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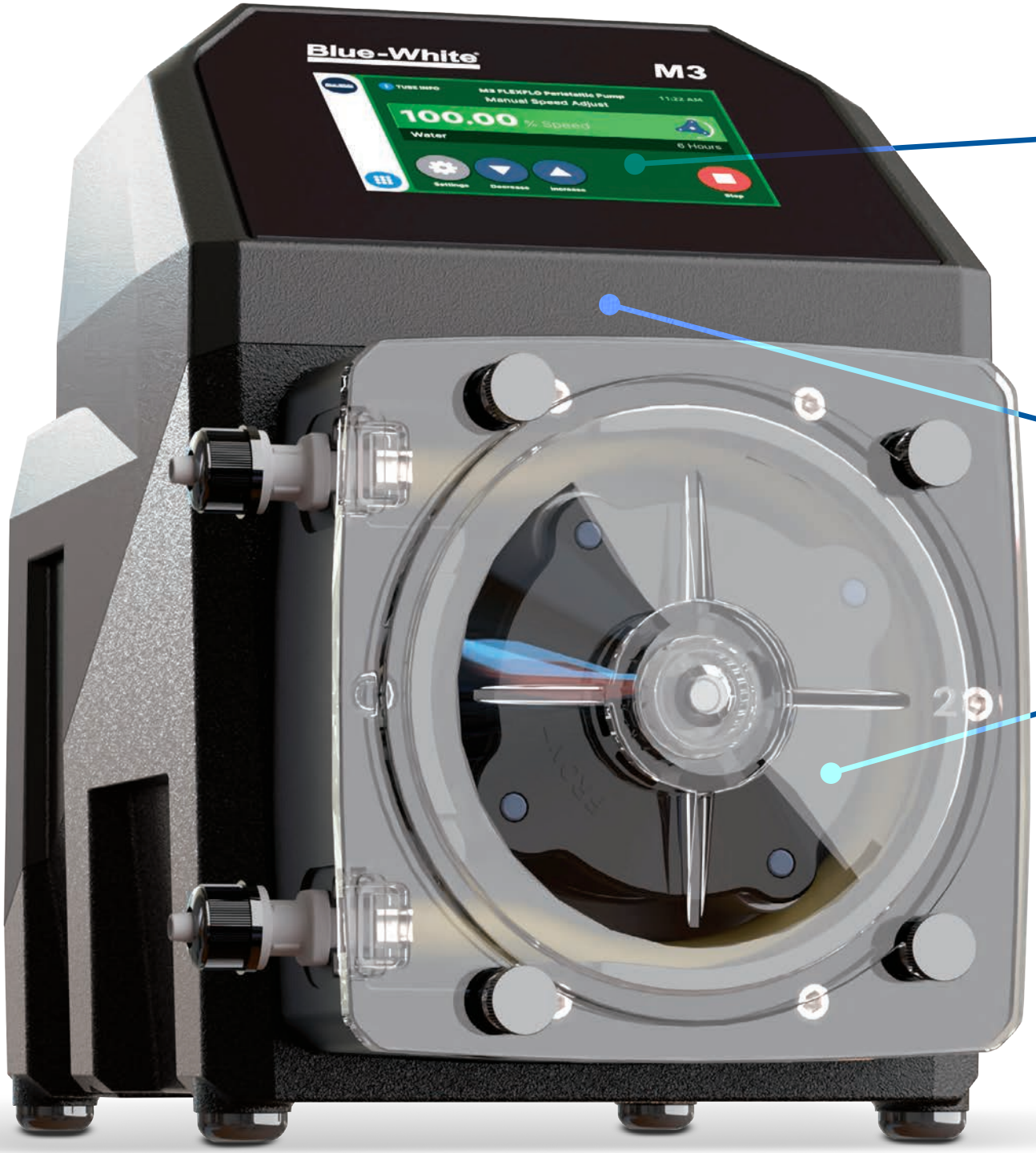

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Where Are Our Priorities?

LEAD IN DRINKING WATER REARED ITS HEAD AGAIN LAST FALL IN MICHIGAN. WHY ARE WE SO WORRIED ABOUT PFAS WHILE LEAD CONTINUES THREATENING TO POISON CHILDREN?

By Ted J. Rulseh, Editor

As I write this column, I am recalling another incidence of lead in drinking water, this time in Benton Harbor, Michigan which, like Flint, is a poor community with a largely Black population.

Last September Michigan's governor Gretchen Whitmer pledged to invest $200 million to replace all the lead water service lines in the state within 18 months — and bravo to her for that. It's an ambitious goal, but the problem deserves the priority being given to it.

The question I have is this: Why do we read so much in the media about controlling PFAS when lead in drinking water from older homes' service lines remains a serious problem? I don't mean to laugh off PFAS, sometimes called "forever chemicals," which are tied to a variety of potential health effects, including increased risk of various cancers.

THE HAZARDS OF LEAD

But so far the effects of PFAS are of the "may lead to" variety — there is not enough hard evidence yet to say definitively how these substances affect human health in the amounts found in people's bloodstreams to date. More study is warranted.

Meanwhile, we know that lead can be present in harmful concentrations in the drinking water of families whose homes are connected to water utility piping by lines that contain lead. And we know that lead is extremely toxic, especially to young children — that is why it was removed long ago from gasoline, paints and other products.

There is no "safe" level of lead; the U.S. EPA has set the maximum contaminant level goal at zero for lead in drinking water. That's because lead is toxic even at very low levels, is persistent, and can accumulate in our bodies over time.

The EPA reports that young children and infants are especially vulnerable because lead affects them at lower levels than in adults. In children, lead has been linked to damage to the central and peripheral nervous systems, learning disabilities, shorter stature, impaired hearing and impaired formation and function of blood cells.

Meanwhile, the Green & Healthy Homes Initiative reports that children poisoned by lead are seven times more likely than normal children to drop out of school, and six times more likely to become involved in the juvenile justice system. These effects are not of the "may lead to" variety. They are well known and well documented.

WHICH BEGS THE QUESTION…

Because all this is true, why isn't our country, collectively, putting the

pedal to the metal to get rid of lead-containing water services? Why are instances like Flint and Benton Harbor still cropping up?

In Benton Harbor, a city of 9,600 in Southwest Michigan, state officials told residents last October to use bottled water for drinking, cooking and brushing teeth because of elevated lead levels in tap water. Thousands of cases of bottled water were being diverted to the city.

Lead in drinking water has been an issue in the city for several years; the water is drawn from Lake Michigan. The EPA lead contamination action level for lead is 15 parts per billion; if more than 10% of water samples in a community exceed that level, water systems must optimize corrosion control, educate the public about the effects of lead and replace lead service lines.

Benton Harbor came under that provision in 2018. In 2020 water in one home tested at 440 parts per billion. In 2020, water from 11 homes showed lead levels above 15 parts per billion; one home's water registered 889 parts per billion.

TIME FOR MORE ACTION

It's not as if nothing has been done toward abatement of lead in drinking water. Many states and communities are taking action, and the newly adopted federal infrastructure law contains significant funding to support those efforts.

Of recent note, last December the Biden administration announced a plan to eliminate lead pipes (and lead paint in old homes) within the next decade.

It would seem that whether or not a community's lead problem rises to the point where the EPA requires action, lead in drinking water is a scourge.

We know that lead is extremely toxic, especially to young children — that is why it was removed long ago from gasoline, paints and other products.

At the same time we worry about PFAS in biosolids applied to cropland, where the possibility of human exposure is remote. And PFAS is all over the news — maybe because the issue is relatively new, and maybe because one of the potential effects of PFAS is greater risk of cancer, always a red flag.

Meanwhile, the lead problem persists. Knowing what we do about lead, and contemplating the horror of children being harmed by the water they drink in their own homes, shouldn't we make sure the elimination of lead services gets to or remains at the front of the line for action?

Solving the problem is not as easy as it seems; the logistics and cost of replacing lead lines and taking other measures to limit lead exposure are challenging for many communities, especially smaller ones. On the other hand, perhaps in the richest country in the world we should have a zero-tolerance policy toward lead in the water our children drink.

Is replacing lead lines to multiple homes expensive? Of course. But does it seem as if it's got to be done? Again, of course. So what in the world are we waiting for? tpo

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HAB STUDY

Toxins in National Parks

In an effort to address management needs related to harmful algal blooms, professional and trained citizen scientists are using innovative techniques to sample and monitor HABs in freshwater and marine environments across 18 U.S. national parks. The new suite of simple, low-cost sampling methods can analyze up to 32 freshwater and 25 marine algal toxins.

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ALGAL BLOOMS

An Ancient Issue?

Algal blooms negatively impacting daily life isn't a new phenomenon, according to a study by Auburn University paleolimnologist Matthew Waters. He and his team traveled to Lake Amatitlán in Guatemala — home of the ancient Maya of Mesoamerica — and measured biomarkers for nutrients, algae, cyanobacteria and cyanotoxins in a sediment core representing approximately 2,100 years.

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CONTAMINANT MOVEMENT

Studying River Environments

A Washington State University-led research team is working to improve our understanding of how contaminants, nutrients and naturally occurring minerals interact with the environment as they move downstream in a river. The plan is to develop a database of river experiments around the world as they work to improve the modeling of the transport processes.

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This Talent Rose to the Top

A BACK INJURY ENDED RUSTY TOURNADE'S CAREER AS A BRICKLAYER. TODAY HE'S AN AWARD-WINNING WATER PLANT OPERATOR AND FOREMAN.

STORY: **David Steinkraus** | PHOTOGRAPHY: **Denny Medley**

Rusty Tournade came to the water industry only nine years ago.

He started with the City of Eudora, in Northeast Kansas, in 2012 as a seasonal worker on the mowing crew. Then he went full time, reading water meters for two weeks a month and otherwise working on the streets or running the vacuum truck cleaning sewer lines.

"I was interested in the water plant," he recalls. "They had only three operators at the time."

He asked for training, and the city manager agreed. "So they cross-trained me over here. It wasn't two or three months later when water plant foreman left, so they asked me if I wanted to come over here." About six months later, he was promoted to foreman.

For his excellent performance, Tournade received a 2020 Operator Meritorious Service Award from the Kansas Section AWWA.

Rusty Tournade
Eudora, Kansas

POSITION:
Operator foreman

EXPERIENCE:
9 years

DUTIES:
Hiring, training, maintenance, reporting, ordering supplies and equipment

EDUCATION:
High school; one year of bricklaying at Liberal Area Vocational Technical College

CERTIFICATION:
Class IV water operator

GOALS:
Rehabilitate existing filters, prepare for possible new plant in 5-7 years

Rusty Tournade, Eudora Water Treatment Plant operator foreman, with his 2020 Operator Meritorious Service Award from the AWWA Kansas Section.

Eudora is growing, and a new water treatment plant is coming in a few years.

> "If I have to buy a bunch of tools to do a job, I won't. But anything that I can tear down and get back together in a day or two, we usually do in house."
>
> **RUSTY TOURNADE**

UNCONVENTIONAL PATH

Tournade arrived in Eudora in (population 6,400) with a varied background. He grew up in Plains, a small town in the southwest corner of Kansas near the Oklahoma border, and graduated from high school in 1977. He started work life in bricklaying because it was an interest of his best friend: "We drove back and forth to Liberal and took vo-tech for a year," he says.

But while working in concrete construction he injured his back. "Bricklaying is a lot of bending over and lifting, so I decided that probably wasn't a career job for me," he says.

He found work with a company that oversaw irrigation rigs, and that introduced him to pumps and water. Then for about a dozen years he worked as maintenance supervisor for a swine-breeding company; that introduced him to wastewater.

He moved to Northeast Kansas because it gave his wife Marla more job opportunity. She worked as a nurse at a hospital near Plains but saw no path for advancement there beyond direct patient care; she is now director of nursing for a retirement community.

Tournade found a job with Amarr Garage Doors in nearby Lawrence. There he had to work nights, and every other weekend there was mandatory overtime. He moved on to be buildings and grounds lead at Lawrence High School, overseeing custodial and maintenance workers.

"I loved the job, loved working with the kids, but I couldn't handle the leadership at that time," he says. He feels better suited to that role now.

SOFTENING WATER

Eudora uses groundwater and operates a lime softening plant. Groundwater entering the plant and runs through aerators and then into a rapid mixer that feeds lime, polymer and anti-corrosion chemicals.

After the rapid mix, the flow is divided between the two upflow clarifiers. Next are a set of sand, gravel and anthracite gravity filters, followed by the clearwell and the distribution system. "Coming out of the wells, we're running between 400 and 500 grains of hardness," Tournade says. "Yesterday, leaving the plant we had an average of 108."

There are six wells, one on the plant site and the others are about a mile northwest of Eudora.

Some maintenance is subcontracted out. "If I have to buy a bunch of tools to do a job, I won't," Tournade says. "But anything that I can tear down and get back together in a day or two, we usually do in house."

STEADY GROWTH

A new water plant is coming in a few years. Although the present plant is not at capacity, it will get there, Tournade says. Eudora has been growing because people are moving in from Lawrence to the west and the Kansas City metro area to the east. From April 2010 to April 2020, the population increased 4.3%.

Tournade, shown working one of the newly installed valves (Henry Pratt) in the pipe gallery, has helped improve plant reliability and reduce after-hours service calls.

The team at the Eudora Water Treatment Plant includes, from left, Travis Ramos, Class IV operator; Rusty Tournade, operator foreman; Greg Perkins, Class I operator; and Lawrence Steele, Class IV operator.

Population growth is the only big issue. The choice, he says, is between expanding the current plant and building a new one, but there is no space on the existing site, a triangle of land bounded by a road, a railroad track and the Wakarusa River. City public works buildings also occupy the site, too, along with trucks, trailers and other equipment. So Tournade believes the best option is to build a new plant elsewhere.

Before the pandemic year when everyone was at home and using water all day, it was easy to predict what the large-volume days would be. Previously, Sunday was high demand day, but Monday wasn't. The pandemic flipped that.

