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AUGUST 2016

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Utilities Superintendent
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Moving Up **to Membranes**

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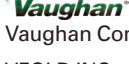





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on the cover

Led by Jeff Reeves, utilities superintendent, operators at the Sterling (Colorado) Water Treatment Plant went from on-site well water chlorination to a \$30 million, 9.5 mgd reverse osmosis (RO) plant to address high levels of naturally occurring uranium in the source water. It has been a quick and successful transition. (Photography by Carl Scofield)

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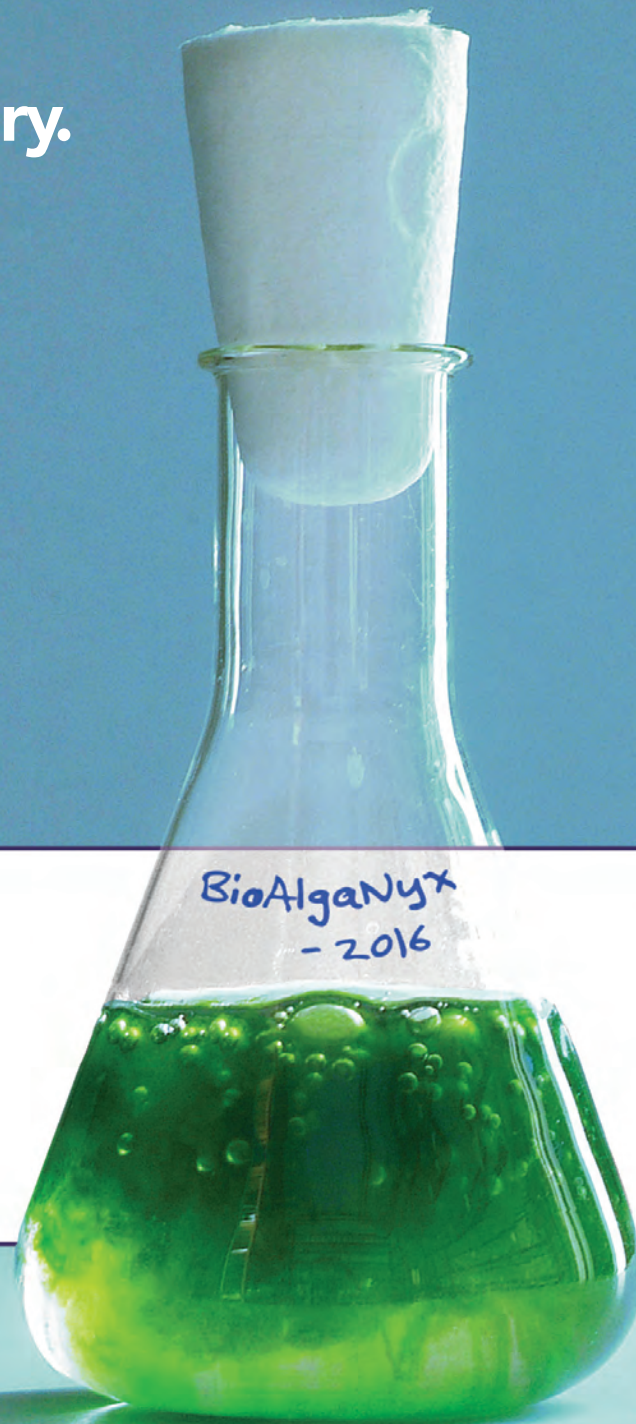
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let's be clear

Have You Talked to a Kid Lately?

CRISES AND PROBLEMS INVOLVING WATER AND WASTEWATER HAVE BEEN IN THE NEWS REGULARLY. IS NOW THE TIME TO ENGAGE A BRIGHT YOUNG PERSON TO CONSIDER ENTERING A WATER PROFESSION?

By Ted J. Rulseh, Editor

It's said that one of a leader's most important duties is to groom a successor. That's important in the water professions, where a wave of retirements is coming, and soon.

Are you near retirement? If so, even if you're not a leader by job title, would you like to help leave a legacy in the form of a bright young recruit to the industry? Well then, maybe now is a good time to give it a try.

Why now? Because the stars and planets seem aligned in ways that make it easier than usual to connect with young people about the importance and rewards of water careers.



CRISIS MEANS OPPORTUNITY

Check the newspaper. There have been stories about lead contamination in drinking water, first in Flint, Michigan, and later in other cities around the country. There are stories

about plastic microbeads in wastewater. Pharmaceuticals and other micropollutants in wastewater. Nitrogen and phosphorus pollution. Dead zones in water bodies.

Young people are concerned about the environment. You're well qualified to explain to them how you have made a difference, and how they can, too. The topic is incredibly timely.

What else is working in your favor? The specter of college debt. Increasingly, young people wonder: Is a college degree by definition worth the money invested? The answer isn't as clear-cut as it was years ago.

