project of the Year from Global Water Intelligence.

SUSTAINABILITY HISTORY

Founded in 1978, the Victor Valley authority serves about 350,000 residents of five cities in a 279-square-mile area about 80 miles north of Los Angeles. Its regional biological nutrient removal clean-water plant in Victorville and two subregional membrane bioreactor plants have a combined capacity of 16 mgd. Biosolids are thickened, dried on solar beds and applied to farmland.

"We've always tried to optimize our processes and run everything as efficiently as we can," says Kalin Westover, operations supervisor. As one example, for many years the authority ran its Turblex aeration blowers in a direct-drive configuration, using Waukesha engines fueled with biogas.

Brad Adams, director of operations and maintenance, recalls, "Our first venture with Anaergia was a smaller co-digestion project where we took in FOG and anaerobically digestible material from haulers and boosted biogas production to run two combined heat and power units, minimizing use of grid electricity and helping to save cost." Those units, with a combined 1.6 MW capacity, use Caterpillar engines coupled to generators from 2G Energy.



Victor Valley (California) Wastewater Reclamation Authority/ Anaergia SoCal Biomethane facility

BUILT:
Phase 1, 2016; Phase 2, 2021

PROCESS:
Co-digestion of biosolids with food waste; combined heat and power, biogas upgrading

OUTPUTS:
1.6 MW electricity,
3.24 MMBtu/h heat,
320,000 MMBtu/year RNG

BIOSOLIDS VOLUME:
12.5 dry tons per day

BIOSOLIDS USE:
Dewatered cake land-applied

AWARD:
2023 Global Water Award,
Wastewater Project of the Year,
Global Water Intelligence

WEBSITE:
www.vvwraca.gov

Anaergia's combined heat and power facility and biogas conditioning/upgrading plant at the VVWRA treatment plant. Impurities are removed from the methane produced onsite before it is injected into the gas utility pipeline.





Kalin Westover, left, operations supervisor; and Brad Adams, director of operations and maintenance, for the Victor Valley authority.

“Based on the success of that project, we evaluated what we could do in addition,” says Adams. “We had about 1 million gallons of capacity available in three digesters original to the plant that had been inoperable. In talks with Anaergia we asked, ‘What if we built a larger receiving station and used the extra digester capacity to increase biogas production, and then sold that biogas on the open market?’”

That was in 2019, at the early stage of a California law requiring diversion of 75% of organic waste from landfills by 2025. “We wanted to jump in before there were a lot of other people doing the same thing,” says Adams. “That way we could get a bigger share of the potential revenues related to that law.”

MAKING BIOGAS

The \$27 million RNG project was financed by Anaergia under the public-private partnership; the Victor Valley authority did not have to invest money up front. After less than two years of construction, the SoCal Biomethane facility began injecting RNG into the Southwest Gas pipeline in December 2021.

The upgraded receiving station takes in mostly high-strength liquid waste from manufacturers. It includes off-specification syrup from a soft drink company, squeezings from materials recovery facilities, and other materials. “We’re open to anything that has organic value and can be digested,” Adams says.

The waste receiving infrastructure was funded in part by a \$4 million grant from the California Department of Resources Recycling and Recov-

A BOOST FOR DIGESTION

A key component of the co-digestion process at the Victor Valley Wastewater Reclamation Authority is a technology that optimizes biogas production in the digesters.

Omnivore technology from Anaergia uses special OptiMix mixers and robust thickening to enable digestion of biosolids and food waste at 5-8% solids, a much higher solids ratio than is typical in anaerobic digesters.

Digestate including blended biosolids and food waste is drawn from the digester and passed through screw thickeners to remove excess water. Thickened material is returned to the digesters, increasing overall solids content. Then high-powered electric mixers along the digester inner perimeter effectively stir the high-viscosity material.

The propeller-style mixers provide more flow in one minute than traditional mixers deliver in an hour, the company states. Despite their location inside the digester tanks, an anti-ragging design resists material buildup on the mixer blades that could hinder performance.

Each mixer can be adjusted and accessed using a roof-mounted service box that enables the devices to be fully removed from the tank without taking the digester offline.

The mixers can be moved up and down within the tanks to break up stratification, and they can be positioned in various directions to create a swirl that mixes in both the horizontal and vertical planes. This configuration sustains 90% of the mixed volume above the critical velocity all the time, according to Anaergia, preventing settling and supporting a healthy digester even as food waste loading increases.



The view from atop one of the authority’s digesters, using Anaergia’s Omnivore technology.

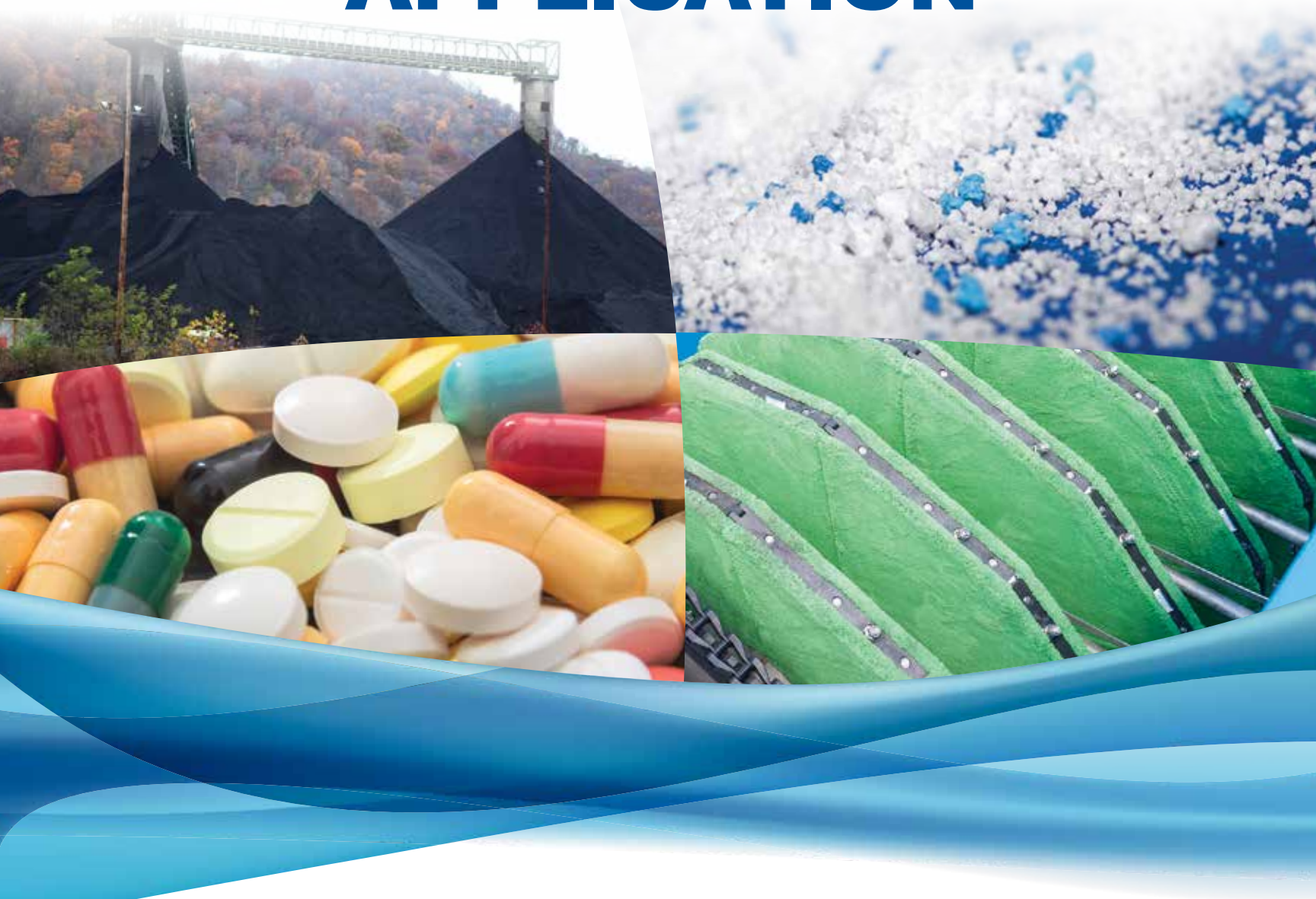
ery (CalRecycle), which brings together the state’s recycling and waste management programs to move the state toward a circular economy.

The authority used the grant to help pay for engineering and construction, community outreach and education, grant administration, and the purchase of an organics polishing system, receiving station and feedstock storage tanks.

Anaergia took responsibility for procuring food waste from outside sources for co-digestion, drawing in part on relationships with haulers

(continued)

INNOVATION BY APPLICATION



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Andrei Davis, receiving attendant, monitors incoming food waste being offloaded from trucks.



David Wylie, safety and communications officer, atop one of VVWRA's digesters, overlooking the wastewater treatment plant.

involved with the company's other co-digestion projects in the region. Materials are lab-tested for organic content and digestibility before acceptance by the authority. Tipping fees of five cents per gallon paid by haulers cover receiving station operating costs.

Material discharged from trucks is run through a rock trap and shredder to remove large objects and then goes into storage tanks. Based on the organic load in storage at any one point, digester feed rates are established.

Victor Valley team members Brandon Talley and Andrei Davis run the receiving operation, making sure the material is properly screened and is put into the right storage tanks to ensure a consistent organic load to the digesters. Alex Nelson is the Anaergia lead in material receiving.

"We don't want to have one storage tank that has weaker material and another with stronger material," says Adams. "They balance which tank they need to send the material to." Once that is done, wastewater treatment operators set the digester feed rates and monitor digester health. Facility staff members handle regular inspections and planned maintenance on all related equipment, including electrical components and instrumentation.

Authority staff members also handle all aspects of maintenance and service on the combined heat and power system. Those engine-generators now

“The RNG project is a showcase of how public agencies, utilities and private business can come together to help resolve significant environmental challenges.”

DARRON POULSEN

operate on pipeline natural gas: “The RNG we produce has much more value on the market than as fuel for the CHP engines,” says Adams.

MAKING THE CONVERSION

Anaergia operates the biogas upgrader that yields RNG, which must meet purity specifications set by Southwest Gas.

Michael Delaney is the lead operator of the gas treatment system, which removes hydrogen sulfide with iron media, strips ammonia with a scrubber system, removes volatile organic chemicals with a temperature-swing absorption system, and removes moisture using a chiller and a heat exchanger.

Finally, the gas upgrader unit separates the methane from carbon dioxide before the RNG is compressed and injected into the pipeline.

The fully automated treatment process is remotely monitored and is supported by service specialists from a similar facility in Rialto and from Anaergia's main office in Carlsbad.

Because the RNG is made from renewable sources that otherwise would emit fugitive methane emissions from decomposition, it is considered carbon negative. When the RNG is then converted to hydrogen and electricity by fuel cells at the Toyota facility, both of those outputs will be considered zero-emissions and carbon negative.

Anaergia estimates that converting the RNG to renewable electricity will avoid more than 9,000 tons of greenhouse gas emissions per year from generation of grid electricity. In addition, the hydrogen produced by Toyota is projected to avoid more than 4,000 tons of annual greenhouse gas emissions that would have been produced if the hydrogen had been created by the conventional process of steam reforming of fossil natural gas.

The fuel cells will also reduce the air pollution to nearby communities because their chemical reactions are essentially free of nitrogen oxides, sulfur oxides and particulate matter emissions.

As for project economics, the Victor Valley authority receives a lease payment from Anaergia for the land on which the biogas upgrader stands. The authority also shares in revenue from trucked-in waste tipping fees and sale of RNG.

Adams observes, “Through the revenue-sharing process we are paying back the capital expenses incurred by Anaergia to rehabilitate our assets on site. After seven years of operation, the capital costs will have been recovered in a way that is cost-neutral to the authority, and then we will receive our full share of the revenue.”

Reflecting on the project and the global recognition the project received, authority general manager Darron Poulsen observes, “The RNG project is a showcase of how public agencies, utilities and private business can come together to help resolve significant environmental challenges. I salute our staff for their hard work in making this project a success.” tpo

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1



- 1) The EmbioArt MBR has a smaller footprint in part because clarifiers are replaced with a more compact membrane unit. This is beneficial when treatment facilities must be expanded in constricted spaces.
- 2) Cannon Artes supplies the core membranes and all supporting components. The biological section is designed through evaluation of the kinetic and operative parameters and the selection of membranes.

2



Flexible and Efficient Treatment

THE EMBIOART MEMBRANE BIOREACTOR IS DESIGNED TO DELIVER REUSE-QUALITY EFFLUENT IN A COMPACT FOOTPRINT FOR MUNICIPAL AND INDUSTRIAL APPLICATIONS

By Ted J. Rulseh

Membrane bioreactors can be an effective alternative to conventional activated sludge, especially where concentrated wastewater must be treated or conditions require high efficiency and compact footprint.

Cannon Artes offers the EmbioArt MBR, with broad applications in the municipal and industrial wastewater treatment sectors. The company says the technology yields high-quality effluent that meets water reuse requirements.

The treatment process combines an aeration basin with membranes. The membrane modules are submerged in a dedicated basin downstream of the biological reactor. The number of trains can be optimized based on customer requirements, and the system is delivered complete with all control and safety devices.

In the MBR basin, the process can operate with mixed liquor suspended solids up to 12,000 mg/L, so that a lower volume is required. The system is designed to be flexible based on customer requirements in layout, air consumption, chemicals and energy. The process is fully automated.

Serena De Maria, Ph.D., research and development engineer and process specialist with Cannon Artes, talked about the technology in an interview with *Treatment Plant Operator*.

tpo: How would you characterize the basics of this technology?

De Maria: EmbioArt is an improved version of conventional activated sludge reactors. It consists of biological treatment in which the downstream solids-liquid separation is carried out by membranes instead of a secondary clarifier. The absence of settling constraints allows higher mixed liquor suspended solids in the aeration basin and a longer sludge retention time. The result is more efficient treatment that complies with water quality requirements for reuse.

tpo: How do you differentiate EmbioArt from other MBRs?

De Maria: It is a complete turnkey system. We provide a tailor-made solution based on the application, inlet water characteristics, and technical requirements. We supply the core membranes and all supporting components, starting from optimized pretreatment to limit solids accumulation and fouling on the membranes. We design the biological section through careful evaluation of the kinetic and operative parameters and the selection of membranes. Finally, we monitor all the phases of the operative cycle, cleanings and maintenance.