HELPING OUT

As of late last year, the street department had only two people, so Tournade's department (with four) shared emergency calls. The streets department has the city's sewer-cleaning vacuum truck. Sometimes there are no off-hours calls. Most are simple, like backed-up sewers. Winter calls come from people who don't have water or have frozen pipes and need supply lines shut off.

Working in the plant with Tournade are Travis Ramos, Class IV operator; Lawrence Steele, Class II; Greg Perkins, Class I. Tournade is a Class IV.

State law requires a Class III license to run the plant. "We don't require all our operators to be Class III or above," Tournade says. "They are required to have a Class I license within 18 months of being hired. We encourage them to get more education, but it's not mandatory."

Although Tournade is not a fan of working night shifts, the 24/7 nature of the Eudora job doesn't bother him: "When I started here, I was getting a lot of alarm calls. Through the years I was able to figure out better ways to fix things, and now I don't get alarm calls very often."

Rusty Tournade, with operator Greg Perkins, encourages team members to further their education and attain higher levels of licensing.

TRAINING FOR LEADERSHIP

Even before the pandemic it was hard to find talented workers. That is why the University of Kansas began its Emerging Leaders Academy. It's focused on public sector employees; agencies that send employees gain a pool of people to draw on as current leaders retire.

"I was asked by my boss at that time if I would be interested in doing that," says Rusty Tournade, operator foreman at the water plant in Eudora, Kansas. His boss had been in one of the programs. Tournade graduated from the academy in 2018.

Classes ran every other week in Topeka, about a 40-mile drive. The class included several people from law enforcement and from the juvenile detention center there. The class was split into groups and received assignments. One was about budgeting: "Of course, you didn't have enough money to make everything work, and you had to figure out what to do.

"I think the biggest thing I learned was how to deal with different personalities. It probably helped my management skill." It's knowledge he still uses every week.

EYE ON MAINTENANCE

One continuing problem was the lime feeder, which wasn't running properly. "A couple of years ago I got really frustrated, and so I just shut the plant down and tore it all apart and figured out what I thought might be the problem," Tournade says. The paddles, which are supposed to just barely touch the inside of the chute, had worn bushings. He replaced the bushings and paddles, and that was the solution.

One criterion for the AWWA award is for modifying or using equipment to improve treatment. Another part is for maintenance. Usually twice a year, Tournade pigs the lines that bring water from the wells. He comes in early, runs the plant for about an hour until other people arrive, and then shuts the plant down and starts running pigs. "I like to run about seven pigs through a line to get it all cleaned out," he says.

It's a necessity given the high iron content of the groundwater. When a new well was added a few years ago, technicians making the connection opened the 10-inch main leading to the plant. "They cut a section of that 10-inch line out, and it was probably closer to a 7-inch center than a 10-inch," Tournade recalls. "It had that much buildup on it."

Pigging lines saves money: If lines aren't kept clean, more well pumps have to operate to get the same volume of raw water.

Another in-house task is draining and cleaning the upflow clarifiers twice a year. When clarifiers are in use, water is about 15 feet deep, and it's impossible to see the scraper on the bottom of the basin. Two people can drain, thoroughly clean, inspect and repair parts in one clarifier in three to four days.

A contractor handles well pump and motor maintenance. Occasionally Tournade has to call for service. Once rust prevented a check valve above a pump from closing. "Usually, you kick your wells on, and within 5 or 10 seconds the plant is up and running," he says.

"We would turn those wells on and the wells would turn green on the SCADA, which means they're running, but the rest of the equipment wouldn't kick on right away." He worked out which well caused the problem; the contractor removed the pump and installed a new valve.

> "I don't like sitting and doing one thing all day. Between the water towers and the wells and things at the plant, you're on the move a lot."
> **RUSTY TOURNADE**

Operators in Kansas may be familiar with the Eudora plant because it hosts regular training workshops for the AWWA. Tournade is on the section's operator training committee; promoting training is another criterion for the operator award.

There are two workshops are for continuing education, one for beginners (Class I and II operators) and the other for advanced operators. They are mainly classroom sessions, although there is some hands-on instruction. A constant in all the workshops is math: "On your state test, you have math problems to figure out," Tournade says.

FAMILY TIME

Tournade spends his time off with family. He likes doing yardwork at the house he and his wife built about 20 years ago, about 10 minutes from the plant. At present he is putting in flower beds.

"I used to love to go hunting, but I really haven't really gone hunting for over 20 years," he says. "I've got four or five shotguns still sitting in the gun case."

His favorite part of his job is its diversity: "I don't like sitting and doing one thing all day. Between the water towers and the wells and things at the plant, you're on the move a lot. I like this job. That's why I stay here." tpo

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Toward Net Zero

EXPLORING HOW WATER AND WASTEWATER UTILITIES CAN ASSUME LEADERSHIP IN CUTTING GREENHOUSE GAS EMISSIONS AND COMBATING CLIMATE CHANGE

By Ted J. Rulseh

In taking measures against climate change, many cities and water and wastewater utilities are far ahead of the federal government.

Almost routinely, we read about these entities adopting sustainability plans and setting specific targets for renewable energy, emission reduction, energy conservation and more. One common target is net zero energy; some of the most progressive organizations are on their way to that goal, and a few have met it already.

Now Xylem has released a white paper that describes specific ways in which the water sector can take immediate action toward cutting emissions in half. In fact, Austin Alexander, vice president of sustainability and social impact, argues that water-related utilities can lead the way in greenhouse gas reduction and climate protection.

The white paper, *Water Utilities: Moving Fast Toward a Zero-Carbon Future*, (www.xylem.com/en-us/campaigns/race-to-zero/) notes that water utilities account for about 2% of the world's greenhouse gas emissions, about the same amount as the global shipping industry, and have a carbon footprint equal to 101 coal-fired power plants.

The paper makes a case that water could be one of the fastest sectors to decarbonize — without waiting years for the advent of new technologies like carbon capture. Alexander talked about the water sector's role in climate-change mitigation in an interview with *Treatment Plant Operator*.

tpo: Why do you see the water sector as a potential leader against climate change?

Alexander: In the water sector we consider ourselves a sustainability sector. We protect the environment; we provide clean water. Utilities customers do that day in and day out. So why shouldn't water lead the way in greenhouse gas reduction and protecting our climate against warming?

tpo: How would you assess the progress utilities are making so far?

Alexander: Utility operators naturally tend toward what is the most efficient and most cost-effective for ratepayers. Already we see that operators and utility leaders are conscious of how much they're spending on energy and how they can make improvements. And I have been pleasantly surprised, coming out of WEFTEC and other conferences, to see that utilities, from larger and more progressive ones to rural communities, are starting to ask: Can we take the next step and make a net-zero commitment? We have a lot of wood to chop to make significant reductions, but the willingness is certainly there.

tpo: How can private sector companies help drive progress?

Alexander: It starts with giving utilities high-quality data about our products and the impacts they have when operating. Data enables customers to make smarter and more holistic decisions.

tpo: How can utilities make major progress today toward net zero?

Alexander: The first step is to make a commitment. What you commit to and measure is what will get done. Make a commitment and put that in front of your organization and the communities you serve. That's step one, and it's a big step.

Austin Alexander

tpo: Once that commitment is made, what comes next?

Alexander: Step two is to make a portfolio assessment of how you are operating today. That is not easy, but it's really important. What is our baseline? This should be part of a utility's commitment and target-setting announcement. Where are the biggest emissions contributors? Turn on the lights to your operations. Put your arms around it and get a high-quality data set of what exists today for greenhouse gas emissions.

tpo: What about taking action toward meeting the commitment?

Alexander: There is a lot of technology available today to make significant reductions, particularly in electricity and energy use. There are improvements that can deliver substantial and immediate progress in both cost savings and greenhouse gas reductions.

tpo: What are some specific examples of these technologies?

Alexander: On the water utility side there is advanced metering infrastructure (AMI). If you are doing drive-by water meter reading, that's a lot of time and a lot of energy and fuel consumed. AMI gives real-time metering data without having to drive house to house. In addition, a great deal of progress has been made in motor efficiency and controls. There are things like permanent magnet motors and control overlays that can be applied quite well to existing operations with very significant reductions in energy use.

> "In the water sector we consider ourselves a sustainability sector. So why shouldn't water lead the way in greenhouse gas reduction and protecting our climate against warming?"
> **AUSTIN ALEXANDER**

tpo: Your paper says 50% of emissions can be abated with existing technologies and 95% of that impact can be achieved at zero or negative cost? Can you explain?

Alexander: One of a utility's biggest expenditures is electricity. If they have to replace equipment anyway, or if they have new installations coming up, then installing a much more efficient product will bring power savings

that more than offset any additional investment. By operating more efficiently, they will save significantly on their power bill, especially with equipment that runs 24 hours a day. There is a major impact in reducing the energy required for that equipment by 20-30%.

tpo: Does water reuse figure into this picture?

Alexander: Water reuse — particularly direct potable reuse — can be a great option, because it takes a lot of energy to send treated wastewater out to the environment and bring water back into a water treatment plant. If a utility can move to reuse, that can have environmental impacts on the water side, but also on greenhouse gas emissions and energy.

tpo: Do any of these choices extend out into the field network?

Alexander: In wastewater collection systems, utilities struggle with combined sewer overflows that have regulatory and environmental consequences. They can help prevent those events and use energy in their pumping more efficiently by overlaying an optimized digital solution. Meanwhile, at the treatment plant, there are control overlays that can help operators account for different flows during the day and adjust treatment accordingly.

tpo: What role do you see for renewable energy?

Alexander: That is a big piece of the puzzle, and the water sector needs to raise its hand and saying: We have this fabulous asset in biogas in wastewater treatment plants that in many communities is not being utilized; let's hook up to that to help us on the journey.

tpo: What about making land and rooftops available for wind and solar energy?

Alexander: There are all kinds of options. Many utilities have large land footprints and are making use of that, particularly with solar. They're able to power their plant and make a little profit if they can sell the surplus back to the power utility.

tpo: In the longer term, what technologies do you envision having an impact?

Alexander: We anticipate a number of technologies coming into play that don't exist today, especially around carbon capture. Inevitably, getting to net zero will require some kind of offsets and carbon capture, but we need to let that market develop, so that we can approach it in a highly credible way. Another area is process emissions; in particular emissions coming off the anaerobic or aerobic digestion processes which make up a large share of utilities' emission sets. That is an area where new and advanced technologies will help.

tpo: How optimistic are you that the move toward net zero will get traction?

Alexander: I'm very optimistic based on the excitement we're seeing from utilities around the U.S. and globally. I think they see the value; they're excited about it. Let's make the investments and make the most of our water and wastewater infrastructure, and do it in a sustainable way. Especially in the U.S., we are starting to consider infrastructure investments that can have meaningful impacts on high-quality utility services while reducing greenhouse gas emissions. If a municipality wants to make a big step, the first place to go should be their water and wastewater utilities. They touch every single home in the community.

There will never be a one-size-fits-all solution. But we have so many options that can be beneficial both on the cost and the environmental sides. Utilities are starting to explore how they can pull together different options to make a truly sustainable treatment operation.

tpo: What is Xylem doing to mitigate its own carbon footprint and climate impact?

Alexander: On Sept. 30 we announced a commitment to be net zero across our entire value chain by 2050. That includes our supply chain as well as our own operations, and the footprint our products have when operating at a customer level. Our upstream supply chain and the downstream impact of our products account for over 90% of our greenhouse emissions, so that's where we are focusing much of our effort.

Our own facilities are making adjustments today. We've committed to a 100% electric vehicle fleet. Our largest 22 sites that contribute the most to our environmental footprint are on their way to 100% renewable energy. We've also set an interim target to reduce our emissions in line with holding global warming to 1.5 degrees Celsius. We need near-term targets that hold current management teams accountable for making reductions today. **tpo**

We Are Family

WELCH'S WATER AND WASTEWATER SERVICES RUNS ON STRONG FAMILY TIES — AND TREATS THE CLEAN-WATER FACILITIES IT OPERATES LIKE BELOVED CHILDREN

STORY: **Suzan Chin-Taylor** | PHOTOGRAPHY: **Adam Perri**

Kathy Welch, vice president, Welch's Water and Wastewater Services

In 2020 when the North Woodstock Wastewater Treatment Plant won a U.S. EPA Regional Excellence Award, it was a career cap of sorts for Terence "Terry" Welch.

Welch is president of Welch's Water and Wastewater Services, a family business established in 1991 that operates the plant in rural New Hampshire, just south of the Canadian border. The company operates multiple facilities in Northern New Hampshire.

The business has received several state, regional and national awards for operational excellence. Welch is the former licensed operator for the company. Sidelined some years ago by injuries, he now works part-time in support of his wife Kathleen "Kathy," vice president, who is chief operator at the Woodstock facility and handles duties related to permits, compliance and laboratory techniques.

Their son Joshua Welch is treasurer and lead operator of a drinking water facility in Bethlehem, New Hampshire. He also serves, as his father did, as leader of the dive team, which performs underwater inspections and repairs in the plants the company manages. Daughter Hillary Welch is an administrative assistant and holds a Grade I wastewater operator license.

LEARNING THE ROPES

Before founding the company, Terry Welch worked with Boston-based Metcalf & Eddy, a holding company for nearly 2,000 environmental services and engineering firms. He also was an operator at the Resort Waste Services Wastewater Treatment Facility in Bretton Woods when it was built in 1988 in New Hampshire's scenic White Mountains.

At first the Woodstock plant, serving North Woodstock, was operated in-house by Dale Witham and Bill Mellett, superintendent of water and wastewater. Terry and Kathy Welch learned about the importance of a work ethic from them.

"Those guys ran the system since day one, for 30 years, before they called us in 2002," he recalls. "They were on call 24/7. And in the old days there were no pagers; you had to stand by a telephone. I said to them when we had our interview, 'You haven't had a vacation?'

"And they said, 'We live in Vacationland. We're on vacation all the time.'

Terry Welch, shown recording sludge depth using a Raven Sludge Interface Detector, is president of Welch's Water.