No one wants to discourage a bright young person from going to college if that's what he or she wants. But some high school students are interested in alternatives that can still lead to good careers and prosperous futures. They might like to know that the water industry offers such careers and that the price of admission need not include a four-year degree.

They can get the training and education they need on the job through apprenticeship or at a community college. Either way, they can start their careers essentially debt-free. Once in the profession, opportunities to advance are substantial. Pay is competitive. More schooling is always an option. The jobs can't be outsourced. Best of all, the work is challenging and without question serves a vital purpose.

COMPELLING CASE

Working in water may not be as (supposedly) glamorous as writing software code or building e-commerce websites or developing smartphone apps, or any number of other professions. But there's a strong case to be made for it. Making that case requires a personal touch. You're just the kind of person to deliver it.

I've been around the industry long enough to know how committed and passionate water professionals are. Commitment and passion win converts. So many great people I meet in the industry never planned to be water or wastewater operators, but fell in love with the career once they entered it. Such professionals are in a perfect position to use what's called the "feel, felt, found" argument in talking with young people.

For example, a young person might say, "I just don't find that career very appealing." To which the operator can respond, "You know, I can understand why you *feel* that way. I *felt* that way myself years ago. But when I got into the profession, here's what I *found* ..."

How can you get opportunities to talk up your career to young people? The ways are limited only by your imagination.

MAKING THE CONNECTIONS

How can you get opportunities to talk up your career to young people? The ways are limited only by your imagination. Some obvious ones include staffing exhibits, fairs and festivals; guiding plant tours; and talking to middle school or high school classes on career days.

Some less obvious ones, which maybe take a bit more courage, include taking your son or daughter and some of their good friends on a visit to your plant. Or going on a radio program to talk about your plant's achievements (and slipping in commentary about the rewards of water careers).

Or maybe volunteer as a Boy Scout or Girl Scout merit badge counselor for an area like sustainability, chemistry, environmental science or public health. Talk about a chance to engage personally with kids who have potential for water career interest.

Whichever approach you may choose, never underestimate the impact your enthusiasm for your work can have on young ears and young minds.

So how about it? If every operator, before retirement, took on the challenge of getting one young person to at least explore the possibilities of working in water, perhaps there would be a line at the figurative water and wastewater employment office. And maybe that coming wave of retirements, in terms of its impact on the industry, would end up feeling more like a ripple. **tpo**



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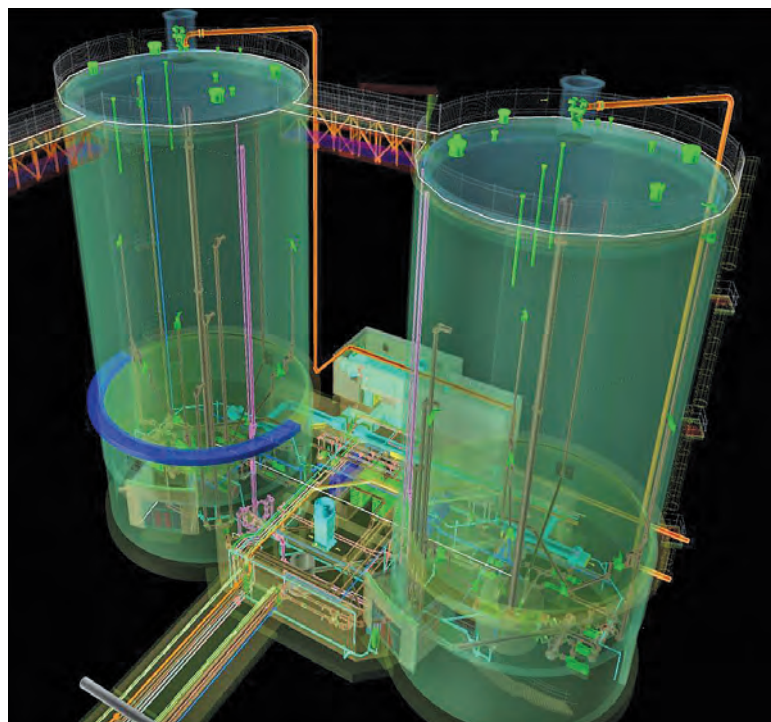
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TECHNOLOGY INVESTMENT

What is R2E2 Solids Handling?

It might sound like a Star Wars malapropism, but R2E2 is actually the name of the new wastewater recovery and reuse system under construction at NEW Water in Green Bay, Wisconsin. Find out how this \$169 million upgrade is expected to save the utility millions each year.

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IT'S GOLD, BABY!

Operations Superstars Win Big

An all-star operations team shares what it was like to compete at the Open German Championship in Wastewater Technology, held June 1-4. Turns out things aren't so different worldwide when it comes to wastewater. Find out how the challenge differed from its American counterpart, and see where the U.S. team excelled.