“It is a complete turnkey system. We provide a tailor-made solution based on the application, inlet water characteristics, and technical requirements.”

SERENA DE MARIA, PH.D.

tpo: What are the sweet-spot applications for this MBR?

De Maria: The advantages of reduced footprint and high efficiency can be observed at small and large installations for municipal and industrial wastewater. For municipal facilities, the technology treats high organic loads and can be easily expanded to accommodate growth. In food and beverage processing, the system can handle very high organic loads that could not be treated with conventional activated sludge. In pharmaceuticals it allows pretreatment of micropollutants; in petrochemicals it is advantageous for water reuse. In pulp and paper its use for water reclamation is important due to the large amount of process water needed.



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

De Maria: Wastewater goes through a pretreatment step designed based on site-specific water quality to minimize suspended solids as well as oil that could interfere with the biological process and cause membranes fouling. The influent stream then undergoes biological treatment where biomass concentration is much higher than in conventional treatment. This provides the same results at lower volumes, reducing the plant footprint.

In addition, older sludge (higher sludge retention time) is more efficient and well stabilized, and so the required wasting of sludge is lower. Solid-liquid separation from the biological section is fed to the membranes, which are provided in different configurations (hollow fiber or flat sheets) and different materials. During filtration, treated water is extracted from the membrane basin to a dedicated treated water basin. The filtration phase is alternated with backwashing, relaxation and ventilation as well as cleaning and air scouring, which are optimized and monitored based on specific water characteristics to minimize energy consumption and chemical dosages.

tpo: What effluent pollutant levels can the unit achieve?

De Maria: Long solids retention time enables effective nutrient reduction and effluent BOD of less than 1 mg/L. Nitrogen and phosphorus can be further reduced by optimized alternation of aerated and anoxic zones. Membrane modules downstream from the biological section deliver less than 5 mg/L TSS less than 30 mg/L COD. In addition, membrane pores in the ultrafiltration range enable separation of viruses and bacteria, possibly meeting disinfection requirements and avoiding tertiary treatment.

tpo: What makes the technology's small footprint possible?

De Maria: The required tank volumes are lower than for conventional activated sludge reactors, and the system operates at the same MLSS in lower volumes. The footprint is also smaller because clarifiers are replaced with a more compact membrane unit. A compact footprint is particularly advan-

“To meet site-specific treatment requirements, sophisticated software allows presetting of all parameters.”

SERENA DE MARIA, PH.D.

tageous when space is limited and when treatment facilities must be expanded in constricted spaces.

tpo: How much operator attention is required to run the unit?

De Maria: Aside from a startup phase and recovery cleaning, which should be performed a few times a year to restore membrane permeability, all operations can be considered automatic. This is an advantage in view of the many and frequent steps that make up the technology, both during regular operation (filtration, relaxation, ventilation, backwashing) and maintenance cleaning with sodium hypochlorite and acid. To meet site-specific treatment requirements, sophisticated software allows presetting of all parameters, such as dosages and frequencies and the duration of each step, and enables remote monitoring. This helps save on energy and chemicals.

tpo: How does this unit compare with others in energy efficiency?

De Maria: Energy is consumed by the air scouring necessary to counteract membrane fouling. When high performance is required, conventional biological treatment would require additional and more energy-intensive and costly treatment. In addition, careful monitoring of maintenance cleanings by integrated software helps avoid start/stops and overdosages, reducing energy costs. **tpo**

We welcome letters to the editor.

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Pam Childs, water/wastewater operator, performs daily checks and testing on the Ultra Mag wastewater flowmeter (McCrometer) at the Gooding City plant.

Upgrades Make the Difference

MODERN WATER METERS, GIS SYSTEM MAPPING, AND IMPROVED WATER PRESSURE MONITORING LED THE WAY TO AWARD-WINNING PERFORMANCE FOR IDAHO'S GOODING CITY WATER WORKS

STORY: **James Careless** | PHOTOGRAPHY: **Darren Russinger**

“We’re extremely fortunate. Our water source is really clean.”
NOEL EDWARDS



Gooding City Water Works main booster pump location (American-Marsh split case pump from Wilo).

Quality service. Reliable supply. Low rates for customers. Those are the objectives that drive Noel Edwards and the team at the Gooding City Water Works in Idaho. Substantial system improvements have been key to achieving those aims. They include adding advanced water meters with remote usage reporting capabilities, mapping the water infrastructure electronically, and using technology to detect and respond quickly to drops in water pressure.

Those enhancements, and others, helped the Gooding City utility earn the 2022 Drinking Water System of the Year from Idaho Rural Water Association. Deserving to win isn’t the same as expecting to win: News of the award win came as a surprise to the utility team.

“This was a complete shock for all of us, especially there at the awards banquet,” says Noel Edwards, water and wastewater superintendent. “We weren’t expecting to win. I mean, there are a lot of good communities in our area, so we feel blessed.”

QUALITY SOURCE

Gooding is the county seat in a county of the same name. The water works serves about 3,700 people in an area covering 2.5 square miles. The distribution network consists of about 28 miles of pipe. “We produce from 200,000 gallons to 2.4 mgd, depending on the demand,” says Edwards.

The water source is groundwater, extracted from using three 200 hp pumps, and one 100 hp pump, 7322 BCBM models, from Nidec Motor Corporation. This water is discharged directly from the source to the pump and then into the mains with a direct-injection chlorine feed. The city has a 1 million-gallon reserve tank as a backup supply.

“We’re extremely fortunate,” says Edwards. “Our water source is really clean. We’ve been really blessed with not having to do much treatment for the community to provide quality drinking water.”

Gooding City Water Works

Gooding, Idaho
www.goodingidaho.org



ESTABLISHED: **1920**
 POPULATION SERVED: **3,700**
 SERVICE AREA: **1.5 square miles**
 EMPLOYEES: **6**
 FLOWS: **200,000 to 800,000 gallons**
 SOURCE WATER: **Groundwater**

TREATMENT PROCESS: **Chlorination**
 SYSTEM STORAGE: **1 million gallons**
 DISTRIBUTION: **28 miles of water mains**
 ANNUAL BUDGET: **\$1,614,115 (operations)**
 KEY CHALLENGE: **Keeping up with maintenance and demand while keeping rates low**

NOTABLE IMPROVEMENTS

The City of Gooding was established in 1907, and the water distribution system came online in 1920. “It’s over a hundred years old,” Edwards says. “Over that time, the city has made all kinds of improvements to the system.” The latest improvements are designed to keep costs down while maintaining water quality and availability. “These changes are going to save consumers money while ensuring service,” says Edwards.

The IRWA cited installation of Sensus Meter Transceiver Units (MXUs) at customer locations as the utility’s standout accomplishment in 2022. “They acquired and installed approximately 1,200 MXUs,” says the award citation. “These meters transmit a remote signal reporting water usage, which shortens the meter reading time by a day and a half each month and has saved the community over \$300,000.”

“If a bad situation happens and the community loses power, we don’t have to worry about running out of water.”

NOEL EDWARDS

The team at Gooding City Water Works includes, from left, Paul Childs, water/wastewater operator; Noel Edwards, water/wastewater superintendent; and Pam Childs, Jase Stockham, Glen Neal, and Joel Eilers, water/wastewater operators.



Gooding City Water Works staff members Joel Eilers (left) and Paul Childs perform daily checks and testing at the plant, which produces 200,000 gpd to 2.4 mgd.

“Reading signals remotely replaced taking three to four days to read meters manually,” says Edwards. “Now we do a drive-by and read them all in less than one working day.”

Next, the city took the guesswork out of locating water system assets by electronically mapping their positions using GIS. Edwards observes, “The GIS we developed with IRWA works on [the IRWA’s] SCADA system, which constantly monitors our remote sites.

“Using the GIS, our crews can go out in the field with tablets or cellphones and see the locations of sewers, manholes, waterlines, water valves and fire hydrants. In fact, we’re able to see everything in the field day or night. That really helps with response times and emergency calls.”

In the same vein, the SCADA system keeps a constant eye on pressure and water flows throughout the distribution network. Detecting pressure drops as they occur speeds up response time and troubleshooting.

Meanwhile, to ensure water delivery even when utility power fails, this utility has installed two Kohler Power Systems 250REZXB 260 kW backup power generators. “If a bad situation happens and the community loses power, we don’t have to worry about running out of water,” says Edwards.

AN ABLE TEAM

To keep water flowing, Edwards works closely with a team of five operators responsible for the city’s drinking water, wastewater collection, and wastewater treatment systems.

Edwards, has a Water Distribution 2 license and a Collection 1 license.

Paul Childs and Glenn Neal wastewater treatment operators, have those same qualifications. Pam Childs, water and wastewater operator, has a Collection 1 certification and is scheduled to receive her Distribution 1 license. Jase Stockham and Joel Eilers, water and wastewater operators, are working on their certifications. Hayden Peterson is the deputy city clerk who does the billing end of the water system in city hall.



A Kohler generator provides backup power for the Gooding plant's main booster pump.

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“We try to be a team — not just coworkers, but an actual team,” Edwards says. “We spend a lot of time together. We depend on each other. With these people, when one struggles, the rest will pick up and help them through.”

MAINTAINING BALANCE

Having access to a reliable and clean water source, plus up-to-date and well-maintained infrastructure and equipment, means the Gooding's water works avoids getting stuck in crisis mode. But success doesn't come without challenges.

“Our biggest challenges include just keeping up with the maintenance and demand while keeping the price low,” says Edwards. “We don't want to raise rates. We just want to keep delivering quality drinking water in an adequate supply without affecting the community. And so every upgrade we do, we have to justify that it's cost effective while providing benefits to the community.”

“Using the GIS ... we're able to see everything in the field day or night. That really helps with response times and emergency calls.”

NOEL EDWARDS

A case in point: “Our main booster pumping station that supplies our million-gallon tank is getting 30 to 40 years old.” Edwards says the team plans to add two smaller booster pumps, likely running at 25 and 50 hp, to support the existing 3,000 gpm booster pump. “They ... will help us lower our power consumption and cut our energy costs.”

As for keeping up with future demand, the Gooding City Water Works has plenty of room to grow. “We added two new well sites three years ago. With those online we're capable of providing 11.5 mgd for a community of 3,700 people. So we're doing well on upgrading the system for future growth with those two new wells we've put in. We're serious about continuing to provide Gooding with clean, reliable drinking water at an affordable cost.” tpo

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More Than Groundbreaking

CHARLOTTE WATER STARTS EARLY TO FORGE CONNECTIONS WITH ITS COMMUNITY AROUND CONSTRUCTION OF A NEW 25 MGD WATER RESOURCE RECOVERY FACILITY

By Sandra Buettner

Charlotte Water needed to build a new clean-water plant to serve one of the fastest-growing cities in the United States.

Two older plants will be decommissioned to make room for a state-of-the-art facility that will treat water from Charlotte and two neighboring North Carolina communities. The utility purchased 90 acres of land on the Catawba River for the Stowe Regional Water Resource Recovery Facility.

Ground has been broken for the Stowe facility, which when completed in mid-2026 will treat up to 25 mgd. To introduce this project to the community and keep residents up to date, the utility created a website that was extremely useful during the COVID pandemic when face-to-face communication was paused.

STOWE AND STEM

The utility sent more than 30,000 mailers to area residents asking what they liked about their community. Among other things, respondents said they liked the trees, the natural area and raising their families there.

The Stowe plant project team began engaging with schools in the project design phase. Team members learned that several schools were interested in the project, among them Whitewater Middle School, a STEM school with an environmentally focused program.

Some schools wanted to partner with Charlotte Water to incorporate news about progress on the new facility, along with water information, into the curriculum. To that end, the utility incorporated the suggestions into its Community Benefit Project, providing field trips, in-class instruction and age-appropriate literature on water treatment processes.

“We sat down with the science teachers from the middle school to brainstorm how we could teach the children about water and wastewater treatment in fun and engaging ways.”

NICOLE BARTLETT



Charlotte Water's Toilet Bowl Cornhole game was a hit with the kids at Riverfest 2022 in Belmont, part of the utility's outreach program.

“We sat down with science teachers from the middle schools to brainstorm how we could teach the children about water and wastewater treatment in fun and engaging ways,” says Nicole Bartlett, engineering division manager for Charlotte Water and project manager for the Stowe facility.

One idea was to create a puzzle by dividing the children into groups. Members of each group had to explain their portion of the water resource recovery process. Then the members came together to understand how all the processes worked together.

COMMUNITY BENEFITS

To foster community involvement and cooperation with the construction project, Charlotte Water sent flyers to residents and reported on progress through social media. Staff members also attended events at the schools.

“We attended an open house at Whitewater Middle School where parents and students met teachers



The Stowe Community Stakeholder Committee on a preconstruction site tour in March 2022.

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and learned their way around the school,” says Bartlett, “We provided informational brochures on the project, backpacks, reusable water bottles and activity books for the students.”

After speaking to more than 200 parents, students and faculty members, utility team members outlined the benefits the project would bring to the area, including:

- Improved water quality in the Catawba River
- Horizontal directional drilling under the River
- A 90-acre community benefit project
- Educational walking trails connected to the STEM middle school
- Field trips and help with STEM curriculum
- Opportunities for STEM careers
- Promotion of environmental sustainability
- Conservation of natural land

FORGING CONNECTIONS

Students and educators from Whitewater Middle School were invited to the new plant site to observe progress throughout construction. The utility ultimately plans to expand outreach to area elementary schools, high schools and the community college.

The utility is taking numerous steps to foster connections with the community. The middle school football team won its homecoming game, and Charlotte Water staff members were there. They handed out project-branded Gator green reusable water bottles to congratulate the team.

During that event and others, the utility provides a popular Toilet Bowl Cornhole game for younger children. Kids take turns tossing plastic water droplets into a toddler training toilet. **tpo**

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Up to the Challenges

JAMIE KRELLER IMPROVES HIS CLEAN-WATER PLANT WITH UPGRADES, HIMSELF WITH LEADERSHIP TRAINING, AND OTHERS WITH AN ASSOCIATION-BASED EDUCATION PROGRAM

STORY: **Jim Force** | PHOTOGRAPHY: **John Marinelli**

Jamie Kreller is used to overcoming challenges, professional and personal.