Welch's Water and Wastewater Services

Whitefield, New Hampshire

OWNERS:
Terence and Kathleen Welch

FOUNDED:
1991

SERVICE AREA:
Northern New Hampshire

SPECIALTY:
Contract operation of small rural wastewater treatment plants

"You should see how hard these guys worked — almost 11,000 days straight without a day off, without a sick day. Every day they showed up with a sense of humor and a smile. We just loved when we had the chance to work for them. They called us to help them because we had some new rules and regulations for doing Department of Environmental Services (DES) and U.S. EPA reporting."

INTO THE FUTURE

The Welch's team carried on that work ethic when the municipal operators retired, and it continues today. Welch observes. "Those guys wove it into us. It's so nice to really have pride in your facility, from A to Z. Be happy with each job you do, whether you're painting, scraping, adjusting or fixing pumps, or doing lab work. With this attitude, Kathy has been operating the Woodstock Facility with 95% of the original 51-year-old equipment.

"We still talk to Bill. He's like an older brother to us. Any time we have a question, I can give him a call and he'll stop down and say, 'Gee whiz, I don't remember. But I think we did it like this.' And he remembers."

In taking on the Woodstock facility, the Welch's team took a proactive approach to keeping it running reliably. "We maintain the equipment," Welch says. "It's like a well-run ship. In the Navy, everything was clean. Everything was painted. When something needed to be fixed, it didn't get put off. It got fixed right away."

ALL ABOUT ATTITUDE

The approach has paid off. The Woodstock facility was one of only three in New England to receive the EPA award. The 0.34 mgd (design) activated

Terry Welch sees his company's success as a result of his family's collective hustle and "we'll find a way" attitude (chlorine gas injection system from Hydro Instruments).

sludge plant has screening and grit removal, three oxidation ditches, clarification and chlorine disinfection (Hydro Instruments). Effluent discharges to the Pemigewasset River.

About 9,000 gallons per week of biosolids at 1% solids is sent to the Winnipesaukee River Basin Program Wastewater Treatment Plant in Franklin, New Hampshire.

The plant serves about 600 residents; the biggest demand comes from tourists: skiing and snowboarding in the mountains in winter, then hiking, fishing and other activities in warm weather. Shops, restaurants and lodging businesses cater to the crowds, all feeding the gravity collection system, managed by the Department of Public Works.

"We were hired specifically to run the treatment plant," Welch says. "Because of our knowledge of collection systems, we assist them, just like the DPW helps us when we have a problem. Kathy just needs to pick up the phone and so much support will come from the DPW. It saves the community a lot of money, as opposed to having contractors come in and do the same duties."

READING THE MARKET

Welch sees his company's success as a function of his intuition about a market need, his family's collective hustle, knowing the right people and having a "we'll find a way" attitude.

"I saw an opening in water and wastewater where there are a lot of facilities that are part time," he says. "Some of our jobs are a half hour a day, just checking and making sure the chemicals are running right. So we didn't go to the people, people came to us.

"We were well-known from the DES. They can't recommend us, but they did say, 'These guys do it right.' And that's how Woodstock got our telephone number. We were already running 11 systems at the time, and there were only five of us. We had one other operator who wasn't a family member. It was a lot of work, a lot of travel.

"Our niche is 'What do you need?' Do you need a backup operator? A laboratory person? Do you want us to just take charge and run the facility? If they need us for a day, a week, a month, a year, or years, we're there for them. I've had the pleasure of working with many good operators, and it's amazing what they'll do to save the day. It's pretty spectacular. They're like firemen and policemen, but nobody notices." *(continued)*

The Welch's Water team includes, from left, Terry Welch, president; Josh Welch, treasurer and operator; Hillary Welch, administrative assistant and lab technician; and Kathy Welch, vice president and chief operator. Also shown are members of the Town of Woodstock staff: board of selectmen members Gil Rand, Scott Rice and Charyl Reardon; Mike Welch, public works superintendent; and Mike Donahue and Tyler Jones, public works employees.

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Hillary Welch opens a waste activated sludge valve to feed sludge holding bags. Her daughter supervises.

> "The treatment plants are like our kids. We love them. Some of them misbehave and some are mischievous, but all in all they do an excellent job."
>
> **TERRY WELCH**

BRANCHING OUT

One line of business is doing dives to clean, inspect and repair water and wastewater systems. Like his father, Terry Welch was a U.S. Navy diver.

"I started diving at 12, getting lobsters off of Salisbury Beach," he says. "I was so proud to get food on the table." After he left the Navy, he did mostly recreational diving; when he moved to the Northwoods, he believed he'd never dive again. "But I've dived more since I've been up here than I ever did in the Navy or when I was younger."

It all started with drinking water. "I think it was 1989, might have been 1990, a big resort area, had a bad total coliform hit. They did repeats and got it again. I was working at the wastewater plant and knew the water system operators. I collected samples all over the place to isolate this total coliform problem."

It turned out to be in the reservoir; about 300 dead mice lay on the bottom. "So we hooked up a pump. I dived into the reservoir and vacuumed out all the mice and sediments. Within 48 hours, we had clean plates. That got around through the area, and I decided to buy some commercial diving equipment to keep doing it."

DIVING RIGHT IN

He found he could get a lot of business diving into lagoons to repair aeration tubing, instead of pumping the lagoon down. He thought, "I can fix all this stuff without pumping one gallon of water if I have the right equipment. I got my first diving job in Bethlehem.

"Another company's quote to redo the aeration system was $150,000-$170,000, and we did it for $20,000. We got real popular. I dived in maybe 50 lagoons in New Hampshire, Maine and Vermont. If it wasn't for Kathy's knowledge and can-do attitude, our dive team wouldn't have materialized. She knew all the operational techniques, emergency protocols and duties. When I was on dive jobs, Kathy handled many obstacles on her own."

Joshua Welch is the licensed lead diver, but the jobs are so dangerous that Terry hires two other divers, at a cost of $4,000 per day, to fulfill safety regulations. It's all part of a job he loves: "The treatment plants are like our kids. We love them. Some of them misbehave and some are mischievous; but all in all, they do an excellent job."

He wears his pride on his sleeve. "Love your job," he says. "If you don't love the job, go someplace else. It's really important to love what you do, and we love making clean water. I have goosebumps right now, just thinking about it. Water has been my life. And to be able to keep the rivers clean, that's why we worked so hard." tpo

STEPPING UP

Welch's Water and Wastewater Services runs the Resort Waste Services Wastewater Treatment Facility at Bretton Woods, the Mount Washington Hotel treatment plant, the North Woodstock treatment facility, and the drinking water and wastewater facilities in Bethlehem, New Hampshire.

Brought up in Newburyport, Massachusetts, Terry Welch and his wife Kathy started working together because he didn't know how to type. Kathy typed up all his reports, learning the water and wastewater business along the way. She took over operations of the Woodstock Wastewater Treatment Plant, after Terry sustained multiple severe injuries.

"I ended up breaking my ankle on a dive job, my tibia and fibula," Terry says. "Then I had a total hip replacement, and then I blew out my back. I was in pretty rough shape, and we were going lose a bunch of customers because I just wasn't fit enough to do my job.

"But our daughter Hillary quit her local job and stepped up with her husband Jared Cassady. He joined the team to help out part time. Our son Joshua moved back, taking a $12-per-hour pay cut to keep the family business alive."

As for Kathy, Terry can't say enough: "She's my everything. I get all the credit, but she was the one from day one, behind the lines. She runs Woodstock, which is the most demanding system we operate. She won Operator of the Year a while back for bringing QA/QC in the lab up to date.

"And she did that for pretty much every wastewater system in the north country — brought them into compliance, showing them all the QA/QC standards. She's real good at reading and deciphering rules, then breaking them down.

"Joshua runs the brand-new Bethlehem Village District Water Treatment Plant, and Hillary does all the lab work at the wastewater facility. She's our next in line as the professional related to permits, compliance and making sure all our I's are dotted and T's crossed. She also operates the Mount Washington Hotel facilities."

The company does get help from a part-time operator: "He does real good service for us on the weekends. We were like those old-timers, never had any time off. We went a long time without having a vacation, but once we started, it was nice to have."

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Energy Positive

FOOD WASTE IN A MASSACHUSETTS SANITARY DISTRICT FACILITY ENABLES A WASTEWATER TREATMENT PLANT TO PRODUCE MORE POWER THAN IT USES

By Steve Lund

When the state of Massachusetts prohibited the landfilling of organic material, the Greater Lawrence Sanitary District made plans to use food waste to boost biogas production from its anaerobic digesters.

The plan has worked so well that the wastewater treatment plant is a net producer of electricity. The district, in North Andover, added a fourth digester, installed a combined heat and power system, and built capacity to accept processed food waste for co-digestion. The project won an Energy Management Achievement award in 2020 from the New England Water Environment Association.

Cheri Cousens, executive director of the Greater Lawrence Sanitary District

The project cost about $30 million, but about a third of it was paid through grants and incentives from the state Department of Energy Resources and Department of Environmental Protection, the Massachusetts Clean Energy Center, gas and electricity provider National Grid, and the Clean Water Trust.

The district had been using three anaerobic digesters to produce biogas to heat the digesters and the rotary drum dryer (Baker-Rullman) that turns biosolids into a Class A farm fertilizer. "In 2019 we added a fourth digester," says Cheri Cousens, P.E., executive director. "We mix biosolids with the food waste and send a completely mixed feedstock to each digester."

Food waste slurry is delivered to the wastewater treatment plant in tanker trucks.

The combined heat and power system is driven by two Caterpillar 3520C engine-generators.

The final drying stage for Class A biosolids production is this rotary drum dryer (Baker-Rullman).

HIGH-POWER FUEL

The food waste is collected and processed at a Waste Management CORe facility in nearby Charlestown and delivered to the district as a slurry in a tanker truck. The mix of food waste and biosolids produces much more biogas than the biosolids alone. Cousens says it's like the difference between regular gas and high-octane premium fuel.

"If you put in a higher-octane fuel, you get more power out of the same machine," she says. "That's what's happening with these digesters. If you put in a different feedstock that has more volatile solids in it, you can get more biogas. We have more than tripled our gas production."

The biogas goes through a cleaning process to remove hydrogen sulfide, siloxanes and moisture and then is used in two Caterpillar 3520C generators to produce electricity, plus heat for the digesters and other purposes.

"We produce more power than we need at this time," Cousens says. "We are putting power back on the grid. We are able to net-meter that power, and it has administratively paid for the energy used at our offsite pumping station."

The district, known as GLSD, already had some solar power at the treatment plant and has tried to be efficient with the use of electric power, but

> “The biosolids are converted to a fertilizer product, and then we make heat and power — and clean water. The environmental benefits are tremendous.”
>
> **CHERI COUSENS**

adding food waste to the digesters enabled the plant to go beyond net zero in terms of electricity use. “This has been years in the making, and to actually say this now, it’s amazing,” says Cousens.

The district has also significantly reduced natural gas usage by harvesting heat from the CHP engine cooling systems and exhaust. The treatment plant, which opened in 1977, has a design capacity of 50 mgd and an average flow of about 30 mgd. The effluent, after chlorine disinfection, is discharged into the Merrimac River.

OTHER MEASURES

The biosolids are dewatered in a centrifuge (WGEA) and then in the rotary drum dryer to make fertilizer pellets. Although the digester volume has increased significantly with the addition of food waste, production of fertilizer pellets has not changed much. “What’s really interesting about adding food waste is that it almost entirely converts to biogas in the anaerobic digestion process,” Cousens says.

In addition to the Organics to Energy Project, the district embarked on major upgrades to its main pumping station, Riverside, about a half-mile from the main treatment plant. The district has significantly reduced the electrical demand there by optimizing pump operation.

Eddy current clutches (Dynamatic) were added to two 800 hp pumps (Grundfos) that work in tandem with two 1,200 hp pumps (also Grundfos) that already had eddy current clutches. The 800 hp pumps were also rebuilt, and the pumps were staged differently so that the smaller pumps work more often than the larger ones. The result was a 21% reduction in electrical demand.

RESILIENT AND SUSTAINABLE

The CHP system shuts down automatically if the electrical grid goes down, but it can be restarted off-grid, if necessary, to keep the plant operating even during an electrical outage.

“We can start the engines in what we call island mode,” says Cousens. “We start the engines using natural gas, and we can power the whole plant without being connected to the grid.

“We have tested it several times. There was one instance where National Grid had planned maintenance on our line, so we knew they were going to be down for about five days. We proactively went into island mode and ran the engines for that period. It was actually a really good test of the system.”

Keeping the system running during an outage means the food waste digestion project has made the plant more resilient as well as more sustainable. “The state organics ban was the impetus for this project,” Cousens says. “Without feedstock we wouldn’t have been able to produce the biogas we are using to make the power. In the end, we take the wastewater and bring in food waste. We remove screenings and grit, and that does get landfilled; we have no other option for that. But the biosolids are converted to a fertilizer product, and then we make heat and power — and clean water. The environmental benefits are tremendous.” **tpo**

The biological nutrient removal project at the Sacramento Regional Wastewater Treatment Plant is the size of 18 football fields and uses bacteria to remove more than 99% of ammonia from wastewater.

Seizing Opportunity

THE GOLDEN STATE'S REGIONAL SAN TURNED A REGULATORY COMPLIANCE CHALLENGE INTO IMPETUS FOR A PIONEERING BIOLOGICAL NUTRIENT REMOVAL PROCESS

By Suzan Chin-Taylor

In 2010 the Sacramento Regional County Sanitation District need to make significant upgrades to its wastewater treatment plant to meet strict new permit limits for discharge to the Sacramento River.

Careful planning, smart funding and a savvy pilot project paid off with a mother lode of positive outcomes, for the California district, including unexpected savings and rate dips.

The district, known locally as Regional San, created the EchoWater Project. It is funded by ratepayers and new development impact fees, along with a low-interest State Revolving Fund loan. The collection of projects is designed to take the Regional San wastewater treatment plant from secondary to advanced treatment.

The heart of the project is biological nutrient removal. Being surrounded by a major agricultural region, the district needs to removal excessive organic matter, nitrates and ammonia from influent streams.