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Jeff Kalmes, 3 Positively Awesome Public Education ideas
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THAT DANGEROUS H₂S

It's More than a Rotten Egg Smell

"What is that rotten egg smell?" If you're a wastewater operator, you get that question a lot from plant visitors or maybe just from curious friends and family. However, H₂S is more than an offensive odor; it's a deadly gas that can be serious for wastewater and collections workers. Find out if you're taking the proper precautions.

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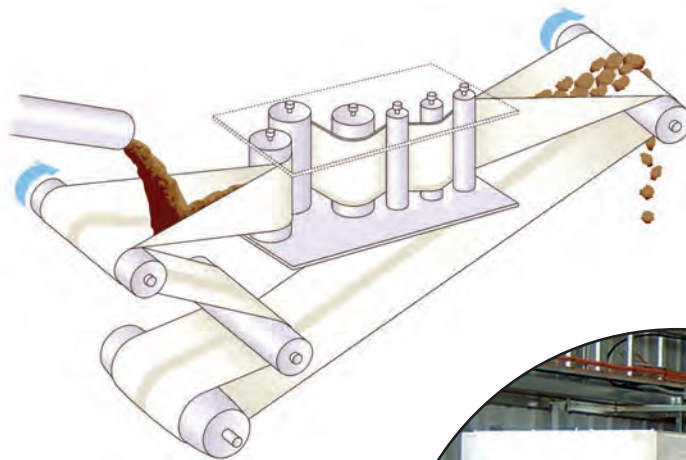
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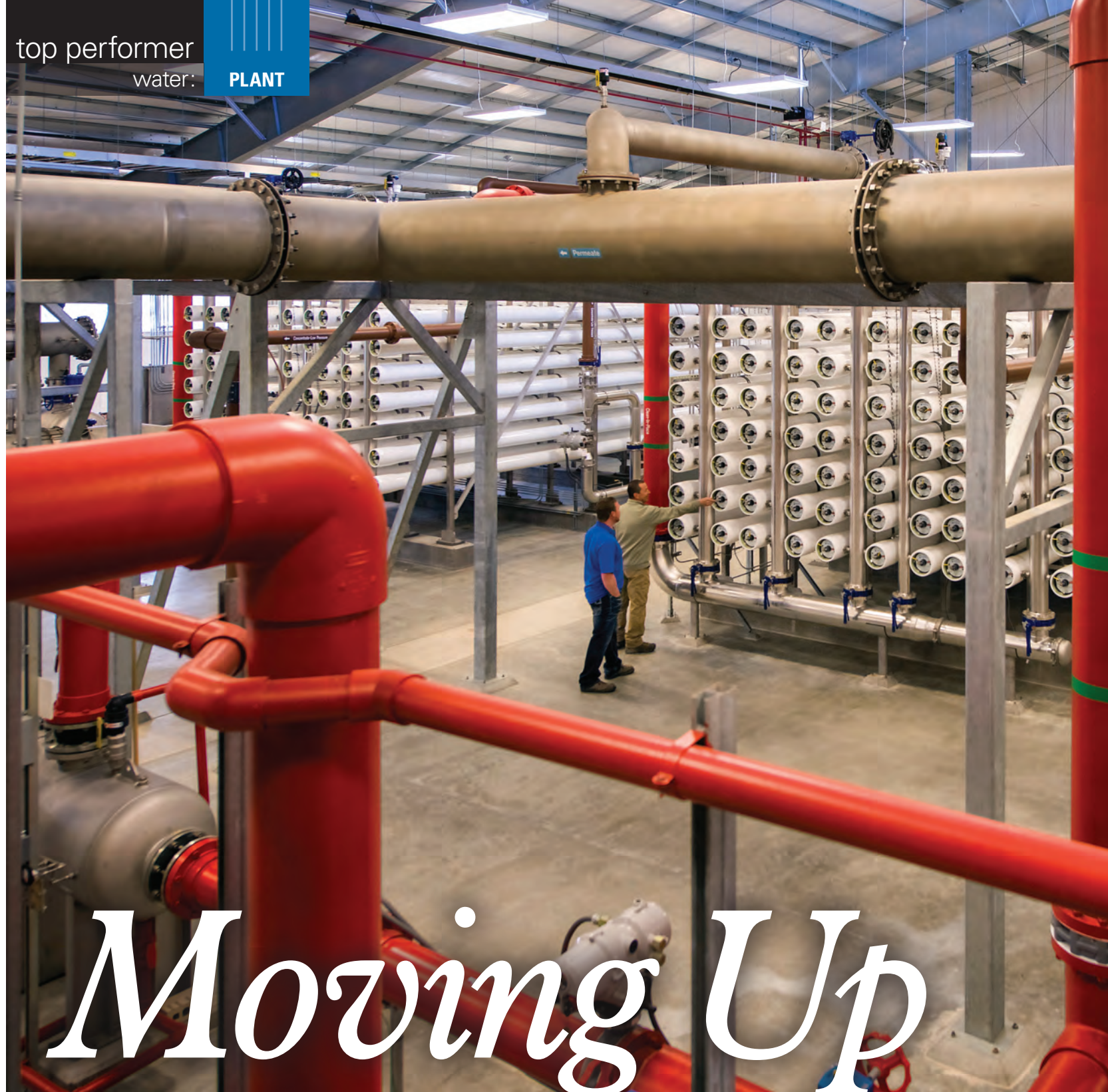