As superintendent at the Suffield Water Pollution Control Authority in Connecticut, he has had to address deteriorating infrastructure, use in-house expertise wherever possible to save money and prepare for new contaminants and tightening regulations.

And throughout his career, he has dealt with issues brought on by his lifelong battle with post-traumatic stress disorder. He acknowledges occasional nervousness in public speaking and writing. "I can come across as shy," he says. "I'm not the greatest at it."

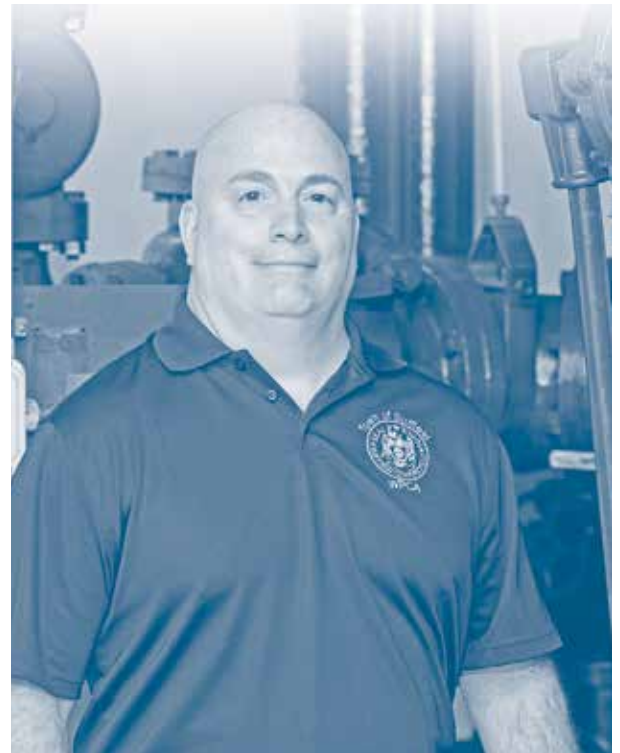
But he has taken that as a challenge and recently completed the Water Environment Federation's Water Leadership Institute, an eight-month program designed to educate, train and update water managers and help them build strong, lasting relationships within the clean-water professions.

In a competitive application process, more than 130 professionals applied, and Kreller was one of 54 selected. "It is a great program," he says. "It was more work than I thought, but I now have more confidence speaking."

FROM THE FAR

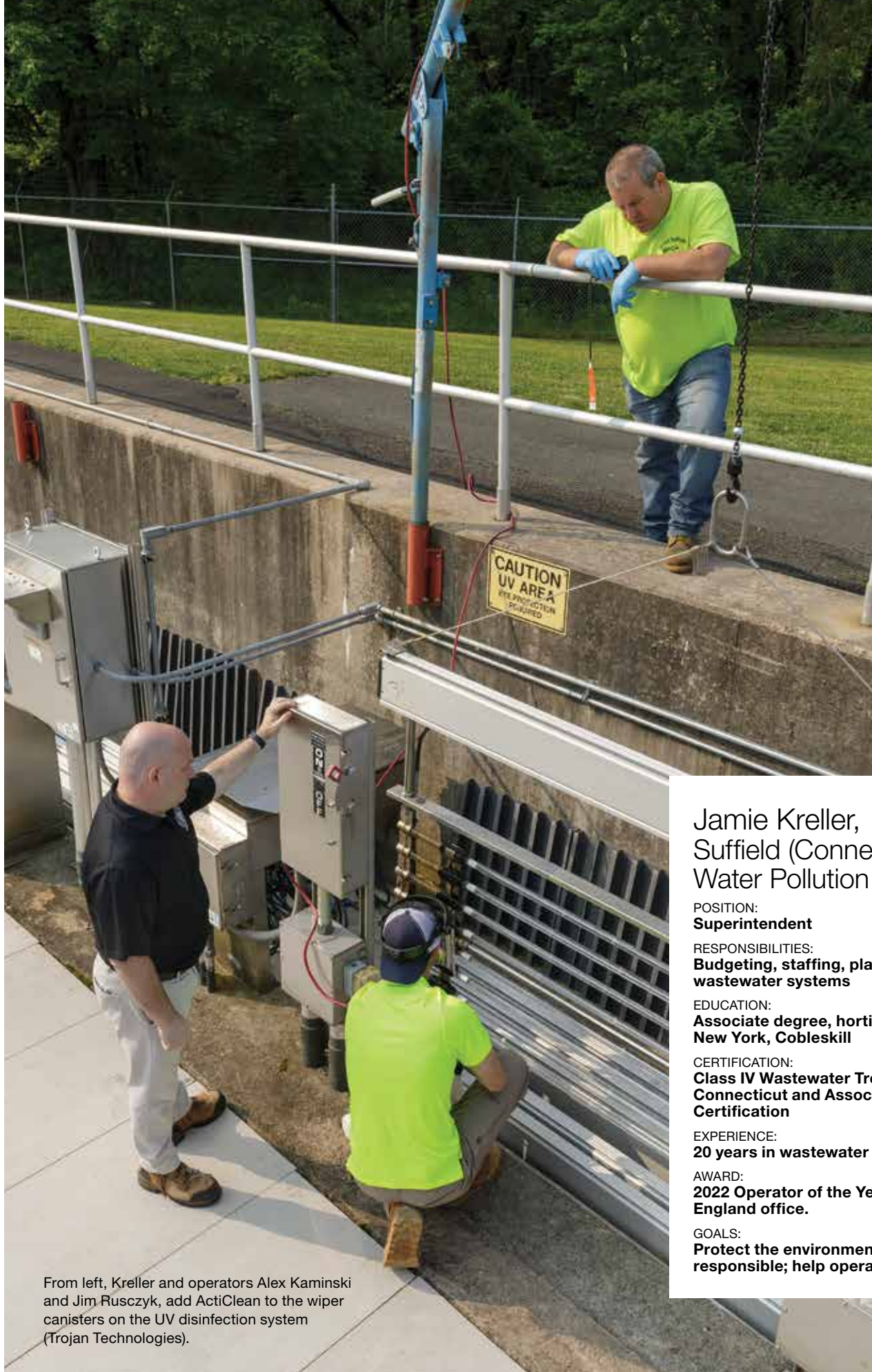
Wastewater treatment was the farthest thing from Kreller's mind when he started his postsecondary education at State University of New York Cobleskill. Having grown up working on farms, he studied horticulture and conservation and started out in the landscaping business after graduation.

"That wasn't my thing," he says now. He moved on to become a dispatcher for the city of Enfield, Connecticut. In



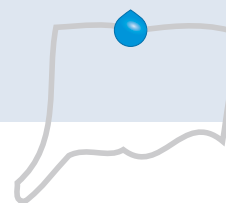
Jamie Kreller, superintendent, Suffield Water Pollution Control Authority

2004, Enfield posted a position in the sewer department, and Kreller thought he'd give it a try. He stayed there until 2013 when he joined the staff at the Suffield authority as an operator at the wastewater treatment facility. Six years later he was named superintendent.



“Everything is becoming more and more stringent, but that is why we have our jobs. We’re protecting the health and safety of the people downstream.”

JAMIE KRELLER



Jamie Kreller, Suffield (Connecticut) Water Pollution Control Authority

POSITION:
Superintendent

RESPONSIBILITIES:
Budgeting, staffing, planning, operation of wastewater systems

EDUCATION:
Associate degree, horticulture, State University of New York, Cobleskill

CERTIFICATION:
Class IV Wastewater Treatment Operator, Connecticut and Association of Boards of Certification

EXPERIENCE:
20 years in wastewater treatment

AWARD:
2022 Operator of the Year award, U.S. EPA New England office.

GOALS:
Protect the environment while being fiscally responsible; help operators achieve their goals

From left, Kreller and operators Alex Kaminski and Jim Rusczyk, add ActiClean to the wiper canisters on the UV disinfection system (Trojan Technologies).



The team at the Suffield Water Pollution Control Authority includes, from left, Mike Koczera, Anthony Liquori and Ed Golec, operators; Alex Kaminski, chief operator; Jim Rusczyk, operator; Kevin Bertrand, operator-in-training; Jared Murphy, operator; Julie Nigro, business administrator; and Jamie Kreller, superintendent.

DEALING EFFECTIVELY WITH MENTAL HEALTH ISSUES

As part of Water Leadership Institute training, Jamie Kreller and two colleagues presented a three-part discussion called “Creating a Healthy Workplace in a Changing World.”

Kreller’s talk focused on mental health, a familiar topic since he has dealt with post-traumatic stress disorder since his youth. He pointed out that current workplace mental health programs are ineffective because they are often designed by outside firms or the organization’s human resource department and really don’t relate to individual managers or team members.

“We need to change how we deal with mental health in the workplace,” Kreller says. “Mental health is the leading cause of disability in people up to age 45. One in five adults will exhibit mental health issues in any given year, but only 43% percent will receive treatment.”

Kreller notes that inattention to or poor management of mental health issues costs organizations worldwide over \$1 trillion. He cites COVID as an example: he believes most companies felt they should have been better prepared for the pandemic’s impact. He suggests these steps for building a workforce more resilient to mental health issues:

- Prepare leaders to help employees facing mental health struggles; it should be part of management training and development.
- Use personal experiences (like his own) to make team members and their managers more comfortable talking about mental health challenges they face.
- Develop a “first-aid” course that teaches how to listen without judgment to team members with mental health issues, and provides information needed to address them.

IMPROVING OPERATIONS

The Suffield facility (2.02 mgd design) processes an average of 1.3 mgd. Influent flows to the plant through 80 miles of sewer lines, 19 pumping stations and three low-pressure sewer systems. The plant handles wastewater from homes and businesses and the MacDougall-Walker Correctional Institution.

The headworks is equipped with a step screen (HUBER Technology). A Carousel oxidation ditch (Ovivo) provides secondary treatment, followed by secondary clarification and UV disinfection (Trojan Technologies) before discharge to the Connecticut River.

Biosolids are treated with polymer and dewatered on belt-presses (Alfa Laval). Cake is hauled to the Hartford wastewater utility 17 miles away. The plant uses a GE iFix SCADA system.

Kreller’s staff eight operators, all of whom hold wastewater operator

certification. They include Alex Kaminski, chief operator; operators Mike Koczera, Jim Rusczyk, Jared Murphy, Ed Golec, Tyler Hinckley and Anthony Liquori; and Kevin Bertrand, operator-in-training.

Kreller is proud of the improvements he has overseen and the creative and dedicated work of his staff. They’ve done a lot with the collections system. “It hadn’t been cleaned regularly, and we were really pushing our lines,” Kreller says. “We televise it now, and we have established an annual inspection program. We couldn’t have done it without our operators. The entire system will be cleaned every five years.”

“Not enough people talk about mental health. Having people to help you, to back you up, is important.”

JAMIE KRELLER

DEALING WITH CHANGE

Staff effort is a high point. The Suffield staff has rebuilt several pump station buildings in-house, saving thousands of dollars. That helps, because the utility will need funding to upgrade aging infrastructure including sewer pipes, pump stations and generators. “Most of our equipment and lines are 30 years old or more,” Kreller says.

In addition, it will be costly to meet new regulations, particularly if PFAS have to be reduced or eliminated from the wastewater: “Everything is becoming more and more stringent, but that is why we have our jobs. We’re protecting the health and safety of the people downstream.”

Working with the younger operators is a source of satisfaction for Kreller: “Three of our operators are under age 30. I enjoy helping them, getting them to be the best they can be, so they can have great careers.” He often works with younger operators at home on Saturdays, helping them prepare for and pass their licensing exams.

“We need to think outside the box,” Kreller says. “When you start in this field, people need to help each other out. We need to be open with employees. They want to be part of the decision-making, part of management.”

LEARNING TO LEAD

Becoming a better clean-water professional was the aim of Kreller and others applying for the WEF Water Leadership program in 2021. Classes and



The Suffield facility (2.02 mgd design, 1.3 mgd average) uses a Carrousel oxidation ditch process for secondary treatment (Ovivo).

group discussions focused on strength-based leadership; leading with emotional intelligence; technology and innovation; managing versus leading; time and conflict management; and public education, advocacy and communication.

The program included homework, books to read, and a discussion session once a month. Because of the COVID pandemic, most classes and discussions were conducted remotely over a 10-month period. However, at the end of the program, the students were able to gather at the WEFTEC conference in Chicago for face-to-face sessions.

“That was a great experience,” says Kreller. “For our final project, we were given nine topics. We were assigned one and prepared a special ‘TED Talk’ program and a roundtable discussion among our group. Ours was ‘When You Can’t Keep Doing it the Way You’ve Been Doing it,’ reflecting recent changes in the profession, especially those brought on by COVID.

“I focused on the mental health side of the issue. I wanted to focus on the stigma associated with mental health. Not enough people talk about it. There aren’t many people or resources available to help. Having people to help you, to back you up, is important.”

“We need to be open with employees. They want to be part of the decision-making, part of management.”

JAMIE KRELLER

KEEPING THE MOMENTUM

There’s more to Kreller’s desire to improve leadership. Along with Megan Ambrose of the University of Connecticut and Jeff LeMay of the South Windsor wastewater facility, Kreller worked to resurrect an association-level management program.

It was pretty much put on the shelf during the COVID pandemic. “We didn’t want the management program to go by the wayside,” Kreller says. “It was the first activity with the program since 2018.” His participation in the WEF leadership program gave him new ideas for the association-based leadership curriculum.

The program brings outside sources such as state Department of Energy and Environmental Protection staff members to demystify the permitting process. Other experts elaborate on safety and safety manuals. Students shadow superintendents to get a better feel for job requirements. They must complete reading assignments and give presentations, which help them with communication skills: “For many, it’s their first time speaking publicly.”

In the program, 16 students work on skills and knowledge needed to become leaders in the clean-water field. “They have been great,” Kreller says. “Three of them have gone on to top management positions.”

The team of Kreller, Ambrose and LeMay hit it off. “Working with Jamie is fantastic,” says LeMay, who has known Kreller for several years. “He provides insight from all his experiences.”

LeMay observes that Kreller is humble but exhibits leadership in having a clear vision of what he wants to accomplish. At the same time, he is always willing to listen to others: “He can be reluctant at times to toot his own horn, but he has a wealth of knowledge.”