Ammonia removal is most critical, and the BNR process removes more than 99% of it, directly helping the Sacramento River, on which the entire state ultimately depends for drinking water, irrigation and economic stability.

CHANGING TIMES

As the largest discharger to an inland water body west of the Mississippi, Regional San serves 1.6 million customers in a 386-square-mile area. Permitted for 181 mgd, the Sacramento Regional Wastewater Treatment Plant treats 136 mgd on average dry weather and has a wet-weather capacity of 347 mgd.

Of four contributing wastewater agencies, all have standard separated sewers, except Sacramento, whose older combined system contributes to volume with winter stormwater flows, including leaves, inorganic matter and street debris.

Wastewater enters at the headworks which includes bar screens, followed by aerated grit chambers and primary sedimentation. Previously, secondary treatment used a high-purity oxygen activated sludge process before the secondary clarifiers.

Previous BOD and TSS limits were 30 mg/L. But in 2010, the California Regional Water Quality Control Board issued a new permit ratcheting those limits down to 10 mg/L. "That changed everything for us," recalls Mike Crooks, deputy director of operations and program manager for the EchoWater Project. "Now that it's considered Title XXII equivalent, we're also required to provide tertiary treatment.

"The short residence time of our secondary process really didn't touch the ammonia as flows went through, so what came into the plant pretty much went out into the river. The process wasn't designed to address ammonia. It was mostly for the BOD loads we typically saw decades ago when we had customers like Campbell's Soup. We had to handle those high, spiky BOD loads. That was the important thing then."

PROOF IN THE PILOT

In early 2011, Regional San constructed a pilot plant at the treatment facility to test various filtration and disinfection technologies that could cost-effectively address the new treatment requirements.

"When you embark on a project of this size with the regulatory requirements we had, you can't get to the end and say, 'Oh, it doesn't quite work,'" says Christoph Dobson, general manager. "So, you have to be very conservative in your technology selection. We were able to use our pilot program to confirm that in the case of the filtration, granular media would work, and that was a huge savings. Also, we were able to downsize some of the facilities based on optimization."

Crooks adds, "On the disinfection side, we looked at chlorination, ozone and peroxide. We also piloted contact times. We were able to prove that we could meet the enhanced disinfection requirements through a shorter contact time using chlorine. That was the lower-cost alternative.

"Plus, the shorter contact time allowed us to shrink the footprint of that component. So, with respect to the tertiary treatments, I estimate we saved probably $100 million from those two elements, the footprint size of the filters and the basin itself."

IMPRESSIVE STATS

In total, eight basins operate with a 26-foot side water depth, each with a volume of almost 15 million gallons. Each basin has several zones:

- Covered anaerobic or anoxic zone (11% of total area)
- Uncovered anoxic zone (19%)
- Fine-bubble aerobic zone (36%)
- Course-bubble zone (12%)
- De-ox zone (3%)
- Seven swing zones (15%) where operators can run in a mixed or aerated mode, depending on treatment goals
- Re-aeration zone (3.5%)

TEAM EFFORT

Shortly after completing the pilot, the district hired the Brown and Caldwell and HDR consulting firms to provide program management. "They did a lot of the upfront preliminary engineering," recalls Crooks. "They developed a basis of design, selected the process and then established a procurement process to get designers on board."

That was Black & Veatch, who designed the BNR process. Dragados USA built the BNR portion of the facility, while Balfour Beatty Infrastructure constructed the tertiary treatment system. Other consultants including Jacobs Engineering Group, Psomas and West Yost Associates provided supplemental construction management and inspection services.

The tertiary treatment process is new as well. "The effluent from the secondary sedimentation tanks used to just go to chlorination, then to our effluent pumps, then out to the river," Crooks says. "Now, after the secondary tanks will go to the filter influent pumping station, which will then lift it to the filters."

The treated water will be chlorinated, then go through a new disinfection contact basin, a 20-million-gallon tank with four basins in parallel, each with a serpentine flow pattern to achieve our contact time requirement. After the BNR, the flow goes to the secondary sedimentation tanks. Those have not changed, although we did have to change out the pumps because our return activated sludge rates changed with the BNR facility.

A portion of secondary effluent is sent to a smaller, side filtration process on site. It was constructed in the early 2000s and provides tertiary-treated water for a number of uses: some plant processes and on-site irrigation. Some of the recycled water is also sent into a neighboring community for irrigating green belts and parks.

That facility produces somewhere around 3.5 mgd. Once the new filtration goes online, the recycled water will come out of the new filtration process being constructed.

The Sacramento plant operated by Regional San is the largest discharger to an inland water body west of the Mississippi River. It treats 130 mgd on average and has capacity to treat up to 330 mgd.

Regional San is in the predesign stages of a new program to provide roughly 45 mgd of recycled water to agricultural properties south of the wastewater treatment plant. This program, known as Harvest Water, is to be completed in 2024-25.

EXCEEDING EXPECTATIONS

The care and planning put into the plant upgrades has paid off beyond expectations. "Whereas before we had almost no ammonia removal, we're now achieving around 99% removal," Crooks reports. "We're removing roughly 30,000 pounds of ammonia per day, which is huge. The turbidity coming out of our secondaries is amazingly clear. I think we're running roughly 2 NTU coming off our clarifiers.

"At times, we're seeing 1 NTU, which is really good news for our filters, because it equates to a longer runtime before backwash. The other measure of success, in general, is the delivery of this thing in a cost-effective way. We were expecting that much higher rates ($60-$65 monthly) would be required." The actual rate is around $37.

The operations staff will increase to about 25, which is close to a 50% increase. The plant also has higher power costs. The BNR system receives flow from a new primary effluent pump station with four 400 hp pumps, and its aeration system consists of six blowers at 3,000 hp each. These new costs should be offset by a clustered solar energy array.

The solar array provides power to the wastewater treatment plant fairly cheaply through a power purchase agreement. Regional San is also preparing to construct a cogeneration facility that will burn digester gas.

BRIGHT HORIZONS

Dobson is excited about the upgraded plant's energy efficiency: "Environmental stewardship is a really big part of our business and one of our core values. We anticipated a pretty large increase in power consumption, but we've found that some of the systems we removed were very energy inefficient, and those systems were replaced by very efficient new ones.

"Added to savings from recent drops in consumption through consumer conservation, we're not seeing the increase in power demand we thought we would. Though we still have tertiary treatment facilities to come online, it looks like there will be no net increase in power consumption."

He ends with a look to the near future, with more good news: "We brought a sustainability program to our board. A team made up of various focus areas will work on different elements of our sustainability program."

It all demonstrates the strides forward that can happen when operators look for opportunity in situations others might view as problems. **tpo**

Teamwork Does It

NUMEROUS AWARDS ATTEST TO YEARS OF EXCELLENCE IN OPERATING AND MAINTAINING THE LEHIGH COUNTY AUTHORITY'S CLEAN-WATER PLANT

STORY: **Jim Force** | PHOTOGRAPHY: **Kevin Blackburn**

Joe Thompson, left, instrumentation technician, and Jason Stefano, maintenance mechanic, perform maintenance on the newly upgraded sodium hypochlorite disinfection system at the Kline's Island Wastewater Treatment Plant.

Gary Saunders, left, plant manager, and Kevin Marx, operator, discuss upcoming maintenance on the rock media trickling filters and the adjoining treatment tanks.

Perhaps no wastewater treatment facility blends old and new as well as the Kline's Island Wastewater Treatment Plant operated by the Lehigh County Authority in Allentown, Pennsylvania.

On one hand, the staff at the 40 mgd (design) plant operates a fixed-nozzle rock media trickling filter that dates to 1931. On the other, Kline's Island switched to sodium hypochlorite instead of gaseous chlorine for effluent disinfection and replaced old motor control centers and breakers with new equipment.

Future projects will upgrade process control and address wet-weather flows that affect plant capacity. They're balancing old and new so well that the plant recently received the Operation and Maintenance Excellence Award for plants over 2.0 mgd from the Eastern Pennsylvania Water Pollution Control Operators Association.

It's all the result of commitment and cooperation among the 50-person staff. "Teamwork is the key," says Gary Saunders, plant manager. "We work well together, striving for a common goal and pursuing any new idea, as long as it makes our facility more efficient and safe."

The plant also received the operator association's 2020 Laboratory Excellence and Performance Award. Saunders received the 2020 Daniel H. Treat Award for sharing of wastewater knowledge with others, and the 2021 Mark B. Hannum Operator of the Year award from the Pennsylvania Water Environment Association.

> "We work well together, striving for a common goal and pursuing any new idea, as long as it makes our facility more efficient and safe."
> **GARY SAUNDERS**

Kline's Island Wastewater Treatment Plant

Allentown, Pennsylvania
www.lehighcountyauthority.org

BUILT:
1928, improvements in 1968, 1978, and 1999

FLOWS:
40 mgd design, 32 mgd average

SERVICE AREA:
Allentown and 14 surrounding communities

POPULATION SERVED:
155,000

TREATMENT PROCESS:
2-stage trickling filters

TREATMENT LEVEL:
Secondary

RECEIVING WATER:
Lehigh River

BIOSOLIDS:
Land-applied; biogas for energy recovery

ANNUAL BUDGET:
$8.1 million (operations)

WHERE STREAMS MEET

The Kline's Island plant sits on a 33-acre site at the confluence of the Lehigh River, Little Lehigh Creek and Jordan Creek, near the center of Allentown. It serves that city and 14 surrounding communities.

Wastewater enters through 60-inch and 36-inch pipes and passes through two climber screens (SUEZ Water Technologies & Solutions) before Worthington pumps deliver it to the grit chamber. Then it settles in four circular primary basins, each about 1 million-gallon capacity.

Liquid oxygen is added just ahead of the grit chamber to help mitigate against odors and BOD.

From the primaries, the wastewater is pumped by five Johnston vertical turbine pumps to four 100-foot diameter, 32-foot-deep plastic media trickling filters (Dorr-Oliver Eimco). After passing through the filters, the flow is pumped to three circular intermediate clarifiers, each with a capacity of 1.54 million gallons.

The rock media tricking filter follows; nitrification-denitrification occurs as the flow passes through. It's big — 5.32 acres with a depth of 10 feet. After the filter, the water flows by gravity to a series of 10 final clarifiers of varying sizes and then to the chlorine contact chamber. The Lehigh River is the receiving stream.

BIOSOLIDS

The plant maintains three anaerobic digesters. Two receive thickened primary sludge. After digestion, biosolids are transferred to the secondary digester where quiescent conditions promote liquid-solids separation.

The digested material is thickened and dewatered on three Winklepress belt presses (Alfa Laval) and produce biosolids cake at 19-22% solids. The

Kline's Island Wastewater Treatment Plant PERMIT AND PERFORMANCE			
	INFLUENT	EFFLUENT	PERMIT
BOD	157 mg/L	6 mg/L	20 mg/L
TSS	166 mg/L	6 mg/L	<30 mg/L
Ammonia	21 mg/L	1.5 mg/L	5 mg/L spring/summer 15 mg/L fall/winter

authority's trucks haul it to a site owned and operated by Synagro, which distributes the material for land application.

Biogas is fully used as an energy resource. It fuels a Biogen generator that produces electricity, which the plant exports to the Pennsylvania Power and Light grid. It makes up about half the total plant power draw. Heat from the generator is captured to heat the sludge in the primary digesters. If the BioGen system goes down, the plant can switch to natural gas.

The nearest homes to the plant are less than a quarter mile away and the plant used to experience frequent odor complaints. Since the 1980s those issues have disappeared thanks to an odor-control system consisting of 40-foot-high fiberglass towers that use an atomized sodium hypochlorite mist. The mist and odorous air react as they pass up through the tower. There are 12 towers, positioned at the settling tanks, the plastic media filters, the thickening tanks and the dewatering building.

Plant manager Gary Saunders believes in including operations team members in project design and execution.

Kline's Island has a biogas-to-energy system that can provide about 50% of the plant's electricity.

Despite the age of the plant, it is fully automated and equipped with the latest data and information systems. The SCADA system is from Kapsch; CityWorks supplied the computerized maintenance management system, and the laboratory information management system is from Hach.

Plant performance is excellent. From an influent loading of 157 mg/L BOD and 166 mg/L TSS, Kline's Island produces an effluent discharge with less than 6 mg/L each. Effluent ammonia nitrogen is 1.5 mg/L.

The authority's 5.75 mgd regional pretreatment facility at Fogelsville pretreats high-strength waste from several large industrial customers, supporting high performance at Kline's Island.

DUAL LICENSING

Fifty employees staff the plant, some doing double duty. Saunders explains that about one-third of the staff is responsible for operation and maintenance of the authority's 30 mgd drinking water treatment plant, as well as the wastewater facility.

Key team members are Joseph Westfall, assistant plant manager; Bryan Geissel, project manager; Justin Silberman, maintenance manager; Gretchen Schleppy, lab manager; Andrew Moore, compliance manager; John Parsons, chief operations officer; and Mark Kudera, maintenance crew leader. "We have 18 operators and two supervisors rotating between the two facilities every two months, working 12-hour shifts," Saunders says.

> "Our operators are certified and licensed in both wastewater and drinking water plant operations."
>
> **GARY SAUNDERS**

Saunders says the split works well because many of the procedures, such as pump maintenance and chemical addition, are the same or similar, even though the treatment processes are not. The dual experience "helps greatly in covering shifts," he says. "Our operators are certified and licensed in both wastewater and drinking water plant operations."

LOTS OF IDEAS

Such an experienced and knowledgeable staff helps improve operations. "Our progression to move away from gaseous chlorine is a good example," Saunders says. "We had 16 one-ton cylinders on site for use in the chlorine contact chamber, but now we're moving to sodium hypochlorite, primarily

(continued)

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Lab technicians Linda Zaoudeh (right) and Renee Vogel run weekly and daily samples in the Kline's Island lab.

for safety reasons. Our personnel were involved in the design and execution of the project."

In another instance, operators identified reliability issues with the dewatering equipment. The most viable suggestion was to bring in a consultant to troubleshoot the process, identify issues and show operators how to deal with problems successfully.