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Moving Up to Membranes

THE STERLING WATER TREATMENT PLANT TEAM MADE A QUICK AND CAPABLE ADJUSTMENT TO REVERSE OSMOSIS FOR URANIUM REMOVAL

STORY: **Trude Witham**
PHOTOGRAPHY: **Carl Scofield**



David Beck, left, lead operator, and Jeff Reeves, utilities superintendent, with the reverse osmosis membrane filter array, framed by red RO treated water pipes (H2O Innovation).

OPERATORS AT THE STERLING WATER TREATMENT Plant went from on-site well water chlorination to a \$30 million, 9.5 mgd reverse osmosis (RO) plant with deep injection wells for waste disposal. It has been an interesting experience.

“We were tasked with operating a very different facility than any of us were familiar with,” recalls David Beck, lead operator. “We had to learn new equipment and understand new processes well enough to not only operate, but to solve issues.”

The city began planning for the new plant in 2008, when the Colorado Department of Public Health and Environment issued an enforcement order to address naturally occurring high uranium in the drinking water.

The city hired Hatch Mott MacDonald (HMM) as project manager and design engineer for the facility, which became operational in November 2013. Deep injection Well No. 1 went online in October 2013, and Well No. 2 in March 2014. HMM received the 2015 Engineering Excellence Award for the project from the American Council of Engineering Companies (ACEC) of Colorado.

Today, the plant’s operators produce water that meets all standards and also tastes good — sweet success after many months of construction, training, commissioning and the ongoing challenges of running and maintaining a complex system. “To me, our greatest success is success,” says Beck. “Navigating through challenges while producing a product that exceeds regulatory standards is our greatest achievement.”

COMPLEX SOLUTION

Before the new plant was built, the city’s water treatment system consisted of 12 wells and five chlorine injection sites. In the distribution system, pressure was maintained by two elevated storage tanks and two ground storage tanks. A few operators from the distribution and collection crew handled the water treatment.

In September 2008, the Department of Public Health issued an enforcement order to the city to ensure long-term compliance with maximum contaminant levels for uranium (0.030 mg/L) and total trihalomethanes (0.080 mg/L).

“At this time, Sterling’s water system had an annual running average of 0.044 mg/L uranium and 0.083 mg/L total trihalomethanes,” says Beck. The raw water also contained high levels of sulfate (438 mg/L), total dissolved solids (1,177 mg/L) and hardness (376 mg/L). Many local homes and businesses used ion-exchange softeners and under-the-sink reverse osmosis systems to treat their water.

The city hired HMM to do a cost-benefit study on a treatment plant. The consultants recommended RO technology and two EPA Class 1 deep injection wells to dispose of the uranium-contaminated brine reject water. The 7,000-foot wells send the brine below an impermeable rock layer.

“Since the RO process filters out essential minerals, blending filtered water with RO-treated water ensures a balanced, noncorrosive product.”

DAVID BECK

Sterling Water Treatment Plant, Sterling, Colorado

BUILT: | 2013

POPULATION SERVED: | 14,000

SERVICE AREA: | City of Sterling

SOURCE WATER: | 2 wells on the South Platte River Alluvial

TREATMENT PROCESS: | Reverse osmosis

DAILY FLOWS: | 9.5 mgd design, 4.0 mgd average

DISTRIBUTION: | 95 miles of water mains

SYSTEM STORAGE: | 10 million gallons

KEY CHALLENGE: | Raw water quality changes

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ABOVE: The team at the Sterling Water Treatment Plant includes, from left, Theresa Haydel, operator; Jeff Reeves, utilities superintendent; David Beck, lead operator; and Nada Baker, operator. LEFT: Beck replaces the 5-micron double-gasket filters that process raw water before it reaches the RO membranes.



Normally used in the oil and gas industry, deep injection wells allow the brine to seep into natural rock formations. “In Sterling’s case, there is a water reservoir within these formations that had to be proven of worse water quality than the brine being injected before permitting could take place,” says Beck. Injection well permitting took a year, and plant construction took 20 months. It took an additional 10 months to build a pumping house for Well No. 2.

After entering the plant, 83 percent of the raw water is filtered in three filter chambers (Parker Hannifin). The water is treated with antiscalant and sent to the RO process. The remaining 17 percent is filtered and sent to the blend process (Graver Technologies filtration system).