While Kreller will tell you he still has lots to learn, his management style and desire to improve have already paid off. In 2022, the New England office of the U.S. EPA named him an Operator of the Year. The regional awards

program recognizes professionals who have provided “invaluable public service managing and operating treatment facilities.” **tpo**



Jamie Kreller, watching Mike Koczera complete a TSS test, was named a 2022 Operator of the Year by the U.S. EPA New England office.

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CLOSE COMMUNICATION BETWEEN MUNICIPAL TREATMENT PLANTS AND INDUSTRIAL DISCHARGERS IS ESSENTIAL TO HIGH-PERFORMING PRETREATMENT PROGRAMS

By Ted J. Rulseh

Effective industrial pretreatment revolves around one basic thing: open communication between staffs at the industrial facility and the municipal clean-water plant.

That's the opinion of Alan Johnson, compliance and safety manager with Operators Unlimited, a contract operations company based in Duncan, South Carolina, and serving mainly industrial customers. While factors like good plant design, effective maintenance and the use of automation are also essential, it's good relationships that make programs work, Johnson says.

Operators Unlimited serves mainly South Carolina but also has customers in Georgia and North Carolina. The company serves facilities in the food and beverage, metal finishing, automotive chemical, textile, packaging, coating, adhesive, sealants and general manufacturing sectors.

Its staff of 36 includes 20 professional wastewater treatment operators, serving some 65 customers. Johnson talked about the company and the keys to high-performing industrial pretreatment programs in an interview with *Treatment Plant Operator*.

tpo: What is your background in wastewater operations?

Johnson: I have been an operator for 34 years, of which 28 years were in the municipal world. I have operated probably 40 to 50 treatment facilities. For several years I was a public works director, and as part of that I was responsible for a pretreatment program covering 21 industrial sites. After I retired I went into the private sector, working in physical-chemical industrial operations. I have been with Operators Unlimited for five years.

tpo: How would you describe your company's mission?

Johnson: Our mission is transformation. We want the people we serve to be better for having worked with us. When we do operations, it's not simply going in and getting the job done. We like to make things better wherever we can.

“If an industry is having an issue, sometimes the municipal plant has flexibility in what they can do. You don't know until you ask.”

ALAN JOHNSON

tpo: Do you focus strictly on industrial customers?

Johnson: We are almost exclusively industrial. We don't actively pursue municipal facilities, but we do work with some of them. Manufacturers typically are not in the business of wastewater treatment, whereas municipal utilities have that as their sole focus. We go into industrial facilities and take that off their plate.

tpo: What is the range of operations-related services you provide?

Johnson: We provide the wastewater chemistry. We provide the operations. We can do design-build projects. We have technical resources, so if a customer is having problems with their wastewater, we come in and figure

out what is going on. We also do compliance, whether that's reporting or working with permitting. We train staff. We can do one or more of those or a combination of them all.

tpo: What would you say is the biggest challenge facing industrial facilities in wastewater treatment?

Johnson: The biggest challenge is staffing, having qualified operators to do the work that needs to be done. Operators, and here I include myself, are getting older and looking at retirement, and we don't see many young people coming in. Along with that, we see production increasing, and often it's hard for wastewater treatment to keep up with production demand. So some treatment facilities are in need of upgrading.

tpo: What advice do you give to industrial customers about dealing effectively with municipal treatment plants?

Johnson: One of the most important things is open communication. I've been on both sides of the fence. Some in industry say, "We don't want to talk to the municipal plant because that's just going to lead to more issues." But if an industry is having an issue, sometimes the municipal plant has flexibility in what they can do. You don't know until you ask. The most effective approach is an open door policy.

tpo: What else is important for industrial dischargers to know?

Johnson: They need to be completely aware of their permit provisions. Often, the environment, health and safety people have a lot of plates in the air, but being familiar with the permit, knowing exactly what it says, can be a big help.

tpo: Can you cite an example that shows the value of good communication?

Johnson: Suppose an industrial user for whatever reason has some wastewater with a higher TKN or BOD than the permit allows. They should contact the municipality and ask if they can discharge it, as opposed to having a contractor come in and haul it off. The municipality might have room in their permit to be able to help. They might charge more to treat that water, but that's still less expensive than having it hauled to another facility for treatment. It's better to have the conversation than to assume it's something the municipality can't do.

tpo: What suggestions would you have for pretreatment coordinators in dealing effectively with industrial users?

Johnson: I don't know of any municipality where we have an adver-



Alan Johnson

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serial relationship. It goes back to communication. In my experience as a pretreatment coordinator, it was helpful to know that most of these industries just want to make their products. We all want a clean environment, and we all know industrial users contribute to the economy. They hire people. They're not in the wastewater business. They just want to do what they do. They're not the enemy.

If a municipal plant has a treatability issue, they should reach out to industrial users and say, "This is going on — any thoughts?" Once when I was in the municipal world we went through a long process of figuring out why we were failing our whole effluent toxicity tests. There were two basic ways to deal with that. One was to try and catch somebody dumping on us. The other was to tell everybody what was going on — maybe they were discharging something they didn't even know about. We chose the latter approach. I think that's a lot more productive.

tpo: Have you seen cases where the municipality offered training to industrial facilities' operations staffs?

Johnson: Not actual training, but many municipal utilities used to have yearly industrial meetings and awards luncheons, such as for facilities that had 100% compliance. That was a great opportunity for the two sides to get together and talk about potential issues. Operators Unlimited does training, but I'm not aware of municipalities that do. Pretreatment coordinators are pretty good about communicating with the industrial users.

tpo: How do you go about recruiting and retaining good people?

Johnson: In the industrial field it's extremely difficult to find certified operators who aren't already comfortable where they're working. The South Carolina Water Environment Association has an apprenticeship program that I believe is geared toward municipal treatment. We are starting our own program for industrial processes. We find people who aren't necessarily cer-

“ We all want a clean environment, and we all know industrial users contribute to the economy. They're not the enemy.”

ALAN JOHNSON

tified and start them on a track where they can learn the business. We've had some success bringing people in who, for instance, have a chemical background. We train them and prepare them for wastewater operations and guide them through the certification process.

tpo: What would you say are a few keys to an effective and compliant industrial wastewater treatment operation?

Johnson: One of the keys is communication between the production and wastewater treatment teams. The production staff should be versed in wastewater treatment, what they can handle and what they can't. The operations staff needs to understand that there are going to be upsets at times. It's not about pointing fingers. It's about what they've got and how to treat it. Proper plant design is another key. Preventive and predictive maintenance ensure that everything keeps running so that production can keep running. And finally, alarm telemetry and automation are hugely important to operating a compliant system. **tpo**

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In on the Ground Floor

OPERATIONS AND MAINTENANCE TEAM MEMBERS ARE KEY PLAYERS IN DESIGNING AND BUILDING A \$184 MILLION FACILITY UPGRADE IN PRINCE WILLIAM COUNTY

By Ted J. Rulseh

A \$184 million upgrade of the H.L. Mooney Advanced Water Reclamation Facility won't be completed until 2027.

Still, operations and maintenance team members have experienced the finished facility through virtual reality. Wearing special headsets, and thanks to a 3D facility design, they've been able to "walk through" the upgraded plant, observing details like the spacing between pumps and the locations of valves.

That's just one of the ways in which the people who will run and service the plant have been part of the planning and design process from the beginning. And their input will continue all the way through nearly four years of construction, according to Rachel Carlson, water reclamation superintendent for the Prince William County Service Authority in Virginia.

"Throughout this process there has been full transparency with staff," says Carlson. "They've had access to everything from the preliminary engineering reports all the way through the design deliverables and specifications. Their input has been not only heard but seriously incorporated into the design."

"That's important because the plant staff will own the new equipment and processes after construction is done. There shouldn't be any questions about why this was installed, or why that was put there, because they will have had a voice throughout the whole project."

MAKING THE OLD NEW

Close coordination between engineers and the operations and maintenance teams is essential in major projects like this one, according to Meredith Welle, P.E., design-build engineer and project design manager with HDR, the consulting engineers on the upgrade.

“Throughout this process there has been full transparency with staff. Their input has been not only heard but seriously incorporated into the design.”

RACHEL CARLSON

"We value the input of the operators and the plant staff very highly," Welle says. "We make initial recommendations for what we regard as good equipment selections for particular processes, but we review the recommendations with the project team and get their buy-in on specific manufacturers or equipment models, especially for the more major equipment. We especially want their buy-in on electrical equipment and instrumentation. We have those conversations, we take their feedback, and we put that into our specifications and contract drawings."

The 24 mgd (design) H.L. Mooney plant needs extensive modernizing that will affect most of the facility, even though the plant capacity and the activated sludge treatment process will not change. "The project has 19 components, mostly rehabilitating existing infrastructure," Carlson says. "The plant went online in 1981 and we have a lot of original equipment."



Using special virtual reality headsets, operators were able to "walk through" a 3D design of the upgraded H.L. Mooney facility and experience the layout and the environment in which they will work when construction is complete.

The most significant components of the upgrade are construction of a new preliminary treatment facility and expansion and centralization of the odor control system. The original headworks has not kept up with two plant expansions that increased capacity from 12 mgd to 18 mgd (early 2000s) and to 24 mgd (2010).

"With the more intense storms that are happening, we are getting higher flows to the plant," observes Maureen O'Shaughnessy, water reclamation process engineer. "So, after study and hydraulic modeling, we decided that we needed a new headworks designed for both today's and future flows."

The headworks will have screens with several channels, providing flexibility to adjust to wet-weather flows. It will also include a HeadCell enhanced grit removal system (Hydro International) along with screenings management and grit washing technologies.

The new centralized odor-control facilities will relocate two packed-media chemical scrubbers and add a third, raising capacity to 95,000 cfm. The existing odor-control system captures air from the headworks, pre-aeration chambers and gravity thickeners. The new system will also capture air from the five primary clarifiers, which will be covered, and from the solids building.

The progressive design-build project is scheduled to start construction in later 2024 for completion in August 2027. The general contractor is Ulliman Schutte.

STARTING EARLY

Plant operations and maintenance personnel were brought in at the start of the design phase. "We thought it was important for them to have input into the design," says Carlson. "Another driver behind that decision was that

we've had a lot of our staff retire. We have quite a few staff members with only a few years of experience at the plant. Their early involvement helps fast-track their knowledge and their understanding of the process equipment."

Early in the process, service authority leaders identified the key plant staff members who would be involved in the design and offloaded some of their day-to-day work to make them available for what would be a demanding task.

"Once we got into discussing the design, we held weekly internal meetings to review the drawings and provide input," Carlson says. "We also had weekly meetings where the contractor came on site to meet with the field staff. Using virtual reality, they could walk through the 3D model. During those workshops the contractor captured feedback to take back to the design engineers."

An added benefit of involving O&M staff in the design is that they will be familiar with the project heading into the construction phase: "The project will include a lot of rehabilitation of existing equipment," Carlson says. "We'll be taking tanks and equipment in and out of service, and that will involve a lot of effort and coordination with the contractor."

STAFF MEMBERS GRATEFUL

Leaders of the plant operations and maintenance teams embraced the transparent and inclusive design process. "It has been a good learning experience for everybody," notes John Madaris, water reclamation maintenance manager, who leads the mechanical, electrical and instrumentation group.

"It was nice to be part of decisions about the equipment that's being added and to be able to share our experience with what was previously here and what works well on the instrumentation and mechanical side. Our team will have a chance to learn about the new equipment and get some good train-

ing from the contractors. We're happy that we're going to get some new equipment that will have a better life span without any problems."

Doug Chapman, water reclamation operations manager, adds, "It has been very beneficial for us to be in from the start, looking over the drawings and giving our comments. We had regular weekly meetings and additional meetings in groups that covered all our shifts.

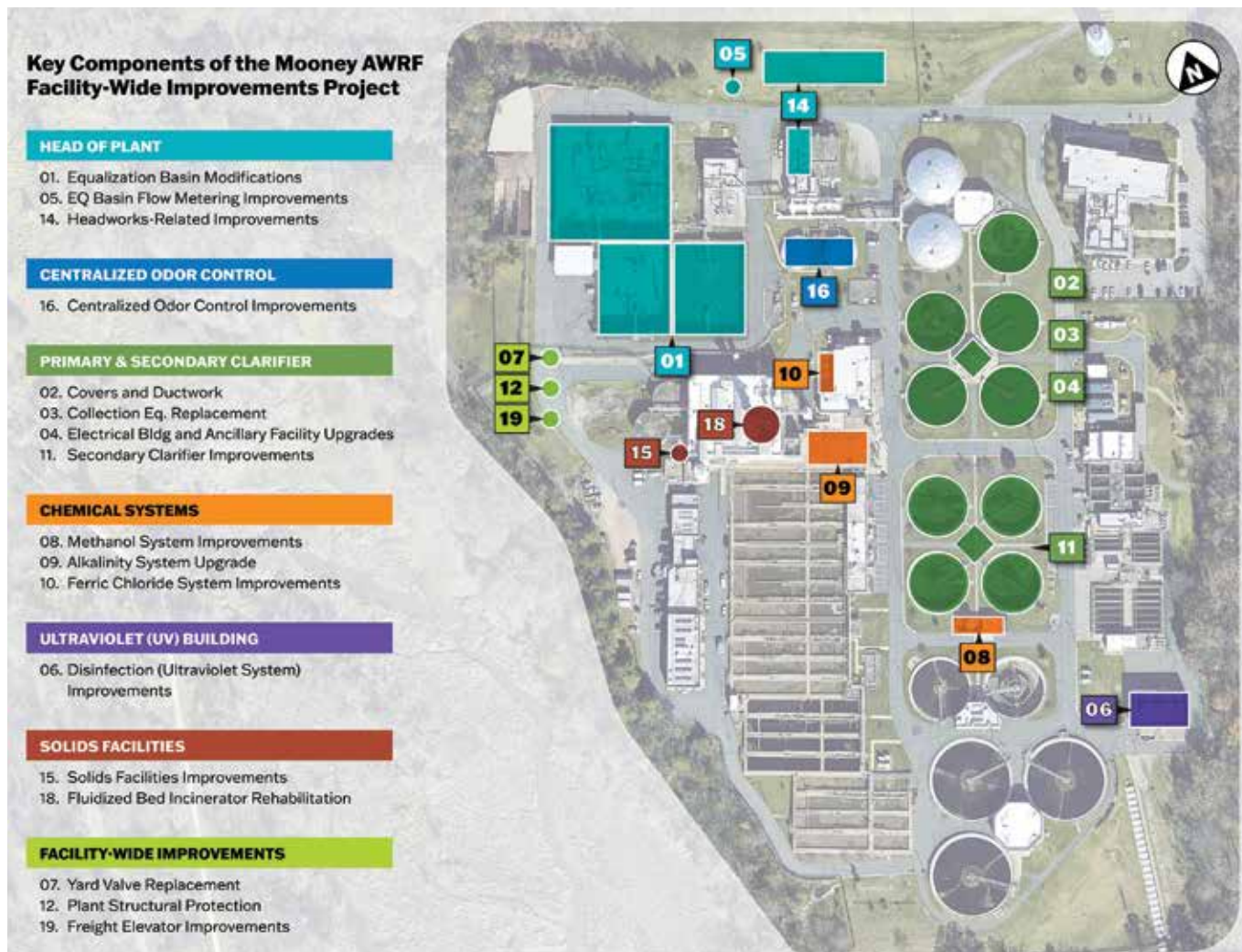
"The drawings were in the control rooms to review, and we were able to comment from experience on what we have found works or doesn't work here. The operators are really glad that their comments are being heard and considered. We very much look forward to seeing the new equipment come in and the improvements from the headworks to the UV."