And Kline's Island is not stopping there. Faced with an old electrical distribution system installed in the 1970s, the plant is in the design phase for new motor control centers, along with new breakers and substations. Age and reliability are the reasons behind the changeout.

An electronic plant services site using Microsoft SharePoint helps keep the operators up to date on what is happening at both plants. "Operators at each plant can see the same shared page and will create a blog entry in the operators' blog for each shift at each plant," Saunders says.

"They document anything significant that happened on the shift that would be important for the other operators and management to know: pump changes, equipment failures, equipment rotation and any other irregularities during the shift.

Management also writes announcement entries that are at the top of the webpage to convey important information that future shifts need to know. With all this information in one spot, an operator stationed at one plant can keep up to date on what's happening at the other plant and can be ready when it's their time to change plants."

THE OLD FISHING HOLE

When a treatment plant has been around for nearly 100 years, there are bound to be some good stories. That's true at Kline's Island, where Gary Saunders, plant manager, recalls a fishing tale.

"Before we started trucking our biosolids offsite, we would give the dewatered cake away to area residents who wanted to use it on their lawns or in their flower gardens," he says.

"One day, an old-timer came by to pick some up like he used to. When we explained that we didn't do that anymore, he started to recall the days before all the improvements and regulations and procedures were in place.

"He told me he used to come down here to fish in the hole where the effluent dropped into the Lehigh River. 'That was the best fishing spot around,' he said."

The story got even better when the man told Saunders that he used to get his worms right out of the big rock media tricking filter.

DEALING WITH WEATHER

Wet-weather flows are another issue. Flows can reach 90-95 mgd in extreme conditions, causing the plant to bypass into a stream. "Once the influent flow reaches 84 mgd, a few of the key processes have reached their capacity," says Saunders. "At that point we begin to throttle down our influent gates to maintain the 84 mgd flow rate in order to protect the facility."

Any flow above this amount is diverted untreated to the Little Lehigh Creek through a 48-inch bypass line. "We do everything within our power to prevent this from happening, but Mother Nature doesn't always play by our rules," Saunders says. The authority, the City of Allentown and the Pennsylvania Department of Environmental Protection are discussing ways to mitigate the bypass flows.

Finally, the 90-year-old rock media trickling filter is performing well but will be evaluated for replacement. Although it has operated reliably for many years and has enabled the plant to meet nitrogen requirements, debris has never been cleaned out of the media, Saunders says.

As part of the regional sewage facilities planning now under way, the rock media filters will be evaluated for replacement, possibly by new plastic media filters and a new pump station. The progress continues. tpo

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A Gadget No More

AUGMENTED REALITY BECOMES A POTENT TOOL IN THE KIT FOR OPERATORS LOOKING TO OPTIMIZE PERFORMANCE AND LOWER COSTS IN TREATMENT FACILITIES

By Ted J. Rulseh

Many of us are used to thinking of augmented reality as some kind of gimmick — an exhibit at a county fair or trade show where we put on special goggles and get immersed in a new view of the world.

It's cool, we think, but nothing of much practical value. But that's where we are wrong. Augmented reality (a cousin of the more complex virtual reality) is coming into its own as a tool with a variety of applications in work settings, including water and wastewater treatment facilities.

Among much else, it's a way of connecting plant operators remotely with technical experts who cannot only tell but show them precisely how to monitor a piece of equipment, perform maintenance, make repairs and more. It doesn't necessarily require fancy equipment; in many cases a tablet computer or smartphone is enough.

Veolia North America now provides augmented reality as part of its Hubgrade platform, which combines a portfolio of digital solutions with human expertise. The platform uses artificial intelligence, advanced machine learning, augmented reality tools and more.

It encompasses a wide range of digital solutions for monitoring, evaluating and optimizing facilities and infrastructure. Veronique Bourgier, vice president of strategy and growth, and Melissa Demsky, senior director of asset management for municipal water, talked about augmented reality technology in an interview with *Treatment Plant Operator*.

tpo: What is the rationale for promoting augmented reality at this juncture?

Bourgier: It started with an examination of what can we do to better monitor and optimize the plants operated by Veolia North America, of what is actually possible. Augmented reality is not a gadget anymore. It is fully industrialized. The technology is now well adapted to a variety of industrial environments. There are a lot of recent evolutions of in the augmented reality world that make it useful for daily tasks.

> "For those who have seen or used Pokémon Go, that is an example of augmented reality. You're seeing reality, but through your phone you see that reality with something layered on top." MELISSA DEMSKY

tpo: For operators not familiar with it, how would you describe augmented reality in simple terms?

Demsky: For those who have seen or used Pokémon Go, that is an example of augmented reality. You're seeing reality, but through your phone you see that reality with something layered on top. In this case, a technical expert can layer something on top of a plant operator's reality, so they can see what the expert is trying to share or show, specific to the equipment in question.

tpo: In an operator's daily work life, how might augmented reality come into play?

Demsky: One example is connecting with technical experts who may live across the country. Suppose that an operator is facing a situation not seen before — the way a basin is operating, how a process is reacting, what an analyzer is showing, the way the sludge looks. Instead of just looking at a picture, the operator and the technical expert can actually see the issue in person, together, and walk through and troubleshoot at the same time.

tpo: What is necessary for a facility to be able to use augmented reality?

Demsky: We have partnership with a company that has the licensing and the ticket system to enable the technology.

Bourgier: We use two kinds of licenses: a permanent license and temporary single-use license. The temporary license enables us, in an emergency, to send a license to an operator on site to be used right away.

tpo: What hardware devices can be used for the actual augmented reality experience?

Bourgier: At the beginning, augmented reality was only available with smart glasses, but we wanted more flexibility. We can't say to a customer, "Wait three days and we will send you the smart glasses." So we can also use a tablet or smartphone, depending on what they need to do. At the same time, the smart glasses are fully industrialized. Users can mount them on a hardhat. They have voice control, noise cancellation and voice recognition features. Smart glasses are better for working on devices because the operators can have their hands free. They can listen to advice and recommendations from an expert and at the same time turn a valve or calibrate an instrument.

tpo: Can you provide a specific example of how this works?

Demsky: Consider a pump where our remote support person wants to help an operator perform a vibration analysis. While that operator is looking through the glasses, the expert can point and say, "Attach the probe at this point on the pump. Now let's walk through how to take a reading. And here's what that reading is telling us." This is as opposed to sharing a picture or a video. It's an active, in-person dialog; that remote technician can see exactly what the operator is doing.

tpo: Looking at the bigger picture, can you share an example where augmented reality has had an impact on an entire facility?

Demsky: In the midst of the pandemic when travel was limited, we still had obligations for condition assessment to help facility teams build capital plans. A wastewater treatment facility in Hollister, California, was the site of a pilot project to see how augmented reality might help a remote expert to use predictive maintenance tools to investigate the condition of equipment. We went through a process over several weeks with the on-site field technicians, working with the technology and performing the analyses. We came away with a very strong condition assessment. This is just one example of bringing field staff and remote experts together across the distance to overcome travel challenges.

tpo: What are some other areas where you see augmented reality as being potentially beneficial?

> "At the beginning, augmented reality was only available with smart glasses, but we wanted more flexibility. So we can also use a tablet or smartphone." **VERONIQUE BOURGIER**

Bourgier: Augmented reality can be used in many applications. For training we have a recall feature; the operator can recall the task at any time. We can also use augmented reality to create a knowledge library to include, for example, step by step instructions for specific repair or maintenance task. Then we can create videos for use in training new hires. There are uses for augmented reality at every step: commissioning, troubleshooting, maintenance, operations, just to mention a few.

tpo: What would you say are the most essential benefits of augmented reality?

Demsky: Ultimately it comes down to cost savings, because it's going to help extend the life of equipment and enable better compliance by providing access to expertise in a very quick and technical way. For example, collection system managers can connect with collection crews out in the field, so when they run into something, they don't have to come back to the office and explain the issue.

tpo: How would you assess the future of augmented reality?

Demsky: The possibilities are endless. The more people try it, the more ideas they have for using it. It's a process of experimentation to see what works and what doesn't, but having people with different expertise trying different ways to use the technology, we're going to see continuous improvement as we move forward. **tpo**

SJE acquires Ohio Electric Control

SJE announced it has purchased Ohio Electric Control. Located down the street from SJE's existing facility in Ashland, Ohio, OEC brings to the partnership expertise in control solutions and strong customer relationships. Through the purchase, SJE will be able to offer additional technical resources and manufacturing capabilities that will augment OEC's current capacity and provide access to a broader product offering.

Aries finishes biosolids gasification plan

Aries Clean Technologies announced the completion of its Linden Biosolids Gasification Plant in Linden, New Jersey. The fluidized bed gasification plant's commissioning is underway and is expected to be completed over the next few months. At full capacity, the plant will process 430 tons of biosolids daily (130,000 tons per year) diverting it from local landfills. This will also result in the production of approximately 22 tons per day of beneficial Bio-Fly-Ash, a renewable product that will be sold as an additive to local concrete companies. The plant is located in a repurposed building within the Linden Roselle Sewerage Authority complex.

Envirosuite commences two strategic agreements with GHD

Envirosuite has entered a new phase in the rollout of EVS Water with two new strategic agreements with GHD, a consulting group with 200 offices on five continents. Under the agreements, GHD will support the scaling of implementation of EVS Water for major water treatment facilities as well as refer prospective clients to Envirosuite. GHD is an existing Envirosuite customer and user of the EVS Water Plant Designer product, a solution for the design and improvement of water and wastewater treatment infrastructure.

Mazzei Injector promotes Bennett to VP


Justin Bennett

Mazzei Injector promoted Justin Bennett to vice president of engineering and operations. He joined the company in 2005 and has performed in several key roles during his tenure. Since 2013 he has served as director of engineering and development overseeing Mazzei's production and design efforts. In addition, he coordinated with the sales and research and development teams on new product development and on optimization of existing Mazzei products. In his new role, Bennett will develop and implement long-range programs to improve quality, timeliness of completion and cost efficiency of production and fabrication.

Xylem Partners with UNICEF

Xylem Watermark, the corporate social responsibility program of Xylem, aims to reach over 3.4 million children by end of 2023 through its support of UNICEF. Aligned with the UN Sustainable Development Goals, the partnership seeks to improve awareness of water, sanitation and hygiene in India's most vulnerable communities, with a focus on strengthening WASH protocols in schools and pre-schools, known as anganwadi centers.

Syrinix expands distribution in California

Syrinix expanded its distributor network to 11 with California-based D&H Water Systems. The announcement marks the company's first partnership in the state, enhancing water and wastewater monitoring capabilities in a region severely impacted by unprecedented drought conditions. In a release, Syrinix's CEO James Dunning says, "Some of our largest customers are in the states served by D&H: California and Nevada. We are hopeful that together, we can better serve our existing clients as they work toward a more water-efficient future, as well as prospects prioritizing water infrastructure improvements in years to come."

Endress+Hauser expands flow calibration capabilities

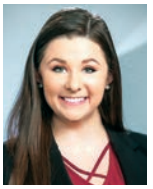
Endress+Hauser expanded its calibration capabilities in the U.S. with a new flow calibration rig located at the company's recently inaugurated Houston campus. The rig will service customers' flowmeters, including those from third-party vendors, and will have expanded line size and flowrate capabilities.

Watts promotes RuralWaterDirect.com program

For every order placed on RuralWaterDirect.com, the site will donate funds to the Planet Water Foundation to provide one person with access to clean water for an entire year. Planet Water is a nonprofit organization focused on bringing clean water access and water health and hygiene education programs to communities in need around the world. The products found at RuralWaterDirect.com are designed by farmers to withstand rough use and extreme weather conditions.

ABB employees recognized for excellence in STEP programs


Tracy Long


Victoria Tester

The Manufacturing Institute recognized Tracy Long, ABB's global head of communications for the NEMA Motor Division, as a STEP (Science, Technology, Engineering and Production) Ahead honoree and Victoria Tester, ABB supply chain manager for NEMA Motors, as an Emerging Leader in Washington, D.C. The STEP Ahead Award honors women who have demonstrated excellence and leadership in their careers and represent all levels of the manufacturing industry, from the factory floor to the C-suite.