“The blend process is credited with 3.5-log removal and is used to mix with permeate water from our three RO trains (H2O Innovation),” says Beck. “Since the RO process filters out essential minerals, blending filtered water with RO-treated water ensures a balanced, non-corrosive product.”

The trains operate at 82 percent recovery. The permeate is sent to a 17,000-gallon tank that feeds a mixing chamber, where operators add the blend water, sodium hypochlorite and sodium hydroxide. From there, the water enters a 300,000-gallon baffled clearwell, where it achieves the required chemical contact time. The RO concentrate (0.2 to 1.2 mgd) is sent to a concentrate storage tank before being pumped to the injection wells.

REACHING COMPLIANCE

The new plant took a year to reach compliance. “We were out of compliance until we had a full year of analysis below all MCLs,” says Beck. “So, although the plant was fully operational in November 2013, we had to operate for a full year under all MCLs before the enforcement order was lifted in December 2014. Today, the finished water quality is excellent, with 0.0049 mg/L uranium, 70 mg/L hardness, 77 mg/L sulfate, 280 mg/L TDS and 0.00243 mg/L TTHM.

System startup happened in stages. “Dave and I were the only ones involved during construction and initial startup, and we didn’t know much about the process,” says Jeff Reeves, utilities superintendent. “We had to learn everything very quickly.”

“Our facility is still relatively new, so when an issue does come up, it is likely something we haven’t faced before.”

DAVID BECK

Says Beck, “We got to see each piece of equipment being installed, and we learned about it as it went online.” Reeves and Beck came on board just before construction began, and they represented the city for all decisions after that. Two more operators were hired later in the commissioning stage; neither had water treatment experience.

H2O Innovation trained the team on the RO and clean-in-place systems. Manufacturers’ representatives trained them on everything else: chemical pumps, RO feed systems and pumps, finished water motors and pumps, filter chambers, inline analyzers, process water feed system, SCADA and HVAC systems.

“As each piece of equipment came online, the FactoryTalk SCADA program (Rockwell Automation) was updated to incorporate the new equipment,” says Beck. “I sat with AmWest Controls so I could learn the new controls and validate the alarms.”

REMOVING SCALE

A few weeks after RO system startup, a calcium carbonate scaling problem in the concentrate removal system halted operations. Chemical dispersants used in the RO process are designed to keep minerals in solution.

“We quickly found out that these dispersants were not designed to overcome the time the brine was in the storage tank,” says Beck. “No one foresaw this issue because deep injection is not common for RO facilities. The only other RO facility in Colorado with a deep injection well does not have a brine storage tank.”

HMM suggested an acid injection system to lower the concentrate pH and help keep the dissolved min-

erals in solution. Hydro Construction helped the operators pull pumps and investigate the issue. What they saw was alarming. “There were basically rock formations covering the pump screens, pipes and pump impellers, and there was no way to scrape it off,” Beck says.

Plant operators came up with the idea to soak the pumps in CLR (Jelmar). “It’s an off-the-shelf product for removing calcium, lime and rust,” says Beck. “We went around and bought all the product the local stores carried.” They capped the end of a 6-foot-long 10-inch pipe and inserted the entire pump and pipe assembly into that piece of pipe, then filled it with CLR. Within a few hours, the pump was good as new, so they did the same thing with the other three pumps.

Although they were back in business, the operators needed a long-term solution. “The acid injection system proposed by HMM was an option that would certainly work, but it had a couple of drawbacks,” says Beck. “At the



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VERSATILE TEAM

Operators at the Sterling Water Treatment Plant do it all. They clean and calibrate instruments, change RO pretreatment/blend system filters, and perform routine pump and motor maintenance. They spend substantial time collecting and analyzing data so they can monitor the health of the RO membranes, plan ahead for maintenance and investigate issues.

"Most Class A facilities have different departments to handle operation, equipment and instrument maintenance, laboratory testing and groundwork," says David Beck, lead operator. "We don't have separate departments for these, so our operators need to be well rounded. We try to make the maintenance routine, and based on manufacturers' recommendations, so we can stay on top of things before they become an issue."

The team works well together. "We all play our part," Beck says. "We're a small community, and it's hard to find employees with RO experience. Our operators had to learn on the job, and that took a lot of dedication."

Jeff Reeves, utilities superintendent, adds, "Since we couldn't find people with RO experience, we looked for those who were interested in water treatment and who had taken relevant courses like biology, and we trained them from the ground up."

Reeves has been with the city for 10 years and holds Class B Water Treatment, Class C Wastewater Treatment, Class 4 Distribution, Class 4 Collections Systems, and Class D Industrial Waste certifications. Beck reports to Reeves and has been with the city for eight years. He holds Class A Water Treatment, Class 4 Distribution and Class 3 Collections Systems certifications.