He envisions the plant upgrade making life easier for the operations team. One example is the alkalinity system by which lime is fed to primary clarifier effluent. The existing labor-intensive and high-maintenance lime slaking system will be replaced by an automated process that feeds a liquid lime slurry.

MOVING AHEAD

O'Shaughnessy adds that input from O&M teams is important for integrating new equipment with the process: "The new design will be much more seamless with the existing plant as a result. It's very impressive how seriously the staff took the review of the design and providing detailed input. It's a better project having them on the team."

Next on the project schedule is finalizing the design for construction, and O&M staff involvement will continue. Carlson observes, "The big piece will be maintenance of plant operations during construction. Obviously plant staff members have the most experience with what can happen and when. Their input into the construction sequence will be invaluable." **tpo**



The H.L. Mooney plant upgrade includes multiple projects, most notably a rebuilt headworks and an expansion and centralization of the odor-control system.

Third Time's the Charm

GENERATION THREE OF COMBINED HEAT AND POWER TECHNOLOGY MAKES BENEFICIAL USE OF ALL BIOGAS FROM BIODIESEL PRODUCTION WASTE AND BIOSOLIDS IN SALEM, OREGON

By Steve Lund

A new cogeneration system will always have some kinks to iron out. That's true even for a utility with decades of experience at producing heat and power from biogas.

Since those kinks were worked out, though, it has been full steam ahead for the staff at the Willow Lake Wastewater Pollution Control Facility in Salem, Oregon.

The facility's third generation of a combined heat and power system went online in 2021.

"We did have a lot of challenges initially," says Jue Zhao, Ph.D., assistant director of public works. "We went through a challenging period, but now we're at full capacity all the time. We rarely flare methane at all."

The \$11 million project was financed in part by a \$3 million grant from the Energy Trust of Oregon and \$3 million more in a grant from Portland General Electric, the local power utility. The Oregon Department of Energy contributed \$250,000, and the project received energy efficiency and project development incentives totaling more than \$300,000 from the Energy Trust of Oregon.

USING THE BIOGAS

Before launching the new system, Salem was producing more biogas than its second CHP system could handle. So, the city replaced the old 650 kW



The new cogeneration facility at Willow Lake Wastewater Pollution Control Facility, Salem, Oregon.

“We went through a challenging period, but now we're at full capacity all the time.

We rarely flare methane at all.”

JUE ZHAO

generator with a 1.2 MW Caterpillar engine-generator in 2021. The new system also included equipment to remove siloxanes from the gas, a capability the previous system did not have.

The startup period was a little rough. "It's not like you turn it on and it's on," Zhao says. "It's a progression. We had a lot of challenges when we commissioned this unit." There was substantial downtime at first, but the generator ran 80% of the time from October 2021 to October 2022. By summer of 2023 it had been running more than 90% of the time for nine months.

"It was a cooperative effort between us and the manufacturer," Zhao says. "There was a lot of effort behind the scenes. We have very talented mechanical technicians, and the supervisors are great. They are making it work."

Salem blends high-strength biodiesel processing waste with biosolids to boost methane production. The staff has learned to tweak the mix for steady generator operation at maximum capacity.

The Salem staff is satisfied with the amount of electricity produced; it accounts for over 50% of the treatment plant's usage. Heat captured from the generator heats the anaerobic digesters and provides most of the heat for the plant administration and dewatering buildings.

SEASONAL SWINGS

The Salem sanitary and storm sewer systems are separate, but significant inflow and infiltration leads to substantial increases in wet-weather flow.

The Willow Lake plant (155 million gallon per day design) has an average summer flow of 30 mgd. In the wet months from October through May, peak hourly plant flows of 137 mgd can occur. During those months a second facility, the River Road Wet Weather Treatment Facility, is brought online and handles additional flows of up to 50 mgd.

The Willow Lake plant has a full-time staff of 52 including the laboratory. The lab also serves the Operations Division, which includes drinking

The new combined heat and power system at the Willow Lake wastewater treatment plant included installation of Clean Methane biogas scrubbers.

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water, watershed and environmental services, and other departments. Bio-solids from the anaerobic digesters are dewatered in centrifuges (Andritz) to about 23% solids and then are spread on farmland.

ENERGY-SAVING CULTURE

As could be expected from a utility that has operated co-generation equipment since the 1960s, Salem has substantial experience with energy conservation. Several years ago, the plant went through a Strategic Energy Management program with an energy adviser sponsored by Energy Trust of Oregon. Now the plant team is preparing to go through a similar process again.

“We were in that program several years ago, and they graduated us in 2019,” Zhao says. “We implemented everything. It’s ongoing. It’s part of the culture of the plant to identify energy savings and to reduce usage as much as we can.”

Among the changes implemented so far are upgrades to the secondary treatment aeration system in the biological treatment process. That work included a high-efficiency turbo blower (APG-Neuros) and membrane disk fine-bubble diffusers (Sanitaire, a Xylem brand).

POSSIBLE EXPANSION

The staff at Salem is considering adding another generator. The availability of high-strength food waste for co-digestion makes that an interesting prospect, although finding grants may be difficult.

“It’s kind of a chicken-and-egg thing,” says Zhao. “We have people coming to us with high-strength waste, and we don’t have the capacity to use the methane that would be produced. But if we propose adding another generator, people say we don’t have the methane to operate it.”

There is enough digester capacity to accommodate more food waste, so the chicken-and-egg problem could get resolved by saying yes to both additional food waste and another generator. When the Caterpillar engine-generator was installed, space was allocated for an additional unit.



A 1.2 MW Caterpillar engine-generator drives the latest version of a combined heat and power system at the Willow Lake plant.

Although producing biogas, cleaning it up for engine-generator fuel and producing electricity take staff time and attention, it’s integral to work at a plant. “It’s not a distraction,” says Zhao. “It’s beneficial. If we can produce and use electricity, it helps us to achieve a self-sustaining facility, which is one of the long-term goals that we set internally.” **tpo**

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Reclamation district implements phosphorus removal to achieve strict environmental standards

Problem

The Fox River Water Reclamation District in South Elgin, Illinois, needed to comply with an NPDES permit requiring a reduction of phosphorus discharges.

Solution

Black and Veatch provided a comprehensive feasibility study of the district's three water reclamation facilities and reviewed multiple nutrient removal processes. The district chose biological phosphorus removal along with **MagPrex**, a system from **Centrisys/CNP** able to precipitate phosphorus in the biosolids stream as struvite and substantially reduce soluble phosphorus in the digested solids stream and plant effluent.



RESULT:

Implemented in 2021, the system consistently removes over 90% of orthophosphate in the solids stream and improved dewatering: cake total solids increased from 13% to 16%. Ed Brown, operations superintendent, commended the system, emphasizing exceptional dewatering performance. 262-747-2384; www.centrisys-cnp.com

Filtration system helps dairy operation get runoff under control

Problem

Raw manure from dairy operations challenged to a Wisconsin county, creating significant nutrient runoff, digestate transportation expense, and the risk of anaerobic degradation in the open lagoons, emitting methane and contributing to global climate change.

Solution

After laboratory and pilot scale studies the **Scepter technology** from **Graver Technologies** was chosen. This crossflow filtration technology combines 316 L porous stainless steel tubes with a sinter-bonded titanium oxide membrane. Modules were incorporated to concentrate the solids from the digester. The technology withstands the aggressive cleaning and provides long-term economical operation.



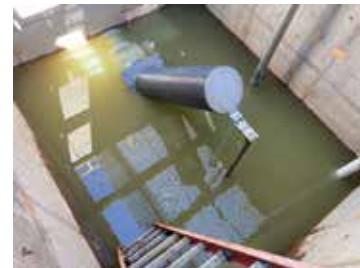
RESULT:

Scepter is deployed in state-of-the-art treatment plant designed to process nearly 1 mgd of digested dairy manure and return over 400,000 gpd of clean water to the environment. It reduces digestate volume to store and helps farmers better manage the application based on weather conditions and achieve optimal crop nutrient uptake. The process enables capture of methane for conversion to renewable natural gas. 888-353-0303; www.gravertech.com

MBBR allows facility to handle the increased flow capacity

Problem

A small but fast-growing city in New Jersey needed to expand its wastewater treatment plant capacity. One requirement was to keep the existing plant in service during construction. The design also had to consider a limited budget based on state revolving fund financing. Site limitations did not allow for an additional activated sludge train.



Solution

The client, consultant and **Headworks International** chose an integrated fixed film activated sludge process, which reduced the tank footprint by 50%. The moving bed bioreactor media shortened retention time by half so reduced the reactor load dramatically.

RESULT:

The dramatically reduced retention time delivered the needed capacity increase within the space limitations. The system also produces less biosolids, reducing costs greatly. 713-647-6667; www.headworksintl.com

Venturi sidestream injection brings ozonation to treatment plant

Problem

The Geren Island Water Treatment Plant in Salem, Oregon, draws its supply from the North Santiam River. In 2018 that source had elevated concentrations of cylindrospermopsin and microcystin, which appeared earlier than in previous years.

Solution

Ozone was chosen as the best treatment option. The water goes through the primary slow sand filtration to remove cyanobacteria, a primary source of cyanotoxins. Remaining cyanotoxins are then destroyed by ozonation. Ozone also breaks down other contaminants that could impart taste and odor, improves secondary filtration, and reduces chlorine usage for disinfection. To optimize performance, ozone is forcefully mixed with source water. For mixing and ozone contact, venturi sidestream injection from **Mazzei Injector** was chosen for effective control and thorough mixing and contact capabilities in a small footprint.



RESULT:

The Frank Mauldin Ozone Treatment Facility, coupled with expanded filter capacity, enables Salem to meet its water quantity and quality needs for today and the future. 661-363-6500; www.mazzei.net

Nanobubble generator reduces surfactants at recovery facility

Problem

The 9.5 mgd Goleta Sanitation District Water Resource Recovery Facility near Santa Barbara, California, faced high surfactant concentrations due to low-flow drought conditions and pandemic-level surfactant use. The surfactants made biological treatment inefficient and expensive, risking permit violations. The district faced millions of dollars in upgrades to address the problem conventionally.

Solution

The facility piloted the **NBG 6 nanobubble generator** from **Moleaer** after learning about its successful surfactant removal at a nearby facility.



Nanobubbles produce hydroxyl radicals that partially oxidize the surfactants and FOG in wastewater and reduce upsets in the biological process. The NBG 6 was installed between the headworks and primary clarifier to treat dreggited and screened wastewater.

RESULT:

In a three-month pilot the technology removed 40% of total quaternary ammonia compounds, 54% of total nonionic surfactants, and 51% of total anionic surfactants from raw influent. Aeration power draw was reduced by 43% and chemical costs and odor fell while TSS removal at the primary clarifier increased by 10%. The disinfection process saw chlorine demand fall 43%, and the facility was able to discontinue its bioaugmentation program. The nanobubble system reduced operation and maintenance costs by \$87,000 per year and produced better-quality effluent. 424-558-3567; www.moleaer.com

Water reclamation facility employs phosphorus management for nutrient recovery and equipment protection

Problem

In designing a new anaerobic digestion and dewatering facility, the Michigan city of Grand Rapids also wanted to protect process equipment downstream of the new digester from struvite scaling, break the recycle loop of phosphorus back to the plant, and recover phosphorus for beneficial use. With limited space available and specific project requirements, the city needed a customized and multifaceted solution.

Solution

Schwing Bioset met the challenges with a two-stage phosphorus management system using **NuReSys technology**. The first stage drives crystal formation downstream of anaerobic digestion, lowering struvite-forming potential and preventing dewatering equipment scaling. The second stage used on post-dewatering centrate adds struvite crystallization and harvests the struvite from the centrate stream for beneficial use.



RESULT:

The system operates continuously with side-stream treatment, protecting the plant from struvite buildup. It reduces the phosphorus return load and creates a marketable product. 715-247-3433; www.schwingbioset.com

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Geomembrane protects wastewater treatment plant

Problem

The Haikey Creek Wastewater Treatment Plant in Tulsa, Oklahoma, receives wastewater through 36-, 30- and 24-inch force mains. The Broken Arrow Municipal Authority needed a geomembrane for a flow equalization basin designed to reduce sanitary sewer overflows.

Solution

XR-5 geomembranes from **Seaman Corporation/XR Geomembranes** were chosen for durability and low thermal expansion and contraction.

The membranes are compatible with harsh liquids and offer high UV resistance and tensile strength. They can be prefabricated with fewer field seams than rigid alternatives, shortening installation time and cost and improving membrane integrity.



RESULT:

These properties along with toughness from the base fabric enable the authority to leave the liner exposed so that there are lower construction and operating costs and no slope maintenance. 800-927-8578; www.xrgeomembranes.com

(continued)

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case studies *(continued)*

TREATMENT, FILTRATION AND STORMWATER

Customized solution provided to treat varying water quality

Problem

The Illinois city of Lexington needed of a new water treatment plant as residents were experiencing tinted water caused by organic materials. Water is sourced from multiple wells, creating unstable water quality.