Anue Water partners with Koester Associates

Anue Water Technologies announced Koester Associates as its new and exclusive channel partner for the sales and installation of all Anue Water products throughout the state of New York and northern New Jersey. tpo

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Ashland Pump 1899 Cottage St., Ashland, OH 44805 855-281-6830 • Fax: 877-326-1994 www.ashlandpump.com								YES	YES
Blue-White See ad on page 2 **Blue-White Industries** 5300 Business Dr., Huntington Beach, CA 92649 714-893-8529 • Fax: 714-894-9492 info@blue-white.com • www.blue-white.com			YES				YES		
CRANE PUMPS & SYSTEMS See ad on page 11 **Crane Pumps & Systems** 420 Third St., Piqua, OH 45356 937-778-8947 cranepumps@cranepumps.com • www.cranepumps.com		YES		YES	YES	YES		YES	YES
Dynamatic See ad on page 27 **DSI Dynamatic** 7900 Durand Av., Bldg. 3, Sturtevant, WI 53177 800-545-2169 • 262-554-7977 • Fax: 262-554-7041 sales@dynamtic.com • www.dynamatic.com									
EBARA **EBARA Pumps Americas Corporation** 1651 Cedar Line Dr., Rock Hill, SC 29730 803-327-5005 info@pumpsebara.com • www.pumpsebara.com		YES				YES		YES	YES
epic INTERNATIONAL Environmental Products for Innovative Conservation **EPIC INTERNATIONAL, Inc.** 10993 Richardson Rd., Ashland, VA 23005 804-798-3939 • Fax: 804-798-9175 try@epicintl.com • www.epicintl.com	YES								
FLSmidth See ad on page 55 **FLSmidth Inc.** 7158 S FLSmidth Dr., Midvale, UT 84047 801-821-1000 info-us@flsmidth.com www.flsmidth.com		YES		YES			YES		YES
Franklin Electric See ad on page 25 **Franklin Electric** 9255 Coverdale Rd., Fort Wayne, IN 46809 260-824-2900 franklinwater@fele.com • www.franklinengineered.com		YES			YES	YES		YES	YES
GLOBAL PUMP **Global Pump** 10162 E Coldwater Rd., Davison, MI 48423 866-360-7867 • 810-653-4828 • Fax: 810-658-0632 sales@globalpump.com • www.globalpump.com		YES			YES	YES			
GR GORMAN-RUPP PUMPS See ad on page 23 **Gorman-Rupp Company** 600 S Airport Rd., Mansfield, OH 44903 419-755-1011 • Fax: 419-755-1251 grsales@gormanrupp.com • www.GRpumps.com		YES				YES		YES	
HAWKINS See ad on page 53 **Hawkins Water Treatment Group** 2381 Rosegate, Roseville, MN 55113 800-328-5460 • 612-331-6910 john.andren@hawkinsinc.com www.hawkinsinc.com/groups/equipment		YES	YES				YES		
HYDRA-TECH PUMPS See ad on page 45 **Hydra-Tech Pumps** 167 Stock St., Nesquehoning, PA 18240 570-645-3779 • Fax: 570-645-4061 htpump@hydra-tech.com • www.hydra-tech.com		YES		YES		YES			YES

High Pressure	Metering	Peristaltic	Piston/Plunger	Progressive Cavity	Pump Alignment/ Vibration	Pump Controls	Pump Parts/ Components	Pump Repair/ Service	Rotary Lobe	Solids/Sludge	Submersible	Vertical/ Lift Station	Other
							YES			YES	YES		
	YES	YES											
YES				YES			YES	YES		YES	YES	YES	
						YES							Drives
						YES	YES	YES		YES	YES	YES	
						YES	YES	YES		YES			
YES						YES	YES				YES	YES	
			YES				YES	YES	YES	YES	YES	YES	
YES						YES	YES	YES		YES	YES	YES	
	YES	YES					YES						
										YES	YES		

(continued)

Pumps DIRECTORY 2022

tpo TREATMENT PLANT OPERATOR

	Archimedes/ Screw	Centrifugal	Chemical Feed	Chopper	Deep Well	Dewatering/ Bypass	Diaphragm	Effluent	Grinder/ Sump
IWAKI America 5 Boynton Rd., Holliston, MA 01746 508-429-1440 info@iwakiamerica.com • www.iwakiamerica.com		YES	YES				YES		
JDV Equipment Corporation 1 Princeton Ave., Dover, NJ 07801 973-366-6556 sales@jdvequipment.com • www.jdvequipment.com See ad on page 35		YES		YES					
Komline-Sanderson 12 Holland Ave., Peapack, NJ 07977 800-225-5457 • 908-234-1000 • Fax: 908-234-9487 info@komline.com • www.komline.com See ad on page 54						YES			
Lakeside Equipment Corporation 1022 E Devon Ave., Bartlett, IL 60103 630-837-5640 • Fax: 630-837-5647 sales@lakeside-equipment.com www.lakeside-equipment.com See ad on page 3	YES								
Lutz-JESCO America Corp. 55 Bermar Park, Rochester, NY 14624 800-554-2762 • 585-426-0990 • Fax: 585-426-4025 mail@jescoamerica.com • www.lutzjescoamerica.com		YES	YES				YES		
Penn Valley Pump Co., Inc. 998 Easton Rd., Warrington, PA 18976 800-311-3311 • 215-343-8750 • Fax: 215-343-8753 info@pennvalleypump.com • www.pennvalleypump.com See ad on page 4			YES				YES		
Philadelphia Gear, Power Systems by Timken 935 First Ave. 2nd Fl., Ste. 200, King of Prussia, PA 19406 800-766-5120 • 610-265-3000 • Fax: 610-337-5637 info@philagear.com • www.philagear.com									
PRIMEX 22650 Cty. Hwy. 6, Detroit Lakes, MN 56501 218-847-1317 • Fax: 218-847-4617 info@primexcontrols.com • www.primexcontrols.com									
Proco Products, Inc. 2431 N Wigman Dr., Stockton, CA 95205 800-344-3246 • 209-943-6088 • Fax: 209-943-0242 miquelm@procoproducts.com • www.procoproducts.com									
Pulsafeeder, Inc. 27101 Airport Rd., Punta Gorda, FL 33982 800-333-6677 • 941-575-3800 ppgspotech@idexcorp.com • www.pulsatron.com			YES				YES		
SealRyt Corp. 64 Servistar Industrial Way, Westfield, MA 01085 413-564-5202 mail@sealryt.com • www.sealryt.com See ad on page 9									
Smith & Loveless, Inc. 14040 Santa Fe Trail Dr., Lenexa, KS 66215 800-898-9122 • 913-888-5201 answers@smithandloveless.com www.smithandloveless.com		YES						YES	

High Pressure	Metering	Peristaltic	Piston/Plunger	Progressive Cavity	Pump Alignment/ Vibration	Pump Controls	Pump Parts/ Components	Pump Repair/ Service	Rotary Lobe	Solids/Sludge	Submersible	Vertical/ Lift Station	Other
YES	YES					YES				YES			
										YES	YES		
YES			YES			YES	YES	YES		YES			
YES	YES	YES		YES		YES	YES	YES					
			YES							YES			
					YES	YES	YES	YES					
						YES							
					YES								
	YES	YES				YES	YES	YES					
							YES	YES					Pump Seals
						YES	YES			YES		YES	Grit Pumps

(continued)

Pumps DIRECTORY 2022

tpo TREATMENT PLANT OPERATOR

	Archimedes/ Screw	Centrifugal	Chemical Feed	Chopper	Deep Well	Dewatering/ Bypass	Diaphragm	Effluent	Grinder/ Sump
Sulzer Pumps Solutions, Inc. 140 Pond View Dr., Meriden, CT 06450 800-525-7790 • 203-238-2700 • Fax: 203-238-0738 info.abs.usa@sulzer.com • www.sulzer.com See ad on page 37		YES		YES	YES	YES		YES	YES
United Rentals, Inc. 100 First Stamford Place, Ste. 700, Stamford, CT 06902 800-877-3687 www.UnitedRentals.com See ad on page 7						YES			
Vaughan Company, Inc. 364 Monte-Elma Rd., Montesano, WA 98563 888-249-2467 • 360-249-4042 • Fax: 360-249-6155 info@chopperpumps.com • www.chopperpumps.com See ad on back cover	YES	YES		YES		YES		YES	YES
Vertiflo Pump Company 7807 Redsky Dr., Cincinnati, OH 45249 513-530-0888 • Fax: 513-530-0893 sales@vertiflopump.com • www.vertiflopump.com		YES				YES		YES	YES

High Pressure	Metering	Peristaltic	Piston/Plunger	Progressive Cavity	Pump Alignment/ Vibration	Pump Controls	Pump Parts/ Components	Pump Repair/ Service	Rotary Lobe	Solids/Sludge	Submersible	Vertical/ Lift Station	Other
YES						YES	YES	YES		YES	YES	YES	
YES											YES		
							YES			YES	YES	YES	Hydraulic Mixing
										YES	YES	YES	Stormwater

(Blowers Directory follows on page 44)

Blowers DIRECTORY 2022

tpo TREATMENT PLANT OPERATOR

		CENTRIFUGAL			POSITIVE DISPLACEMENT		
		Multistage	Single Stage	High-Speed Turbo	Rotary Lobe	Hybrid	Rotary Screw
AERZEN See ad on page 15	**Aerzen** 108 Independence Way, Coatesville, PA 19320 610-380-0244 aerzen@aerzenusa.com • www.aerzen.com/en-us	YES	YES	YES	YES	YES	YES
Atlas Copco See ad on page 31	**Atlas Copco Compressors** 300 Technology Center Dr., Ste. 550, Rock Hill, SC 29730 866-546-3588 info@atlascopcousa.com • www.atlascopco.us	YES	YES	YES	YES	YES	YES
EurusBlower See ad on page 17	**Eurus Blower, Inc.** PO Box 4588, Wheaton, IL 60189 630-221-8282 • Fax: 630-221-1002 tomh@eurusblower.com • www.eurusblower.com	YES			YES		
Howden See ad on page 35	**Howden** 900 W. Mount St., Connersville, IN 47331 800-557-6687 • 765-827-9200 • Fax: 765-827-9317 inquiries.usa@howden.com • www.howden.com	YES	YES	YES	YES		
inovair See ad on page 45	**Inovair** 14601 W 114th Terrace, Lenexa, KS 66215 855-466-8247 • 913-469-7244 • Fax: 913-338-2879 sales@inovair.com • www.inovair.com		YES	YES			
JFH DISTRIBUTING INC. See ad on page 54	**JFH Distributing, Inc.** 1075 So. Yukon St., Ste. 100, Lakewood, CO 80226 800-279-7796 • 303-279-7797 dfh@jfhco.com • www.jfhprocess.com			YES	YES	YES	YES
KAESER COMPRESSORS See ad on page 32	**Kaeser Compressors** 511 Sigma Dr., Fredericksburg, VA 22408 540-898-5500 https://us.kaeser.com			YES	YES		YES
Spencer See ad on page 37	**Spencer Turbine Co., a Howden Company** 600 Day Hill Rd., Windsor, CT 06095 860-688-8361 inquiries.usa@howden.com • www.howden.com	YES	YES	YES			
SULZER See ad on page 37	**Sulzer Pumps Solutions, Inc.** 140 Pond View Dr., Meriden, CT 06450 800-525-7790 • 203-238-2700 • Fax: 203-238-0738 info.abs.usa@sulzer.com • www.sulzer.com			YES			

OZ Lifting Products CompOZite davit crane

OZ Lifting Products' patented CompOZite davit crane is made of advanced composite materials making it 40% lighter than equivalent capacity steel davits. With a total weight of only 83 pounds for the boom, mast and winch combined, a single crane is commonly moved to multiple base locations throughout a treatment plant. A ratchet screw jack allows the user to adjust the boom from horizontal to 45 degrees while under load and the 360-degree rotation of the crane allows a full range of motion. Smart-latch technology at the boom/mast means no tools are required for assembly. A zinc-plated finish on all non-composite parts provides added corrosion protection. AC and DC electric winches are optional or a manual winch comes standard with a drill drive adapter. The cranes are made in the U.S. and each one is individually tested and certified at 125%.
800-749-1064;
www.ozliftingproducts.com

Patterson Mfg. davit crane

New davit cranes are available from corrosive environment and safety experts Patterson Mfg. Give your operations a lift with models in 1/2- and 1-ton capacities. The cranes exhibit the company's hallmark safety, simplicity and durability, with key features such as a reliable brake with long life and readily available parts, a hot-dipped galvanized finish and no plastic sheaves or pulleys. They put safety and simplicity within your reach with a low maintenance, easy-to-assemble design that is made in the USA. For over 160 years, Patterson has been a trusted supplier of winches, rigging, fittings and custom products for lifting applications in the marine, construction and mining markets. These davit cranes continue to deliver the company's promise of helping businesses run safer, easier and faster. Find out how our team and products can improve employee safety and positively impact your bottom line.
800-322-2018;
www.pattersonmfg.com/davit-cranes

product spotlight

wastewater

Check valve offered with AIS compliance for water and wastewater systems

By Craig Mandli

The pump discharge check valve is an essential element in the design of water and wastewater pumping systems. The valves work to protect valuable pump equipment, automatically opening to allow for forward flow and automatically returning to the closed position to prevent reverse flow when the pump is not in operation. The **Flo-Flex Model 745 rubber disc swing check valve** from **Flomatic Valves** provides the water and wastewater industry one of the broadest lines of flexible rubber disc swing checks available on the market today.

Constructed for industrial and municipal applications, these check valves include a strong ductile iron body coated (internally and externally) with a fusion-bonded epoxy coating, a fast-paced 45-degree valve-seat angle for short disc travel distance, and non-slam high performance resulting in the reduction of water hammer. It is also available in an AIS-compliant model.

"We felt it was extremely important to add an AIS-compliant check valve to our 745-swing check model line," says Jim Tucci, national sales manager at Flomatic Valves. "It includes all the same features as our traditional Model 745 with additional benefits such as a raised body boss, which is drilled, tapped and plugged for easy installation of gauges or accessories."

Flo-Flex Model 745 from Flomatic Valves

Manufactured according to ANSI/AWWA C508-01 standards, the Model 745 provides the industry a broad lines of flexible rubber disc swing checks featuring a maximum temperature of 140 degrees F, pressure max of 250 psi, vertical or horizontal installation, stainless steel hardware, a standard drain plug, a Buna-N coated disc rubber seal, low headloss for a smooth operation, and ease of accessibility for installation and serviceability. It is available in a size range of 3 to 12 inches, providing the water and wastewater industry with one of the broadest lines of flexible rubber disc swing checks available on the market today, according to Tucci.

"The valve's short disc travel allows for faster closure. Its valve body flow area is equal to nominal pipe area," says Tucci. "It offers easy in-line serviceability, and it can be installed for vertical flow or in a horizontal direction. Its precision molded valve disc is a one-piece construction, with integral O-ring type sealing."
800-833-2040; www.flomatic.com

Walchem, Iwaki America Intuition-9 controller

Walchem, Iwaki America's new water treatment controller, the Intuition-9, provides versatility and a collection of sensors plus powerful built-in algorithms for control of chemical metering pumps and valves in a broad range of water treatment applications. The large, full-color touchscreen display with icon-based programming makes setup easy. Remote communications capabilities through ethernet, Wi-Fi, BACnet or Modbus/TCP. Email alarm messages, datalogs, graphs or system summary reports.
508-429-1110; www.walchem.com

De Nora ClorTec SD disinfectant generator

De Nora's ClorTec SD disinfectant generator produces a ready-to-use chlorine-based disinfectant that kills 99.9% of germs when used as directed. The systems' solution use

product spotlight water

Automated ball valve includes smart technology

By Craig Mandli

It's no secret that municipal water treatment is becoming smarter. Automated monitoring and treatment devices make the process easier and more consistent for operators. Water filtration pioneer Rusco recently unveiled the Rusco Smart Ball Valve that employs smart technology into how the valve itself operates.