Reporting to him are operators:

- Nada Baker, Class A Water Treatment, Class 1 Distribution, Class 1 Collections Systems, Class D Industrial Waste
- Theresa Haydel, Class B Water Treatment, Class 1 Distribution
- Eli Krueger
- Justin Bartlett

New hires receive on-site training and offsite classroom instruction in water treatment. "We focus their training on what will help us out the most at the plant," says Reeves.

Theresa Haydel, left, and Nada Baker close the new 5-micron filters into the filter chamber.

feed rates required for hydrochloric acid, the operational costs were extremely high.

"The other acid available was sulfuric acid, which could cause potential issues with the deep wells. The brine is already near its saturation limit for sulfate, so using sulfuric acid could cause sulfate to come out of solution." This was an issue, since sulfate fouling of a deep injection well is not reversible. Antiscalant provider King Lee Technologies supplied a product that worked immediately.

OBJECTIVE APPROACH

According to Beck, the operators' greatest challenge is dealing with new issues that arise: "Our facility is still relatively new, so when an issue does come up, it is likely something we haven't faced before. And there aren't any references to an established solution. Each issue has to be approached objectively."

(continued)

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For example, the operators noticed inline pH values slightly different from expected levels based on dosages and known water quality. “The answer isn’t necessarily that the dose needs to be changed or the probe is bad,” says Beck. “It would have to be approached with an open mind to many possibilities. One question to ask would be: Is this value correct? If so, you would approach it from a quality control position. If the value is wrong you would start looking at the probe.”

It turned out the problem wasn’t the probe. The team discovered that the probe yielded different values when testing the same water in a beaker versus inline. In the beaker, it read the correct value. “In our case, there was stray current in the water, which threw off the probe by a couple of tenths,” says Beck. “Operation is pretty straightforward when everything is running as you expect. But with some issues, you really have to be creative to find the cause.”

MEETING CHALLENGES

Plant operators face ever-changing raw water quality. “We have to stay on our toes and continuously monitor membrane performance,” says Beck. “Since the treatment technique before we built the new plant was limited to chlorine injection, these raw water changes were never monitored, and we had very little previous data.”

Although the wells are relatively close to each other, their water quality is different. Operators see subtle changes in each well year-round in conductivity, hardness, alkalinity and organics.

Another concern is deep injection well failure. “No one will give me a definite answer on how long they will last, since every injection well is different and subject to unknown conditions in the reservoir they inject into,” says Reeves.

Besides the analysis and reporting on the wells, the plant must perform a yearly pressure falloff test, giving insight on how the reservoir is responding to injection. Every five years, the plant performs a mechanical integrity test to prove that the wells are mechanically sound. They also perform a

“Operation is pretty straightforward when everything is running as you expect. But with some issues, you really have to be creative to find the cause.”

DAVID BECK

radioactive tracer test to see where the injection fluid flows, making sure none is passing the rock barrier above the reservoir.

“If the injection wells fail because they reached their capacity, we have four other sites where we could drill more,” Reeves says. “If a well fails because of scaling or biological fouling, we will hire a company to rehab it.”

Beck adds, “We monitor and record data on the wells as we run them. We can’t monitor everything going on in the injection zones, but by monitoring pressure and flow changes, we should be able to catch any fouling in time to schedule a remedy.”

Despite these unknowns, Beck is confident that the team will do its best to meet current and future challenges while producing safe, high-quality water. **tpo**

Laboratory tests are part of regular duties for Theresa Haydel.



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Boosting Biogas

A CALIFORNIA TREATMENT PLANT JOINS A US DEPARTMENT OF ENERGY PROGRAM, EXPANDS ITS COGENERATION SYSTEM AND MAKES PROGRESS TOWARD NET ZERO ENERGY

By Doug Day

The Victor Valley Wastewater Reclamation Authority saves about \$40,000 per month by using biogas to displace some natural gas for generating electricity.

With a biogas cogeneration system that went online in September, the plant now produces 93 percent of its power. “We’re nearing a goal where we can say we are energy neutral,” says Logan Olds, general manager.

Victor Valley was the first wastewater treatment plant to join the U.S. Department of Energy Better Buildings, Better Plants program in December 2014. Many more plants have since joined the program, which has 160 members representing more than 2,400 industrial facilities.

Those in the program pledge to reduce energy use by 25 percent over 10 years and share their solutions to help others. “We are trained to meet water-quality regulatory requirements,” notes Olds. “We are not trained on electrical production and energy efficiency. Better Buildings, Better Plants helps educate me and the staff about how we monitor, track and project our energy efficiencies and savings. It’s helping us develop the same programmatic approach for energy that we have for water quality.”

“Better Buildings, Better Plants helps educate me and the staff about how we monitor, track and project our energy efficiencies and savings. It’s helping us develop the same programmatic approach for energy that we have for water quality.”