Solution

A customized solution was provided by **Tonka Water, a Kurita Brand** for the removal of TOC, iron, manganese and hardness. It includes a fully automated combination of four processes from a single manufacturer.



Treatment begins with forced-draft aeration, providing iron oxidation. Water then flows to detention, allowing time for the iron to oxidize. Next comes an OptaCell Plus pressure filter for removal of iron and manganese. The filter, with isolated cell compartments above and below the underdrain, enables individual cells to be backwashed or taken completely offline while the others remain in service. Each cell includes the Simul-Wash backwash system, which reduces backwash waste and lowers costs. In the next stage water flows through four RidION ion exchange softener vessels to treat water hardness, followed by an Organix system for TOC removal before distribution.

RESULT:

The Lexington plant is meeting expectations since commissioning in 2017. 866-663-7633; www.kuritaamerica.com

Dredge helps improve water quality in lake

Problem

Outbreaks of blue-green algae in a 1,616-acre natural lake created a call to action in Powers Lake, North Dakota. The water analysis measured the lake as hypereutrophic. Meeting state water quality standards required reducing nutrient loads to Powers Lake by 75% and nutrient cycling within the lake by 50%.

Solution

Agricultural producers adopted soil and water conservation Best Management Practices. Data showed that their efforts significantly reduced nutrient loadings to the lake, but blue-green algae blooms continued. In 2015, the city bought a **SRS Crisafulli Rotomite hydraulic dredge**. For seven seasons it has been used to dredge nutrient-heavy sediments from the lake.



RESULT:

The combination of dredging and conservation activities proved highly effective in enhancing water quality. 800-442-7867; www.crisafullipumps.com tpo



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OZ Lifting XR Series davit cranes

OZ Lifting Products has launched its XR Series of davit cranes for wastewater and water operators. The Winona, Minnesota-based manufacturer has released the model in 500- and 1,000-pound capacities, but the long reach of the range is a standout benefit for operators. Where other davit cranes typically have reduced capacity when it is in the longest reaching position, this series maintains its maximum capacity rating in all configurations. This means wastewater and water professionals can lift more weight further out, which presents many benefits for numerous lifting and material handling applications. The smaller crane weighs only 57 pounds and the larger crane weighs 95 pounds. Both have a maximum 62-inch reach and maximum hook height of 87 inches.

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www.ozliftingproducts.com



SmartSights helps utilities reduce downtime and lessen costs

For 30 years, WIN-911 and SyTech have been trusted partners to protect critical infrastructure and plant health. The two have joined forces to form SmartSights, delivering insightful and innovative solutions in data-driven analytics, reports and notifications. From building more resilience into water and wastewater facilities, to delivering analytics through industrial and compliance reporting, it's helping users shave millions off overtime and downtime costs. By providing comprehensive insight into critical infrastructure management, SmartSights enables swift problem resolu-

product spotlight

water

Analyzer keeps chemical dosing under tight control

By Craig Mandli

Water quality is a global concern that affects the health of the entire ecosystem. That's why municipalities need to rely on scientific water measurement tools, water testing equipment and chemical reagents to provide clean, safe water to the public.

The **MCX (Monochloramine Analyzer)** from **HF scientific, a Watts brand**, was designed to measure and report the concentration of monochloramine and ammonia in water samples over specified ranges. The instrument uses the modified phenate method to test for potentially unhealthy concentrations of monochloramine and ammonia. When a continuous process stream of water is flowing through the unit, it will take samples at preset intervals and display the readings. Reporting is made easy with a built-in display/control screen, along with standard 4-20mA outputs or Modbus communication outputs for instant data transfers.

"It features a simple design that is easy to install, use, and maintain, with no complex calibrations or reference solutions needed," says Lisa Stich, marketing manager for Watts. "It is quite easy to set up, calibrate, and start up, especially with startup support from our factory at no extra charge."

The MCX accurately measures monochloramine up to 10 ppm and total ammonia up to 2 ppm, while calculating Free Ammonia (NH₃-N) up to 2 ppm. These customizable units report monochloramine and ammonia values in ppm or mg/L, with manual and auto modes with adjustable time between mea-



MCX from HF scientific, a Watts brand

surements. They feature standard 4-20mA output communication, and are compatible with a sequencer for a multistream analyzer. It is required to replace the reagents every 30 days for continuous operation. Downloadable readings, error logs and calibration data can be transferred to an external micro USB. It is CAN/CSA and UL certified and is housed in a NEMA 4X Enclosure.

"It features simple fluidics, with only three reagents required to operate; making it a nearly maintenance-free sample and reagent feed system," says Stich. "A proven, reliable reagent pump system and optical assembly from our CLX Chlorine Analyzer make up the core components of the MCX."

According to Stich, HF scientific spared little expense and research and development resources in confirming the accuracy and dependability of the analyzer as well. "Testing took several years, including 1 1/2 years of pilot trials alone," she says. "Its design included the extensive voice of our customers and robust in-house and field testing. We're getting great feedback on the MCX Analyzer's performance from installations across the country."

888-203-7248; www.hfscientific.com

tion, waste reduction and cost efficiencies, elevating operational performance. If you're not already using remote alarming or a robust reporting tool, try a 30-day free trial. 512-326-1011;

www.smartsights.com



Endress+Hauser Micropilot 80 GHz radar sensors

Endress+Hauser has launched its new generation of Micropilot 80

GHz radar sensors: FMR60B, FMR62B, FMR63B, FMR66B and FMR67B. The sensors are suited for challenges when measuring points aren't easily accessible, located in dusty areas and harsh environments with extreme process temperatures and process conditions. They come equipped with wizards which operate via multiple HMI formats, including the SmartBlue app, and make the sensors easier to use. The measurement performance of the new radar chip combined with the new Heartbeat Technology monitoring function helps to increase productivity. The HistoROM mobile data memory transfers measuring point parameters without error when the electronics are replaced. The device

is repaired quickly and smoothly without requiring specialized user knowledge.

888-363-7377; www.us.endress.com



BinMaster Flow Detect 2000 sensor

BinMaster's Flow Detect 2000 improves bulk material handling by detecting plugged chutes and clogged or empty conveyors. It can tell if a slide gate is open or closed. When mounted in a distributor, it will know if material is flowing or not, prevent-

ing cross-contamination if the flow has completely stopped. The sensors help ensure an essential ingredient flows into a process for better batch control. Flow Detect sensors use Doppler Technology to sense flow and no-flow conditions in a bulk material system. The device is now approved to North American CSA/US Class II, Division 1 Groups E, F & G as well as European Union ATEX Zone 21 hazardous locations.

800-278-4241; www.binmaster.com



IDEC Corp. RC Series printed circuit board

The new RC Series printed circuit board relays from IDEC Corp. come in several low-profile configurations, provide high-capacity power switching, and perform reliably even in challenging environments. The RC Series replaces and upgrades the RJxV Series PCB mount relays. The RC Series is designed to mount directly to a PCB using through-holes, and can be wave-, dip-, robotically or hand-soldered. The configuration provides a low-profile height of 0.65 inches or less, with high voltage and current ratings in relation to their size and weight. The relays are designed to operate from minus 40 to 185 degree F, with a lifetime of 20 million operations (at 18,000 times per hour) unloaded, or at least 100,000 times at rated load.

800-262-4332; www.idec.com



Franklin Electric FE Connect app

Franklin Electric added an enhancement to its FE Connect app that is designed to help professionals quickly set up and service Franklin Electric products equipped with wireless connectivity. The app supports some of the company's variable-frequency drives, including

SubDrive Connect, SubDrive Connect Plus, SubMonitor Connect and select configurations of Cerus X-Drive. The app offers an array of startup, monitoring and troubleshooting solutions, including in-app guidance when setting up products, access to over-the-air firmware updates for effortless upgrades, and visibility into real-time product status. Engineers and water system professionals can also create and manage templates to easily save and load configurations across installations. The app helps preserve VFD integrity, allowing users to perform tasks and troubleshoot with minimal hands-on interaction with the drive.

866-271-2859; www.franklinwater.com



FCI ST80 digester gas flowmeter

The rugged ST80 Series thermal flowmeter from Fluid Components International provides precision mass flow measurement. With its lack of moving parts and simple insertion-style design, and comprehensive, global HazEx approvals, the ST80 is an ideal solution for digester gas flow measurement. The meter combines feature-rich electronics and FCI innovations such as Adaptive Sensing Technology with an extensive selection of application-matched flow sensors, including FCI's wet gas flow element, to provide a solution for moisture-rich digester gas applications. The ST80 meter further combines these features with a robust, rugged transmitter enclosure and process connections to provide long service life and ease-of-installation in the installation's pipe or duct. Its insertion style configuration for wastewater digester gas is a single-point meter for pipe diameters greater than 2 inches. It operates over a wide flow range: 0.25 to 1,000 standard feet per second.

800-854-1993; www.fluidcomponents.com

(continued)

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SAF-T-FLO retractable injection quills are designed to provide a maintenance friendly way of maintaining injection feeds prone to scale and clogging.

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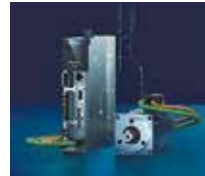


Asahi/America Series 19 actuation line

Asahi/America recently expanded its Series 19 electric actuation line. The Series 19 MAV MultiPack multiturn actuator features accelerated cycle times ranging from 13 to 100 seconds and a smart feature that tracks the number of completed cycles. Like all Series 19 actuators, The Series 19 MAV MultiPack comes standard with multi-voltage capability, a visual position indicator, an LED light to indicate valve position or fault and auxiliary contacts. Controlled by firmware, the MultiPack is available in two packages as an on/off or modulating unit. It mounts on Asahi/America

Type-14 diaphragm valves and gate valves up to 4 inches. It includes a heater, one set of dry contacts for PLC confirmation and one for alarm reporting, an OLED screen with push buttons, local controls and a QR code for easy and instant access to user manuals.

800-343-3618;
www.asahi-america.com



Siemens SINAMICS S200 servo motor

Siemens new SINAMICS S200 servo consists of a SINAMICS S200 drive and SIMOTICS S-1FL2 motor with standard or flexible cable options. The pulse train version allows a wide range of installed

machines to easily integrate additional positioning axes using the onboard positioner. And a dynamic networking capability to motion control, SIMATIC PLC, expands its system capabilities in the PROFINET version. With a power range up to 7 kW including low-, medium- and high-inertia offerings the 1FL2 permanent magnet motors with 17- or 21-bit encoders expand the performance, as well as scale to the widest range of standard servo requirements. SINAMICS S200 is included in the SINAMICS DriveSim Basic model and enables users to create a digital twin of the drive and PLC communication in the planning phase on a project to ensure proper sizing and operation of the equipment in use.

800-365-8766; www.siemens.com
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product spotlight wastewater

Turnkey oxygen infusion answers rising chemical costs

By Craig Mandli

The municipal wastewater treatment sector is not immune to inflation. Over the last couple years, the cost of popular water treatment chemicals, such as calcium nitrate, has increased dramatically. Supply chain problems also can cause major delivery issues, leading to disruptions in the treatment process. **Anue's Total Solutions** service is designed to eliminate the capital expense, keeping costs within a municipality's monthly operating budget.

The turnkey oxygen infusion service essentially replaces costly chemicals with eco-friendly oxygen/ozone systems for municipal wastewater treatment and odor/corrosion control at a manageable monthly fee to substantially reduce monthly operating costs by a minimum of 20%, according to Anue's VP and General Manager Greg Bock. Onsite oxygen production, fed to the force main, eliminates hydrogen sulfide generation at the source.

"With Anue Total Solutions, a municipality can immediately push its monthly spending on wastewater treatment below what it currently spends for chemicals," says Bock. "That's because Anue retains ownership of the equipment. ATS is a turnkey program, with Anue, and its local channel partners handling the setup and maintenance."

According to Bock, the idea was born out of interest in the company's mobile demonstration units designed to show potential customers the benefits of installing a FORSe oxygen system — an eco-friendly approach



Anue's Total Solutions

to mitigate hydrogen sulfide-related odors and corrosion in wastewater collection systems like force mains and lift stations. The systems are regulated by Flo Spec Control Software — a fully SCADA-compliant program that allows for bidirectional monitoring and control of each system with access to Wi-Fi.

The popularity of those mobile demonstrations led the company to conduct a feasibility study on the potential popularity of what would be, essentially, a subscription service with setup and maintenance handled through Anue. The response to the idea among potential clients, says Bock, "made it easy to decide to pursue the project."

"This is a unique and innovative program which we believe will open the door for municipalities to start saving operating dollars and enjoy an easy-to-use, eco-friendly FORSe Oxygen infusion system," he says. "Of course, if a municipality prefers an outright purchase of a FORSe system, we are happy to accommodate. The ATS service is in addition to a regular purchase option, to make it easy for all municipalities."