Compatible with leading smart hubs, including Amazon Alexa and Google Home, the **Rusco Smart Ball Valve** is app-driven and pairs easily with Apple and Android devices. Its connectivity allows for program automation, simplifying two primary functions — sediment flushing and flow shut-off. Not only can it be used in commercial and municipal water treatment applications, it can also be employed in home filtration and well water applications, and is offered in both Wi-Fi and Zigbee models, ensuring maximum access to the technology.

"When I joined the team last year, right in the heart of the pandemic, one of my first priorities was to energize our staff, as well as our strong distributor and customer base," says Michael Klump, president of Rusco. "Updating our product line to improve quality of life felt like the perfect solution. We look forward to delivering Rusco's promise with the smart ball valve, as well as additional developments in the pipeline for next year."

Although the smart ball valve can serve as a standalone shut-off valve, it can also be combined with a Rusco Spin-Down Filter, Sediment Trapper or similar product from a competing brand for optimum use. By properly removing sediment from the water supply, users can extend the life of filter media and other treatment components, while also protecting personal well-being. According to Klump, research has drawn correlations between sediment and health risks, including exposure to harmful bacteria and viruses, CECs and dissolved metals.

"Oftentimes faced with limited capacity, it's reassuring to know that our smart ball valve can be activated anywhere with the simple click of a button," says Klump. "We love the motto 'set it and forget it,' which is even easier to say now that everything runs through an app. Alerts are sent in real-time if something interrupts normal operation, and new units are equipped with standard power fail safe shutoff — both providing peace of mind for our customers."

800-345-1033; www.rusco.com

Smart Ball Valve from Rusco

three common ingredients — water, salt and power — to produce disinfectant using an electrolytic cell equipped with De Nora proprietary DSA electrodes. Hospitals, senior care facilities, janitorial cleaning companies, schools and other U.S.-located businesses can quickly meet their surface disinfection needs by making their own effective disinfectant where they need it, when they need it, using safe, readily available ingredients.

215-997-4000; www.denora.com

ABB AquaMaster4 mobile comms flowmeter

ABB's AquaMaster4 mobile comms flowmeter is a wireless solution for continuous flow measurement, the logging of accurate data and communication of information. With its connectivity on 4G-LTE and NB-IoT networks, the electromagnetic flowmeter enables 60% lower power consumption, identifying leaks 10 times faster than the market standard. With bidirectional connectivity, the AquaMaster4 provides near-real-time data used for intelligent water management. Operators can be hundreds of miles away and read values from the device remotely, giving them access to manage the device and their operations wherever they are located and at any time. Historical logged values of pressure, flow rate, alarms, battery life and activity record can also be retrieved remotely.

800-435-7365; www.abb.com

INDCO HS-100 and HS0300 benchtop dispersers

INDCO HS-100 and HS-300 series benchtop dispersers can mix up to five gallons of materials at a time, making them ideal for a wide range of high shear applications within labs, pilot plants and small-scale production environments. Each unit comes with a 1 1/2 to 3 hp motor, a 1-inch-by-19-inch stainless steel shaft, and either a 4-inch or 5-inch stainless steel disperser blade. A mechanical hand knob or AC variable speed drive allows varying of shaft speed from 1,000 to 4,100 rpm to achieve desired shear within the mixing chamber. Pre-lubricated heavy duty ball bearings ensure a long service life. An air lift with an easy-to-use toggle valve raises and lowers the pneumatic cylinder 15 inches to allow placement of a holder with capacity to 5-gallon pail (air lift requires approximately 5 cfm at 40 to 50 psi). All wetted parts are constructed from 300 series stainless steel.

800-851-1049; www.indco.com tpo

Pumps and Blowers

By Craig Mandli

Chopper Pumps

VAUGHAN SELF-PRIMING CHOPPER PUMP

Self-priming Chopper Pumps from Vaughan

Self-priming Chopper Pumps from Vaughan are designed to be easily accessed outside of the wet well while pumping waste solids at heavy consistencies, without plugging or dewatering of the solids. They eliminate the loss in production and mess, along with making it easy to service the pump to get it back in operation. **888-249-2467; www.chopperpumps.com**

Effluent Pumps

Heavy-duty effluent pumps from Ashland Pump

ASHLAND PUMP EFFLUENT PUMPS

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

VERTIFLO PUMP COMPANY SERIES 1600

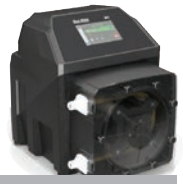
Vertiflo Pump Company's Series 1600 horizontal close-coupled, vortex end-suction pumps have a wide range of applications including food processing solids, wastewater treatment, pollution control, slurries and solids. They have capacities to 1,600 gpm, heads to 170 feet TDH, and operate at temperatures to 250 degrees F. These pumps are designed with a variety of constructions such as cast iron, 316 stainless steel fitted, all 316 stainless steel, alloy 20 or CD4MCu. They are designed with a convenient back pull-out cost-saving feature to allow for easy inspection or maintenance without disturbing the piping to the pump. The impeller has a fully recessed design, which accommodates passage of solids. All impellers have wiping vanes, which reduce axial loading and prevent dirt from entering the sealing area. The impeller is keyed to the shaft and an impeller locking screw assures positive attachment. **513-530-0888; www.vertiflopump.com**

Series 1600 pumps from Vertiflo Pump Company

Peristaltic Pumps

BLUE-WHITE INDUSTRIES FLEXFLO M4

The low shearing, gentle pumping action of the FLEXFLO M4 peristaltic pump from Blue-White Industries allows for smooth, continuous and precise dosing of long chain polymers and chemicals that off-gas, including peracetic acid and sodium hypochlorite. It doesn't experience vapor lock or loss of prime. It includes a highly responsive and intuitive 5-inch display screen that's as simple to operate as a cellphone and can be easily operated even when wearing work gloves. In addition to legacy communications such as 4-20mA, it offers advanced communication protocols including Profibus, Modbus TCP and Ethernet IP. Further, it includes firmware that can be field updated as technology advances. It saves time and money with easy-to-attach M12 connectors for fast, clean and watertight connections. The pump has built-in tube failure detection and requires very little maintenance. It has a 10,000:1 turndown ratio, and NEMA 4X (IP66) washdown. **714-893-8529; www.blue-white.com**



FLEXFLO M4 peristaltic pump from Blue-White Industries

Rotary Lobe Pumps

BLUEline NOVA Rotary Lobe Pump from Boerger

BOERGER BLUELINE NOVA ROTARY LOBE PUMP

Boerger's BLUEline NOVA Rotary Lobe Pump achieves volumetric efficiencies using DIUS rotors combined with a flow-optimized pump chamber to ensure smooth running even at high pressures. It is available with or without a casing protection. The "clean" version has been designed for conveying pure, non-abrasive media. A casing protection is not required. A radial and axial casing protects the entire pump casing. The protection plates and liners are perfectly integrated into the pump casing in a flow-optimized design. A fastening system ensures efficiency. **612-435-7300; www.newblueline.com**

Slip Pumps

Stainless steel triplex pumps from Cat Pumps

CAT PUMPS STAINLESS STEEL TRIPLEX PUMPS

Cat Pumps stainless steel triplex pumps mounted to a gear motor can provide thousands of hours of maintenance-free slip pump service. Direct-coupling the pump to a gear motor offers many advantages, including a smaller footprint, reduced noise and ease-of-service with no belts to maintain. A 316 stainless steel manifold, paired with elastomers like NBR, FPM, EPDM or PTFE, allows many chemical and fluid compatibility options. Performance specifications range from 0.1 to 100 gpm and 100 to 10,000 psi. Custom-built power units can include pump(s), motor(s), base, pressure control valves, pressure gauges and/or pulsation dampeners. Custom builds typically have a three to four-week lead time, with individual pumps and repair parts usually being in-stock items, with 95% of orders shipped within 24 hours of placement. **763-780-5440; www.catpumps.com**

Solids/Sludge Pumps

HYDRA-TECH PUMPS S4VHL

The S4VHL 4-inch hydraulic submersible sludge/slurry pump from Hydra-Tech Pumps offers 3-inch solids handling and head capabilities

up to 210 feet. This heavy-duty slurry pump is designed to handle wastewater and sewage and will fit through a 20-inch-diameter manhole. Its primary applications are sewer bypass into force mains and general transfer of solids-laden fluids. Combined with HT25 to HT60 power units, it is capable of flows up to 750 gpm. This safe and variable-speed hydraulic drive submersible pump can be used where electric power is hazardous or impractical. **570-645-3779; www.hydra-tech.com**

S4VHL pump from Hydra-Tech Pumps

NCX Series of pumps from FPS, a brand of Franklin Electric

Submersible Pumps

FPS, A BRAND OF FRANKLIN ELECTRIC NCX SERIES

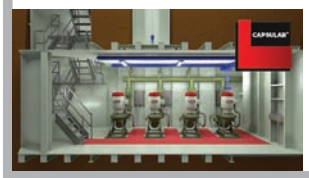
The NCX Series of explosion-proof submersible non-clog pumps from FPS, a brand of Franklin Electric, are certified for use in Class 1, Division 1 and Group C & D hazardous location requirements, making them suitable for a variety of applications such as lift stations, sewage systems, stormwater, flood and pollution control, industrial waste and dewatering, wastewater treatment plants, and general fluid transfer. They are available in single- and three-phase power options to accommodate flows up to 625 gpm. Each is designed for overall serviceability and reliability with durability-conscious features like a field adjustable wear plate, factory-standard dual silicon carbide mechanical seals and chemical-resistant components. Intrinsically safe non-clog control panels are also available for complete system integration. **866-271-2859; www.franklinengineered.com**

Vertical/Lift Station Pumps

INDUSTRIAL FLOW SOLUTIONS OVERWATCH

OverWatch pump system from Industrial Flow Solutions

Industrial Flow Solutions' OverWatch pump system lifts influent at the point of entry, eliminating the wet well. Effluent is contained, eliminating odors and reducing maintenance. The stainless steel body is designed to withstand the effects of corrosion from harsh materials and solutions, making OverWatch an ideal solution for the municipal, industrial and commercial industries. In addition, the system has HMI touchscreen controls to further simplify operations. **860-631-3618; www.flowsolutions.com**



CAPSULAR Underground Pump Station from Smith & Loveless

SMITH & LOVELESS CAPSULAR UNDERGROUND PUMP STATION

The CAPSULAR Underground Pump Station from Smith & Loveless provides an operator-friendly and economical solution for large-flow pumping up to 20,000 gpm. With a Safe-Stair entryway module and integrated HVAC, the pump station design meets the OSHA definition of "designed for continuous human occupancy" and therefore does not require classification as confined space entry. It comes with simplified-yet-powerful QUICKSMART Touchscreen Controls and a spacious interior offering a variety of user options including shelving, work desks, sinks and storage. The station is pre-engineered and fabricated, allowing for simple installation and future flow capacity increases via adaptation of additional pumps or larger rotating assemblies. **800-898-9122; www.smithandloveless.com**

Blowers

EURUS BLOWER ZZ SERIES

ZZ Series blowers from Eurus Blower

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. **630-221-8282; www.eurusblower.com**

e Series e11-MS blower from FPZ

FPZ E SERIES E11-MS

The e Series e11-MS blower from FPZ is a drop-in replacement for the K11-MS and offers increased efficiency, lower discharge temperatures and a significant reduction in perceived noise. The impeller design was developed through sound quality studies and rapid prototyping. The resulting design has a targeted reduction of the most displeasing frequencies. It is mountable in any position and offers a maintenance-free operation. Options include anodized aluminum components for corrosion resistance and increased sealing. **262-268-0180; www.fpzusa.com**

HOWDEN 827 DVJ

827 DVJ blower from Howden

The 827 DVJ dry-vacuum blower from Howden is a heavy-duty unit with integral ductile iron impellers. The casing headplates, gear cover and drive-end are gray iron. Carburized and ground spur timing gears are taper-mounted on the shaft and secured with a locknut, cylindrical roller bearings, splash lubrication on both ends and easy-to-read sight glasses for maintenance. The blower is capable of handling high inlet temperatures for rough applications. An efficient discharge jet plenum design allows cool atmospheric air to flow into the cylinder, so the blower continues to run under blank-off conditions. It comes in a compact, lightweight package and delivers more than 5,700 cfm in an 8-inch gear diameter frame, as well as 28 inches Hg. **800-557-6687; www.howdenroots.com**

SWAM Pneumatics blowers, distributed by JFH Distributing

JFH DISTRIBUTING SWAM PNEUMATICS BLOWERS

SWAM Pneumatics blowers, distributed by JFH Distributing, have large bearings (SKF or FAG-Schaeffler) and large shaft diameters for longer life in rugged applications, with reduced maintenance. They promise suitable volumetric efficiency at high speed and pressure. Drop-in replacement blowers are available for Robuschi, Hibon, Roots and other brands. Horizontal flow (or vertical flow) blowers are available up to 6,600 cfm and vacuum up to 28 inches Hg. Blowers can be made with either mechanical seals or labyrinth/piston-ring seals. **303-279-7797; www.swam-usa.com**

(continued)

KAESER COMPRESSORS RENTAL ROTARY SCREW BLOWERS

Rental Rotary Screw Blowers from Kaeser Compressors

Rental Rotary Screw Blowers from Kaeser Compressors helps avoid downtime and maintain operations, helping operators evaluate flow requirements prior to equipment purchase. Whether you need to service a unit without compromising operations, meet a temporary surge, or try new technology without spending capital, portable blowers from Kaeser are available in three sizes with oil-free flows from 200 to 2,309 cfm. They are extremely efficient and provide flexibility for low pressure applications. All units feature a full enclosure with soundproofing, protection from rain and snow and auxiliary heaters, making them suitable for outdoor installations in temperatures from 5 to 115 degrees F. Each model has multiple control modes, including pressure regulation, flow control (via panel-mounted potentiometer), and fixed speed. They are easily integrated into existing plant controls. Plus, if a new equipment purchase is the ultimate goal, the Sigma Control 2 will record and store air demand and power usage to help size the permanent blower and calculate ROI. **877-417-3527; www.us.kaeser.com**