LOGAN OLDS

OPPORTUNITY KNOCKS

The opportunity came when Anaergia, looking to demonstrate technology it has used for years overseas, applied for a grant from the California Energy Commission to install its Omnivore anaerobic digestion system at a wastewater treatment plant in the state. The company had 1,600 Omnivore installations worldwide but none in North America.

The commission provided a \$2 million grant for the Omnivore project, and Anaergia contributed \$600,000. The company used the money to retrofit a decommissioned VVWRA anaerobic digester for its process, which triples biogas production. The authority had saved three old digesters instead of tearing them out when two larger digesters were built in 2008.



The Victor Valley Wastewater Reclamation Authority has two 800 kW engine-generators (2G Energy) fueled with biogas produced by the Omnivore anaerobic digestion system (Anaergia).

VVWRA entered a 20-year power purchase agreement with Anaergia for the biogas-to-energy project. “Anaergia provided the equipment, retrofitted the tanks and installed the mixing technology,” says Olds.

The Omnivore process thickens and mixes solids to increase biogas production. “I’ve always been told you can’t reliably mix more than 2.5 percent solids in anaerobic digesters,” says Olds. “We are mixing 6 percent day in and day out. They’ve also demonstrated the decoupling of the hydraulic and solids retention time. So the water goes away, but the solids remain in the digester so we can generate additional gas.”

LOOKING TO EXPORT

The biogas is stored in a double-membrane gas holder installed by Anaergia and is burned in a pair of 800 kW engine-generators (2G Energy).

One improvement being considered is battery-based energy storage. “One issue with power production is that you have varying loads and the generators can’t always ramp up fast enough, or you get frequency variations in the voltage,” says Olds. “With a battery system and a microgrid controller, we can handle those variable loads. Once we demonstrate that ability, we could export up to 400 kW to the utility grid.” Olds will pursue a grant from the Energy Commission for that project.

The ability to export power would make it possible to co-digest FOG and food processing waste and produce more fuel, export more power and gen-

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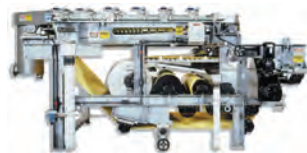
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Just under 5,000 cubic feet of gas storage is provided by a low-pressure soft-sided tank.

erate revenue. “We still have two digesters offline, so I’d like to find a private partner to find a use for them and provide some benefit to our facility,” Olds says.

LEARNING FROM OTHERS

VVWRA serves about 300,000 people across 216 square miles in the Mojave Desert. Its activated sludge plant (18 mgd design, 12.3 mgd average) uses biological nutrient removal, AquaDiamond cloth-media tertiary filters (Aqua-Aerobic Systems) and UV disinfection.

“It’s kind of unusual,” says Olds. “We are required to release a little more than 8 mgd for reuse by downstream communities and for habitat maintenance in the Mojave River. The remainder is used in a local power plant’s cooling towers or sent to percolation ponds and eventually goes back to the aquifer.”



A formerly decommissioned anaerobic digester was retrofitted and equipped with an Omnivore recuperative thickener that triples gas production.

As a member of the DOE program, Olds hopes to learn from industries that have been treating water for other uses and with less energy intensity. “If you look at other places where water is scarce, our industrial partners have already done some of this work on the pretreatment side for creating potable water for their product,” he says. “Some of the big ones are bottled water and soda. We need to do the same in cleaning up the water before releasing it to the environment.”

The authority is now building two 1 mgd regional plants that will reclaim some wastewater for irrigating landscapes and golf courses and send the remaining wastewater and the solids to the main plant for further treatment. They are to be operational in mid-2017. Olds is also considering solar energy to help meet those plants’ energy needs. **tpo**

A LOVE FOR LEARNING

EDUCATION AND TRAINING GUIDE AWARD-WINNING SUPERINTENDENT ED BONHAM
AS HE LEADS THE WATER AND WASTEWATER TEAM IN NEWTON, KANSAS

STORY: **Jim Force**
PHOTOGRAPHY: **Ed Zurga**

ED BONHAM BASKS IN PEACE AND calm as he cruises the county roads of Kansas on his 2010 Harley-Davidson Street Glide motorcycle, wind at his back.

But you can be sure he's thinking about his job as superintendent of water and wastewater for the City of Newton, Kansas, and especially about his operators. "They inspire me," says Bonham, 2015 winner of the William D. Hatfield Award from the Kansas Water Environment Association (KWEA). "When they're out there at 3 in the morning in 25-degree weather repairing a main break, I realize they care as much as I care. They've pushed me up the ladder. I wouldn't be in this position without them."

EARLY INSPIRATION

A high school shadowing program helped Bonham discover opportunity in water management, and surely is the reason he values education as much as he does today. "I was 18, with little interest in college and no interest at all in working at 7-Eleven the rest of my life," he says.