760-727-2683; www.anuewater.com



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EB45

Treatment, Filtration and Stormwater

By Craig Mandli

Aeration Equipment

SANITAIRE - A XYLEM BRAND SILVER SERIES II

The Silver Series II aeration system from Sanitaire - a Xylem Brand is a diffused aeration and advanced biological wastewater treatment solution that offers efficiency and is ideal for biosolids and other heavy-duty applications. The low-pressure version handles airflow up to 20.4 Nm³/h with minimal pressure loss. Its pipe joints are designed to withstand thermal expansion and contraction, water hammer and other dynamic stresses, while pipe supports allow infinite height adjustment for accurate grid leveling. **855-995-4261; www.xylem.com/sanitaire**



Silver Series II aeration system from Sanitaire - a Xylem Brand

Blowers



ZZ Series blowers from Eurus Blower

EURUS BLOWER ZZ SERIES

ZZ Series blowers from Eurus Blower are drop-in replacements for competitor blowers. They have heavy-duty cast housings, machined impellers, alloy steel shafts with oversized bearings, hardened/precision-machined steel forged gears, oil-lubricated gear and/or grease- or oil-lubricated drive sides, plus keyless locking assemblies for easier timing gear maintenance. The blowers provide up to 15 psig pressure and 2,350 cfm flow. **918-361-0285; www.eurusblower.com**

KAESER ROTARY SCREW BLOWERS

Low-maintenance blower technology can help minimize power costs with load splitting, sequencing and superior multiblower controls. KAESER rotary screw blowers are turnkey systems, available in sizes up to 335 hp and flows to 5,650 cfm, using up to 35% less energy than conventional rotary blowers, while energy savings of up to 15% can be achieved in comparison with turbo blowers. All blowers come complete with noise-insulated cabinets, inlet and outlet silencers, motors and drives. The intelligent Sigma Control 2 on each blower optimizes machine performance via various control modes, and a full suite of sensors provides active condition monitoring to protect the machine. The combination of a blower air-end with high-efficiency SIGMA Profile rotors, flow-optimized components, efficient power transmission and drive components, ensures wire-to-air performance year after year. **866-516-6888; www.us.kaeser.com**



Rotary screw blowers from KAESER

TMC FLUID SYSTEMS AERATION BLOWERS

TMC Fluid Systems offers blowers for aeration in wastewater treatment plants. For midrange applications, where desired flow rates required range between 500 to 2,000 cfm, and where required differential pres-

ures can range from 2 to 10 psi(g) and beyond, a twin-lobe or tri-lobe blower package is ideal. Where fit-and-forget is the industry mantra, these blowers are capable of operating 24 hours a day, seven days a week with minimal need for maintenance. They are versatile and can handle extreme temperature fluctuations. They work well in the desert as well as in frigid temperature and will handle anything in between. **949-269-1472; www.tmcfluidsystems.com**

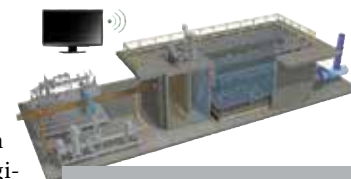


Aeration Blowers from TMC Fluid Systems

Filtration Systems

LEOPOLD - A XYLEM BRAND OXELIA

Oxelia from Leopold - a Xylem Brand is an ozone-enhanced, biologically active filtration system and multi-barrier solution for municipal wastewater treatment. It breaks down and removes contaminants including taste and odor-causing geosmin and CECs. The system can be configured precisely for a water matrix, energy and regulatory requirements for a cost-effective solution. The system's oxidation step uses ozone and ozone-based Advance Oxidation Process, or UV-based AOP, to break down organic carbon compounds into smaller, biodegradable components while providing an oxygen-saturated water. It combines ozone, filtration and analytical instrumentation to deliver optimal wastewater treatment for water reuse and discharge into sensitive waters. **855-995-4261; www.xylem.com/leopold**



Oxelia filtration system from Leopold - a Xylem Brand

ORENCO SYSTEMS ADVANTEX AX20-RTUV TREATMENT SYSTEM

The AdvanTex AX20-RTUV Treatment System from Orenco Systems is a self-contained module that treats typical septic tank effluent to better than secondary standards, with nitrogen reduction and ultraviolet disinfection. It is especially suited for small sites with poor soils or that require shallow burial. It helps protect surface waters and aquifers and is an effective solution for areas that have strict discharge limits. It is installed following a septic tank equipped with Biotube Effluent Filters. The unit eliminates the need for separate recirc, treatment, discharge and disinfection tanks and basins and reduces the number of risers and lids needed in the treatment train. **800-348-9843; www.orenco.com**



AdvanTex AX20-RTUV Treatment System from Orenco Systems

SPENCER STRAINER SYSTEMS SELF-CLEANING FILTERS

Spencer Strainer Systems self-cleaning filters screen remove oversize particles from process or wastewater flows of up to 2,500 gpm without filter elements or bags. Models of various sizes are available for continuous process flow of up to 2,500 gpm. Wedgewire or perforated screens of various openings are available and interchangeable, allowing one strainer to be used for multiple applications. With no bags or elements to dispose of, this technology allows users to meet facility sustainability goals. Systems are a reliable, cost-effective solution for process or wastewater screening applications in a wide range of industries. **800-801-4977; www.spencerstrainer.com**



Self-cleaning filters from Spencer Strainer Systems

FOG Controls

BYO-GON PX-109

Byo-Gon PX-109 is a nontoxic, non-corrosive and 100% organic and biodegradable alkaloid compound used for eliminating grease, sewage odor and hydrogen sulfide from restaurant grease traps, lagoons and municipal sewage systems. As a stimulant to enzymatic activity at the cellular level, it promotes more rapid cell growth and consumption of organic material, overcoming limiting environmental factors to stabilize wastewater systems. Its use promotes healthy biological systems, preventing the need for large capital expenditures, as well as reducing costs. It is organically certified by OMRI. **888-296-4661; www.byogon.com**



Byo-Gon PX-109 treatment

NEXT FILTRATION NEXT-F.O.G.STOP

Next Filtration's Next-F.O.G.Stop is molecular kinetic technology that optimizes aerobic MLSS operation and increases wastewater throughput up to 40%. It promotes biostimulation of indigenous microorganisms through the uncoupling of microbial metabolic pathways. Trials demonstrate that it amplifies the metabolic rate of organic carbon degradation and lowers the amount of biomass produced.



Next-F.O.G.Stop technology from Next Filtration

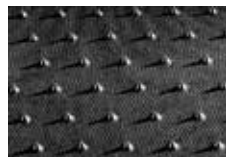
The excess carbon is metabolized and off-gassed in the form of carbon dioxide rather than being converted to

biomass or biofilm. Specifically, results show feeding it into the inlet stream of municipal and industrial wastewater facilities led to a decrease of biological oxygen demand and total suspended solids, and an increase of dissolved oxygen. Indirectly, this leads to reduced energy consumption, due to reduced aeration blower rates. **800-783-0310; www.nextfiltration.com**

Geomembranes/Geosynthetics

AGRU AMERICA SUPER GRIPNET

For engineers designing with geomembrane liners where drainage and high interface friction are critical, Super Gripnet from AGRU America can be combined with a geotextile to create an integrated drainage system. It can be easily configured with a geotextile to offer a superior drainage and interface friction solution with significant logistics and installation cost reductions. When part of an integrated drainage system, machined upward-facing studs and bottom-facing asperities provide high flow rates, reliable drainage capacity, a high-friction surface, superior slope performance, up to 15% faster installation and substantial cost savings. It has been deployed as a solution in over 150 million square feet across North America, supporting landfill closures, containment facilities, oil and gas applications and mining reclamation. **843-546-0600; www.agruamerica.com**



Super Gripnet liner from AGRU America

Groundwater Remediation/Treatment

ATLANTIC ULTRAVIOLET MEGATRON GERMICIDAL ULTRAVIOLET DISINFECTION SYSTEM

Large-scale industrial/municipal water and wastewater applications can benefit from the MEGATRON Germicidal Ultraviolet Disinfection System from Atlantic Ultraviolet, which contains multiple UV-C lamps producing wavelengths lethal to bacteria and viruses. Four different models treat 90 to 450 gpm of clear freshwater (clear wastewater and high purity water are handled at other flow rates). Each model consists of a Type 316 stainless steel chamber with multiple UV-C lamps, making it completely self-contained. Units can be plumbed together to handle larger water flow requirements. A newly available remote electrical enclosure features an HMI touchscreen, water temperature monitoring, and UV-C intensity monitoring. Additional standard features include a sight port for viewing lamp operation, digital lamp operation indicators, an elapsed time indicator and removable chamber heads. It is available with manual or automatic wiper systems to clean quartz sleeves around each lamp. The Model M250 meets Environmental Technology Verification Program standards. **631-273-0500; www.atlanticultraviolet.com**



MEGATRON Germicidal Ultraviolet Disinfection System from Atlantic Ultraviolet

HACH DR1300FL

The DR1300FL with fluorescence generating technology from Hach offers easy-to-perform, ultra-low range solutions for free or total chlorine and sulfite. It is reliable, accurate, precise and easy to use while providing critical single digit part per billion level chlorine and sulfite control. It can reliably detect chlorine down to 2 parts per



DR1300FL meter from Hach

billion with its ultra-low measurement range and reliably detect sulfite between 6 and 500 parts per billion with its capable and accurate sulfite test. Accurate and stable part per billion level measurements allow optimization of dechlorination systems with the potential to reduce RO biofouling, save on dechlorination chemicals and extend the potential life of RO membranes. **800-227-4224; www.hach.com**

Lagoon Products

GLASDON GUARDIAN LIFE RING CABINETS

Designed to keep lifesaving devices safe and ready for action in the event of an emergency, Guardian Life Ring Cabinets from Glasdon are not only sturdy and long-lasting, but also resistant to corrosion, offering solid protection from the harshest weather all year round. They come in two sizes for USCG-approved life rings (24 or 30 inch), including models with and without the rings included. The secure toggle latch ensures easy access when needed, while built-in security features help protect against theft or damage and reduce the frequency of costly life ring replacement. A Rope-master System enables fast deployment of the ring buoy and rope during an emergency. Cabinets can be mounted to a pole, wall or rail to meet specific requirements and provide rapid access to rescue equipment. They come equipped with decals to guide users in deploying life



Guardian Life Ring Cabinets from Glasdon

rings and throwing ropes. Additionally, more decals can be affixed to the outside for providing instructions and alerts, as well as exhibiting company or authority logos. 855-874-5273; www.glasdon.com

MBBR

FEDERAL SCREEN PRODUCTS MBBR SCREENS

Federal Screen Products custom fabricates MBBR Screens that maximize flow rates while containing biofilm carriers, helping save on maintenance costs. They are fabricated with wedge wire by resistance welding V-shaped wire on shaped support rods. These thousands of fused points create a honeycomb-like structure that provides a strong and accurate continuous slot. This results in a product that provides accurate flow, distribution and effective media and debris filtration and retention. Wastewater screens are available in a wide range of profile wires to suit most systems, and can be designed in flat, curved or cylindrical form to meet customers' drawings and specifications. Robust for vertical wall applications, screens are also self-cleaning when designed to the flow rate and are passivated in-house, which allows for a quality of finish, extending product life. 905-677-4171; www.federalscreen.com



MBBR Screens from Federal Screen Products

Media Filters

AQUA-AEROBIC SYSTEMS AQUASTORM

The AquaStorm cloth media filtration system from Aqua-Aerobic Systems is an effective solution for wet-weather applications, including combined sewer overflow, sanitary sewer overflow and stormwater. The system uses a disc configuration and OptiFiber PF-14 pile cloth media, and it operates with three zones of solids removal to filter wet-weather flows without the use of chemicals. It is designed to handle a wide range of flows in a fraction of the space and offers simple startup/shutdown with unattended operation for remote locations. The system also allows for dual-use application for tertiary and wet-weather operation. 800-940-5008; www.aqua-aerobic.com



AquaStorm filtration system from Aqua-Aerobic Systems



FLUORO-SORB Adsorbent from CETCO Energy Services

CETCO ENERGY SERVICES FLUORO-SORB ADSORBENT

FLUORO-SORB Adsorbent from CETCO Energy Services is a highly specialized and NSF-certified adsorption media that is proven effective in treating a wide range of PFAS compounds. An engineered surface modification technology allows it to be resistant to competitive adsorption from other sediment and water contaminants. This feature ensures that the media efficiently binds across the entire spectrum of PFAS and is reliable. It comes in various forms allowing versatility in deployment across filtration, sediment capping, CETCO Reactive Core Mat, and in-situ remediation applications. With its precision-engineered design and strong track record, it has ideal adsorption capacity and fast kinetics, providing a cost-effective option for PFAS remediation applications of all scales. 800-527-9948; www.mineralstech.com

Membrane

MEMBRION CERAMIX

Membrion's CeramIX desalination membranes enable the fast and selective transport of ions and the recycling of up to 98% of harsh industrial wastewater. They stack hundreds of cation and anion electro-ceramic desalination membranes into modules. Multiple modules are used in endless configurations to create customized treatment for a variety of applications. Modules contain the thin, flexible, electro-ceramic desalination membranes for efficient and sustainable water recovery. The modules are integrated into the wastewater processes in the manufacturing of semiconductors, electronics, food and beverage, electric vehicle and other industries. There is minimal-to-no pretreatment. Water recovery occurs under extreme low pH ranges and in the presence of oxidizers. They remove challenging trace metals and minerals that cause scale formation. The modules are lower fouling, which means less frequent cleanings and longer lasting membranes. Electricity costs are reduced and ESG goals are supported. 206-502-1600; www.membrion.com



CeramIX desalination membranes from Membrion

Mixers

IXOM WATERCARE GRIDBEE AND SOLARBEE FLOATING WASTEWATER MIXERS

GridBee and SolarBee Floating Wastewater Mixers from Ixom Watercare are designed to solve a variety of municipal and industrial wastewater quality problems including high energy costs, EPA discharge permit violations and odor control. Not only can these powerful mixers operate 24/7 to improve overall treatment, they can also supply most of the mixing energy required in any treatment pond, which in turn can reduce the operational hours of the existing aeration/mixing system. Available power options include fully grid, fully solar and combined grid-solar. Applications include wastewater ponds, activated sludge, water reuse/effluent storage ponds and anaerobic ponds. 866-437-8076; www.ixom.com



GridBee and SolarBee Floating Wastewater Mixers from Ixom Watercare

JDV EQUIPMENT NOZZLE MIX SYSTEM

The Nozzle Mix System from JDV Equipment is a dual-zone mixing technology that provides uniform mixing patterns that produce even distribution and a stable environment. It can help optimize solids suspension and contact to promote efficiency in a wide range of applications. The system is designed with pumps installed outside the tanks to facilitate ease of maintenance. The pumps are typically chopper pumps or pumps incorporating in-line grinders that prevent fibrous materials from accumulating and causing plugging problems. The application dictates which type(s) of the many varied pump options can be used. The high-velocity nozzles are mounted inside the tank and are oriented to discharge in a flow pattern that completely mixes the tank contents. 973-366-6556; www.jdvequipment.com



Nozzle Mix System from JDV Equipment



**Thickening
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Nutrient Removal

DUPERON FLEXRAKE IQ

The Duperon FlexRake IQ platform provides real-time smart screening for maximum resilience at the headworks. It tackles high peaking factors due to extreme weather and difficult debris like flushable wipes, first flushes and settled solids. This is accomplished by system improvements and a sequence of operations that automatically responds in real time to optimize the screen field. The reimagined design focuses on smart enhancements to the raking device to manage heavy solids loading events with four times increased debris removal capacity, improved grit and rock handling and greater solids capture. During peak flow conditions, it adjusts the bar screen opening itself to provide additional hydraulic capacity and safety factor, matching the best capture rate to the flow volume in real time. **800-383-8479; www.duperon.com**



FlexRake IQ screening system from Duperon

NEDERMAN MIKROPUL THIN FILM DRYER

The Thin Film Dryer from Nederman MikroPul is a versatile sludge dryer that can process all types of sludge, including digested, undigested, and industrial sludge, as low as 10% DS. It achieves a variable sludge dryness range of 30 to 95% DS, and the dryer has been successfully utilized for various appli-



Thin Film Dryer from Nederman MikroPul

cations such as Class A, landfilling, composting, alkaline stabilization, incineration, gasification, pyrolysis and solid fuel production. With a simple design, the dryer has a single-drive motor, requires no separate feed system, and generates less than 200 cfm of exhaust vapor, which can be easily treated. Its high-efficiency design consumes 1,150 to 1,300 Btu/lb of evaporated water and can recover up to 85% of this heat for other purposes, including digester and building heating. **704-398-7571; www.lcicorp.com**

PARK PROCESS SLUDGEKING II

The SludgeKing II roll-off dewatering container from Park Process incorporates an engineered design that eliminates trapped water in the bottom of the filter cake. The second center-wall filter increases filter area by 33% producing drier cakes in less time. The plastic floor panels that cover the floor space between wall filters and center wall filters serve three purposes. They hold down the bottom of the filter elements, help eliminate standing water and aid in filter cake dumping. The inlet manifold is split into three inlets, each with a ball valve, allowing incoming flow to be distributed evenly into the three compartments formed by the two center-wall filters. **855-511-7275; www.parkprocess.com**



SludgeKing II roll-off dewatering container from Park Process

SMITH & LOVELESS MODEL R OXIGEST

The Smith & Loveless Model R OXIGEST field-erected treatment plant achieves BOD/TSS, nutrient removal, and water reuse for flows up to 3 mgd in a single tank. Its concentric design with integral biolog-

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we're thinking about what we need to do

tomorrow to make the plant better.”