Pump Controls

CLEARWATER CONTROLS, IS AN INDUSTRIAL FLOW SOLUTIONS BRAND DERAGGER+

DERAGGER+ from Clearwater Controls, is an Industrial Flow Solutions brand

DERAGGER+ from Clearwater Controls, is an Industrial Flow Solutions brand, eliminates blockages caused by rags. This intelligent deragging control system and network monitoring technology uses real-time pump data to prevent clogs before they happen, improving electrical efficiency by up to 48%. The system not only eliminates ragging, but also the costs associated with maintenance, downtime and cleaning. By monitoring a motor's power signature, its smart technology detects when a rag becomes a potential clog and modifies the pump's behavior to pass the rag. The benefit of passing a rag, rather than grinding it, is that the rag is then caught whole by the screens at the treatment works. With a grinder, minute particles can be passed through the screens, which can then aggregate to form further blockages or escape back into the waterways as a pollutant. **360-215-7676; www.deragger.com**

LUTZ-JESCO AMERICA TOPAX MC

TOPAX MC controller from Lutz-JESCO America

The TOPAX MC multichannel controller from Lutz-JESCO America has a modular design that makes it an adaptable and effective solution for all measurement and control technology requirements. It offers automated efficiency — freedom from repetitive control tasks while providing accuracy and reliability. Users can actuate the dosing pumps using an optocoupler or relay and servomotors by using a relay or a 20mA output. The high-resolution, 5-inch color display offers a user-friendly operating interface with a simple touch-control and intuitive navigation menu that can be set to multiple languages. Use four analog outputs (0/4-20 mA) or the network capability to transfer measured values to a web browser or a telemaintenance point. A programmable interval timer can be used to set automatic alerts for wear-related sensor change. **800-554-2762; www.lutzjescoamerica.com**

ORENCO CONTROLS OLS CONTROL PANELS

OLS Control Panels from Orenco Controls

OLS Control Panels from Orenco Controls come with the choice of either integrated starters or variable-frequency drives that optimize system operation. These panels are suitable for a variety of pumping applications, such as lift stations, stormwater pump stations, water boosting, dewatering or sludge pumping. They can also be used as a SCADA patch, connecting peripheral equipment to future or existing SCADA systems. Parameters can be configured via a human-machine interface and include a user-friendly startup wizard. Engineers can preprogram user interfaces to the site-specific needs of an installation, making the panel virtually plug-and-play. Maintenance staff can easily adjust settings and monitor the system remotely. These weatherproof control panels are UL 508A listed and include service-rated circuit protection, phase and voltage protection, and level controls. **877-257-8712; www.orenco.com**

PC-3000XC controller from PRIMEX

PRIMEX PC-3000XC

The PC-3000XC controller from PRIMEX is designed to operate up to three pumps in pump-up or pump-down applications. The controller's sequence pumps ON and OFF in response to a change in level input. The easy-to-read blue OLED display shows the operating status, featuring fast and intuitive menu navigation and setup. It provides for advanced communication functionality for integration to open architecture telemetry/SCADA systems. The easily configurable front panel means no programming software is required. It is only available as part of a PRIMEX custom-engineered control panel. **844-477-4639; www.primexcontrols.com**

Pump Parts/Supplies/Service

GORMAN-RUPP ECHOSTORM

EchoStorm static venturi aeration device from Gorman-Rupp

The EchoStorm static venturi aeration device from Gorman-Rupp is designed to add dissolved oxygen into liquids as they are being pumped. It adds oxygen to wastewater, reduces the size of organic solids and degasses organic solids. It is available in 2-, 3-, 4- and 6-inch sizes. Depending on the pump it is paired with, it can provide flows from 50 to 1,300 gpm with up to 857 pounds of dissolved oxygen per day. It is suitable for aeration in a variety of municipal, industrial and agricultural applications, including wet well influent, aerobic sludge digestion, lagoons, oxidation ditches, fat, oil and grease digestion, landfill leachate and mine water treatment, according to the maker. The device can be combined with Super T Series, Ultra V Series, Super U Series, 80 Series, 10 Series and 6500 Series pumps. **419-755-1011; www.grpumps.com**

PATTERSON DAVIT CRANE

Davit Cranes from Patterson

Patterson davit cranes are manufactured with a low maintenance, easy-to-assemble design. They are available in 1/2- and 1-ton capacities with key features such as a reliable brake with long life and readily available parts, a hot-dipped galvanized finish and no plastic sheaves or pulleys. **800-322-2018; www.pattersonmfg.com**

RELINER/DURAN LIFT STATION INSIDE DROPS

Lift Station Inside Drop from RELINER/Duran

By using controlled inside drops in lift stations, pump life can be extended by preventing aerated influent from being directly drawn into the pumps. By employing a RELINER/Duran Lift Station Inside Drop, dramatic reductions in pump related problems can occur, as well as reduced general maintenance and odor complaints. The drop pipe should be extended below the low limit level and cut to follow the slope of the base fillet. If there is no fillet, cut the pipe at 45 degrees, one pipe diameter from the floor or fillet. This will create a diffuser by directing the flow back against the structure, thus de-aerating the influent. Do not direct the incoming flow toward the pumps. This simple arrangement is superior to using elbow fittings and is easier to maintain as there is nothing to collect debris. It can be cleaned from above. **800-508-6001; www.reliner.com**

XYLEM RENTAL SOLUTIONS, A XYLEM BRAND, FLYGT 4220

Flygt 4220 mixer from Xylem Rental Solutions, a Xylem brand

The Flygt 4220 compact adaptive mixer from Xylem Rental Solutions, a Xylem brand, can help avoid unplanned downtime and enable continuous operation of critical plant processes despite maintenance requirements of permanently installed mixing equipment. It enables water utilities to seamlessly manage the changing mixing conditions in wastewater treatment application by adjusting the mixer output to meet operational demands. With enhanced capabilities, including full automation, mixers bring complete control and adaptability into the mixing process, in turn providing significant energy savings, imposed process resiliency, increased uptime and reduced inventory. The mixer's compact design makes it easy to transport and install. Additionally, its adaptive mixing technology is suitable for a broad range of applications, including municipal wastewater treatment plants, water utilities and industrial — versatile to fit the specific mixing needs of any operation and ideal for retrofits. **www.info.xyleminc.com** tpo

By Craig Mandli

Blower replacement helps plant become more efficient

Problem

A wastewater treatment facility in the Pacific Northwest had issues with an air-bearing blower. To prevent frequent starts/stops on a sequencing batch reactor, the staff left the blower running continuously and wasting energy. The plant needed a system both reliable in a start/stop environment and energy efficient.

Solution

The plant switched to **Inovair's IM-30 Geared Centrifugal Blower** (stacked option). It is efficient and designed to withstand multiple start/stops without limitation, while maintaining high shaft stability over its complete operating range. This application used unlimited-life, non-contact floating ring oil-film journal bearings and tapered-land thrust bearings in the gear box. That type of bearings has been used for decades in turbo-machinery; they operate on the same principles as the crankshaft bearings in most cars.

RESULT:

After thousands of starts/stops, the blower has worked flawlessly with no unexpected maintenance or downtime. In addition to energy savings, the maintenance reduced schedule reduced operating costs significantly. Local service with quick turnaround gave plant personnel with peace of mind. **855-466-8247; www.inovair.com**

Screw pumps stand up to decades of abuse

Problem

The Calhoun (Georgia) Wastewater Treatment Plant in 1988 installed two Lakeside Equipment 60-inch, 75 hp open screw pumps and two 72-inch, 50 hp screw pumps. Due to population growth, the plant needed more treatment capacity.

Solution

Original concrete construction left an empty space for a third pump in each capacity. The space was filled in 2012 by a new 60-inch, 75 hp **Lakeside Equipment screw pump.** A year later one of the original 60-inch pumps was replaced; the other 60-inch pump was replaced the following year.

RESULT:

John Banks, plant manager, observed, "The pumps were only beginning to wear out, but they were certainly not on their last legs. The original 60-inch pumps far exceeded their life expectancy and required very little maintenance. Once per week we check oil levels, and our operators also monitor the grease levels on the bottom bearing. All very simple, and with Lakeside's stainless steel tubing, we don't have to worry about corrosion. These routine checks have seen our screw pumps work very reliably for 25 years plus." **630-837-5640; www.lakeside-equipment.com**

Plant selects a flexible solution for lift station pump controller upgrades

Problem

A New Jersey wastewater treatment plant needed to replace outdated or obsolete pump control systems to ensure critical infrastructure resilience. A replacement controller would be easy to install and commission, flexible for a variety of pump system requirements, and future-proof, allowing the integration of new functions and capabilities as needed.

Solution

The staff chose a **PLCnext Pump Controller** from **Phoenix Contact** as a "configuration-only," prepackaged solution for controlling and monitoring up to four pumps while requiring no programming. The pre-designed configuration and operator screens are embedded in the controller and accessed via any HTML5-compatible device. The application runs on PLCnext Technology, an open control platform with new control system functionality needed to maximize efficiency and meet increased regulatory requirements.

RESULT:

The utility solution was easy to implement, flexible, and capable of meeting future needs for availability and reliability of critical water systems. **800-888-7388; www.phoenixcontact.com**

Dewatering improvements needed at expanding plant

Problem

The Sioux City (Iowa) Wastewater Treatment Plant (29 mgd average) had a solids treatment process installed in 2006 consisting of belt filter presses feeding a Schwing Bioset KSP-25 piston pump. The dewatered solids are pumped to a truck-loading sliding frame silo. As flow increased, more dewatering and pumping capacity became necessary.

Solution

A capital improvement project converted dewatering from belt presses to centrifuges; the process improvements required a technology able handle higher flow and drier cake solids. The plant selected a **KSP-45 cake pump** from **Schwing Bioset,** a technology familiar to the plant team, able to handle the increased flow, and reliable.

RESULT:

The pump significantly increased cake pump capacity while handling the higher-solids cake. The second cake pump gave the system full redundancy plus capacity for the future. **715-247-3433; www.schwingbioset.com**

Bearing system keeps conveyor in operation long term

Problem

A wastewater treatment plant in Florida was replacing conveyor screw ball-bearings much more rapidly than the OEM scheduled service interval, at great expense in downtime and maintenance labor. The conveyor uses a 4-inch shaft that drives the conveyor screw. Sludge would penetrate the pressurized grease-sealed ball-bearing cases and accelerate the wear, eventually resulting in a complete failure approximately nine months from the last rebuild.

Solution

SealRyt designed a **PackRyt bearing** from their own SR01081 material, along with a reconfigured housing that utilized a pressurized air flush system. The PackRyt BLR (bearing with integrated lantern ring) is designed with close clearances to eliminate shaft movement, allowing it to seal effectively. Once the shaft has been stabilized, the air flush system creates a pressure differential that keeps sludge from entering between the BLR bearing and sleeve - eliminating excessive wear. The design also eliminates any internal moving parts.

RESULT:

The PackRyt BLR was installed over nine years ago (in September 2012) and continues to run today without replacement or adjustment. **413-564-5202; www.sealryt.com**

Wastewater treatment solution for a critical airport application

Problem

To avoid the delay or cancellation of hundreds of flights, a European airport invested in de-icing cannons to spray airliners with heated glycol. The airport was concerned that wastewater from the process could contaminate waterways and harm wildlife. With up to 264 gallons of deicer required to clear an Airbus A380, and hundreds of flights departing daily, the pollution risk was significant.

Solution

Water-treatment dosing and control specialist **SEKO** supplied an automated **polymer batching system** to separate pollutants and allow treated water to be safely discharged to a nearby watercourse. The PolyCendos polymer preparation unit automatically doses up to 53 gallons of wastewater per second with flocculant. The all-in-one system includes an IP65-rated electric control panel, dosing pumps and powder feeder. It has three chambers for dissolving, maturing and storage, interconnected by syphons, enabling formation of a high-quality solution. The chambers include inspection covers and emptying valves and are made entirely in PPH for chemical resistance and a low-friction surface.

RESULT:

With the system in place, airport management can guarantee the quality of its discharged water and protect wildlife while enhancing its drive for sustainable growth. **215-945-0125; www.seko.com/us** tpo

worth noting

people/awards

The Clayton County (Georgia) Water Authority earned two awards from the Georgia Association of Water Professionals:

- The **W.B. Casey Water Resource Recovery Facility** Central Wastewater Lab in Jonesboro earned its second Laboratory QA/QC Gold Award.
- The **Northeast Water Reclamation Facility** in Rex earned the George W. Burke Safety Award.

Cathy Green, Orange County Water District director was elected vice president of the Association of California Water Agencies.

The **Holmes Harbor Sewer District** in Freeland, Washington, received a 2020 Wastewater Treatment Plant Outstanding Performance Award from the Department of Ecology.

The **Plainview Water District** received the Gold Engineering Excellence Award from the American Council of Engineering Companies New York for advanced oxidation process pilot studies with H2M architects + engineers.

The Illinois American Water **Peoria Water Treatment Plant** and its water quality team earned the Directors Award from the Partnership for Safe Water for maintaining Phase III certification for 20 years.

California Water Service Group promoted Sophie M. James to chief water quality officer, a new officer-level position.

Chad Roberts, water treatment plant supervisor with the Norfolk Water Division, received the George Warren Fuller Award from the Nebraska Section AWWA. The **Norfolk Water Division** also received the 2021 Safety Award.

The **Columbus (Nebraska) Wastewater Treatment Facility** received a Gold Award and the Scott Wilber Award for the most outstanding facility from the Nebraska Water Environment Association.

Michael Ficarella was named superintendent of water and wastewater for the City of Batavia, New York.

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events

March 9
AWWA Fire Flow Testing and Assessing Distribution System Health webinar. Visit www.awwa.org.

March 21-24
WEF Public Health and Water Conference & Wastewater Disease Surveillance Summit, Duke Energy Convention Center, Cincinnati. Visit www.wef.org.

March 23
AWWA Using AMI Data in Hydraulic Modeling webinar. Visit www.awwa.org.

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