Frank Wallace
General Manager
Caryville-Jacksboro (Tenn.) Wastewater Treatment Plant

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product focus

Treatment, Filtration and Stormwater

ical treatment zones eliminates expensive sludge pumps and yard piping while minimizing installation expenses, land usage and construction time. Smart automation and remote intelligence really simplify maintenance and allow for a stable operation. It integrates high



Model R OXIGEST treatment plant from Smith & Loveless

performance components that offer advanced process control and automation throughout the plant's operation, and can be managed with the QUICKMART touchscreen PLC. Multiple internal zones can be employed to provide specific activated sludge processes for stringent treatment requirements, including biological nutrient removal and water reuse. Integral treatment process steps may include flow equalization, screening and fine grit removal, anoxic zones for nitrification-denitrification, tertiary filtration, disinfection, biosolids storage, or other specialized treatment. Systems can be designed for water reuse and direct or indirect discharge. **800-898-9122; www.smithandloveless.com**



SBRs

EVOQUA WATER TECHNOLOGIES OMNIFLO SBR MAX

OMNIFLO SBR MAX system from Evoqua Water Technologies

The OMNIFLO SBR MAX system with Jet Tech technology from

Evoqua Water Technologies combines the benefits of a true-batch SBR with those of a continuous-fill batch reactor process to treat wastewater influent flows to over five times design. The system optimizes hydraulic handling during storm flows, reduces equipment sizing and cost, and can trim energy costs over 15%. At low flow rates, the system operates in the true-batch mode, and during peak flow events, the system automatically switches to operating as a continuous fill batch reactor to dissipate peak flows and slash hydraulic overflow rates. It allows for the treatment of storm flows while maintaining excellent effluent quality. Quiescent settling is preserved at all flow rates up to storm flow. Influent velocity dissipation prevents sludge disturbance and short-circuiting. There is no need for additional EQ basins or oversized reactor basins. Simple automated controls make necessary adjustments easy. **800-466-7873; www.evoqua.com**

Water/Wastewater Reuse Systems

ALFA LAVAL AS-H ISO-DISC

Alfa Laval AS-H Iso-Disc cloth media filters provide tertiary filtration that with proper pretreatment can meet California Title 22 reuse standards, effluent turbidity of less than 2 NTU, and effluent TSS less than 5 mg/L. The design enables individual disk turbidity to be measured, and an operator can visually inspect the flow from each one. Also, if necessary, they allow an operator to isolate an individual disc for maintenance without disrupting the rest of the flow. The design can also be engineered to maximize the filtration area in the existing basin. **866-253-2528; www.alfalaval.us tpo**



AS-H Iso-Disc cloth media filters from Alfa Laval



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Anaergia appoints Brett Hodson as CEO

Anaergia has appointed Brett Hodson as chief executive officer succeeding the company's founder and chairman, Andrew Benedek. Benedek will continue to serve as chairman of the company's board of directors. Hodson was the president and CEO of Corix Infrastructure, a utility infrastructure company. Following his tenure at Corix, he founded Sunshine Pier Capital, a consulting and private equity firm.



Brett Hodson

Asahi/America opens new fabrication facility

Asahi/America opened its newly constructed Louisiana-based fabrication shop in Paulina with customers, partners, employees and local government officials in June. The new facility focuses on large-scale thermoplastic prefabrication and is known as Asahi/America — PPI, a division of Asahi/America. Construction of the 59,000-square-foot facility finished in late 2022 and will add over 36,000 additional square footage and will improve efficiencies of large-scale and complex prefabrication piping projects. Asahi/America initially expanded its fabrication capabilities and operational capacity during the acquisition of Performance Plastics 2018.



Patrick Ingle joins Triplepoint Environmental

Patrick Ingle has joined Centennial, Colorado-based Triplepoint Environmental as vice president of sales and marketing. He has 30 years' experience in the water and wastewater industry, with a strong focus on biological treatment systems. Ingle joins Triplepoint from William/Reid, where he served as general manager. He has held sales manager roles with Sanitaire, Carus Chemical Company, Hydroxyl Systems, Aeration Industries and the Water Technology Group.



Patrick Ingle

Hydro International acquired by Oldcastle Infrastructure

Hydro International has been acquired by Oldcastle Infrastructure, a CRH Company, a provider of building materials solutions. As part of the Infrastructure Products business, teams will now be even better equipped to help with critical infrastructure projects such as runoff reduction, smart monitoring, flood mitigation and wastewater grit removal. Hydro will continue operating per usual while leveraging and sharing CRH's resources. Processes for purchase orders and invoice payments will remain unchanged until further notice.

TriNova opens new Endress Core of Excellence Education and Wellness Center

Endress+Hauser sales and service representative partner of more than 20 years, TriNova, announces the completion of its Endress Core of Excellence Education and Wellness Center in Mobile, Alabama. The new 19,457-square-foot facility will create development opportunities for employees and fellow representative partners and improve networking capabilities. The center will house the company's Process Training Unit to assist in customer training and provide hands-on experience. In addition, TriNova will expand its offerings with an apprenticeship program for its areas of operation, also utilizing the PTU. Through this program, TriNova will connect students, parents, educators, counselors and industry experts to raise awareness and provide crucial information regarding technical career opportunities and the significance of STEM.

NETZSCH Pumps celebrating 150 years

NETZSCH is ringing in its 150th anniversary year and over 4,100 employees worldwide are joining in the celebration. The company is planning extensive celebrations this year, including at all major international locations. The company will share the various facets of its history with its workforce, customers and partners, as well as interested members of the public, in a magazine and an anniversary blog.

Franklin Electric celebrates 10th anniversary of its headquarters

Franklin Electric celebrated the 10th anniversary of its global corporate headquarters in Fort Wayne, Indiana. CEO Gregg Sengstack kicked off the daylong celebration by addressing the employees and cutting the anniversary cake. Throughout the afternoon, the employees enjoyed outdoor lawn games and the Fort Wayne Philharmonic played bluegrass music. An ice cream truck was on site, and food and beverages were also served to celebrate the milestone. Headquarter-based employees received a Franklin Electric memento to commemorate the event.

CST Industries celebrating its 130th anniversary

CST Industries, an international manufacturer of bolted glass-fused-to-steel and epoxy-coated tanks, aluminum domes and specialty covers, is marking 130 years this year. Since its inception in 1893, the Columbian Steel Tank Co., known today as CST Industries, has strived to provide longevity to all aspects of its market, including designing and manufacturing storage and cover solutions to meet any challenges.

Bill Panos and Sheilah Brous join Bentley Systems

Bentley Systems has appointed Bill Panos as senior director, North America transportation and Sheilah Brous as senior director, North America mobility. Panos will lead a dedicated team in driving the growth of Bentley's Enterprise Public Sector programs and transportation partnerships. Brous will focus on ensuring the delivery of best-in-class outcomes. She reports to Panos, who reports to Ken MacArthur, vice president, regional executive, Americas.



Bill Panos



Sheilah Brous

Operators Unlimited welcomes Amanda Kieffer as engineer and project manager

Operators Unlimited has hired Amanda Kieffer as wastewater process engineer and project manager. With almost ten years' experience in industrial manufacturing and environmental compliance, she brings a well-rounded view of wastewater processes that will support and benefit OU and OU customers. Kieffer holds a Bachelor of Science in chemical engineering from North Carolina State University. **tpo**



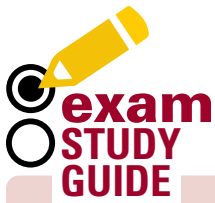
Amanda Kieffer

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WASTEWATER

By Rick Lallish

Hydrogen sulfide is oxidized to sulfuric acid by what bacteria, common in pipe walls in collection systems and lift station wet wells?

- A. *Nocardia*
- B. *Thiobacillus*
- C. *Thiothrix*
- D. *Autotrophicis*

ANSWER: B. Hydrogen sulfide has a lifecycle that goes from liquid to gas to liquid in certain conditions. Sulfates present in wastewater are changed to sulfide by bacteria in waterline slime layers. The flow splash and turbulence caused the H₂S gas to release. The gas is then oxidized by the *Thiobacillus* bacteria to corrosive sulfuric acid, which drips down the pipes and then changes back to sulfate in the wastewater stream. More information may be found in the OWP, CSU-Sacramento textbook: *Operation and Maintenance of Wastewater Collection Systems* (Eighth Edition), Chapter 5.

DRINKING WATER

By Drew Hoelscher

What chemical can be used in place of calcium hydroxide and sodium carbonate for softening?

- A. Sodium chloride
- B. Sodium sulfate
- C. Sodium hydroxide
- D. Calcium sulfate

ANSWER: C. Sodium hydroxide (caustic soda) can reduce carbonate and noncarbonate hardness. This method usually increases chemical costs and total dissolved solids when compared to calcium hydroxide and sodium carbonate. However, sodium hydroxide generally produces less sludge and is generally considered easier to handle than calcium hydroxide.

ABOUT THE AUTHORS

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Fairfax County Government Position Open: **Plant Operator II**. Location: Lorton, VA. Closes 9/29/2023. Apply online: <https://www.governmentjobs.com/careers/fairfaxcounty/jobs/4201458/plant-operator-ii?keywords=plant%20oper&pagetype=jobOpportunitiesJobs> (T11)

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Brandon Huston, superintendent of the Albert Lea Wastewater Treatment Plant, received the Minnesota Wastewater Operator Association's 2023 Outstanding Class A Operator of the Year award. Colleague **Cavit Wobschall** received the 2023 Outstanding Rookie Operator of the Year award.

The **Dallas Water Utilities' Southside and Central Wastewater Treatment Plants** earned Peak Performance Awards from the National Association of Clean Water Agencies.

The **Portland (Maine) Water District** received 2022 Peak Performance Awards from the NACWA for its Cape Elizabeth and Westbrook/Gorham Regional Wastewater Treatment Facilities.

Don Weingart retired after 71 years of service to the Salem (Ohio) Utilities Department. He began his career at age 17 in 1952, first serving 35 years in potable water treatment before being named utilities superintendent, a position he had held for the last 38.5 years. He was succeeded by **Butch Donnalley**.

William Nash, assistant public utility director for the Dare County (North Carolina) Water Department for the past four years, was promoted to director after the retirement of **Pat Irwin**.

State Representative **Cindy Ryu** received an Outstanding Legislator award from the Washington Association of Sewer and Water Districts.

Mathew Weaver was named director of the Idaho Department of Water Resources, replacing **Gary Spackman**, who retired after 14 years as director.

Jean Block was named chief executive officer of the Little Rock (Arkansas) Water Reclamation Authority.



“Our guys are the boots on the ground and the reason for our success. We let them learn hands-on, not just identify problems, but what to do, what to try, what’s the best solution. We trust people. That’s how we roll.”

Dan Langguth
Division Superintendent
Crystal Lake (Illinois) Wastewater Treatment Division

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events

Oct. 29-Nov. 1

North Carolina AWWA Section Annual Conference, Raleigh Convention Center. Visit www.nconewater.org.

Nov. 1

AWWA Best Practices for Distribution System Model Calibration webinar. Visit www.awwa.org.

Nov. 1-3

Nebraska AWWA Section Annual Conference, Younes Conference Center, Kearney. Visit www.awwaneb.org.

Nov. 2

Green Mountain Water Environment Association Fall Tradeshow, DoubleTree Hotel, South Burlington, Vermont. Visit www.gmwea.org.

Nov. 2-3

Missouri Water Environment Association Fall Tech, Stoney Creek Hotel, Columbia. Visit www.mwea.org.

Nov. 2-3

AWWA PFAS Roundtable: Navigating Legal, Financial and Technological Challenges, Hilton Chicago. Visit www.awwa.org.

Nov. 5-9

AWWA Water Quality Technology Conference, Sheraton Dallas. Visit www.awwa.org.

Nov. 15-17

AWWA Rate-Setting Essentials Seminar: Connecting Financial Planning, Cost-of-Service and Rate Design, Hilton Garden Inn Bayside, San Diego. Visit www.awwa.org.

Nov. 26-30

Florida AWWA Section Annual Conference, Omni Orlando Resort ChampionsGate. Visit www.fsawwa.org.



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Melissa Kahoun, Aqua Illinois, Area Manager, Kankakee and Will Counties
Joseph Donovan Regional Water Treatment Plant, Kankakee, Ill.

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