His high school in McPherson, Kansas, offered tours of local businesses and organizations, and he chose to visit with the Public Works director, who he thought wouldn't be doing too much. "He was also a friend of the family," he says.

When he saw the scope of the work the director was responsible for, he was hooked. "I loved biology and working with my hands," he remembers. "I started devouring everything I could find about getting into this field and talking to people in the industry." After graduation, he was hired at the wastewater treatment plant he toured as an operator trainee.



Ed Bonham

That was 16 years ago; later he joined the design team at the wastewater plant in Rose Hill, Kansas, and became the town's Public Works superintendent. Then he joined the Newton staff because it was a bigger challenge and closer to home.

Today, he supervises the Newton Water Division and wastewater collection and treatment; he also oversees the public wholesale water district. He and a team of 27 employees provide potable water to Newton's 20,000 residents, and collect and treat 2 mgd of wastewater, discharged to Slate Creek. The treatment process is being upgraded to include biological nutrient removal and UV disinfection.

REWARDING DEGREES

While he didn't plan on college as a teenager, Bonham went back to school during his working career, studying nights at Friends University to earn a bachelor's degree in organizational management and a master's degree in environmental science. At the time, he and wife Valerie were raising two children while working full time. "It was tough, but it was something I wanted to do for me," Bonham says.

The hard work has paid off. Bonham says the college program improved his ability to manage people. He had some experience leading a team as a shift manager at a restaurant during high school.

"But the degree taught me to understand people — what I was doing that was right and what that wasn't. Understanding people is an art."

The master's degree taught him how to better comprehend research: "I wanted to learn more about the environmental side of things — biology and the science of discharging clean, safe water." Having invested so much time



“I’m a huge advocate of education. In our field, I always encourage education, education, education. This is not a job. It’s a lifelong career.”

ED BONHAM



ABOVE: Justin Vajnar, right, utility supervisor, updates Ed Bonham on the progress of new construction on the plant site. LEFT: The plant operations team includes, from left, Justin Vajnar, utility supervisor; Nathan Phillips, maintenance worker; Bonham; and David Leiser, wastewater operator.

Ed Bonham, Newton (Kansas) Water and Wastewater Division

POSITION: | **Superintendent**

EXPERIENCE: | **16 years**

RESPONSIBILITIES: | **City water and wastewater systems, public wholesale water district**

EDUCATION: | **Bachelor’s degree in organizational management, master’s in environmental science, Friends University, Wichita**

CERTIFICATIONS: | **Class 4 water, Class 4 wastewater, Class 1 lab analysis**

GOALS: | **Successfully replace retiring workers; continue improvements in training and education**

GPS COORDINATES: | **Latitude: 38° 2’53.98”N; longitude: 97°20’33.74”W**





Ed Bonham has earned a reputation as a strong leader who also respects and listens to the people on his team.

WELL RESPECTED

When you talk with those around him, it's easy to see why Ed Bonham won the Kansas Water Environment Association's William D. Hatfield Award.

"He's a good leader, that's for sure," says Justin Vajnar, utility supervisor for water and wastewater at Newton, Kansas. "I've worked with him since he started here in 2010. It's been a good experience. Whenever I have a question, he's always ready to help. We can have a debate about something. He's not an iron-fisted type of individual."

Bonham's leadership skills also impress Suzanne Loomis, city engineer and Public Works director: "He's a super guy and great leader of his staff. He leads by example and never asks his staff to do something he wouldn't do. He's always looking for ways to improve the organization, and he gets results."

Loomis notes that Bonham and the wastewater plant are in the middle of an expansion project, and the staff is being asked to work through the construction chaos. "Ed is out there on site, making sure we end up with a quality product," she says. "I can't say enough about him."

“In three to five years, a number of our key people will be eligible for retirement. They'll take a lot of institutional knowledge with them. When they're gone, they're gone.”

ED BONHAM

in his own education, it's not hard to see why Bonham is completely invested in the education and training of his staff.

"I'm a huge advocate of education," he says. "In our field, I always encourage education, education, education. This is not a job. It's a lifelong career. There's something different every day. The way to learn and gain advanced understanding is through education."

TRAINING INNOVATION

He has helped develop training programs for the KWEA and Kansas Municipal Utilities. And he's not satisfied with status-quo training programs. "People get tired of the same old thing, year after year, just coming in to earn credit for hours," he says.

He's part of a group that's pushing for different approaches, like teaching long-term wastewater courses, having online meetings to help with homework questions, and having meetings at plants to help operators understand different options: "No two plants are the same. I like to use technology as much as possible to help attract and recruit the next genera-



An aeration basin at the Newton treatment facility.

tion of operators.” He puts his money where his mouth is: “When I came here, only four people had certification. Now, 26 are certified and the only who isn’t has been with us for six months.”

Training of newcomers and the younger staff members is critical as Bonham and Newton face a familiar prospect: retirement of the veterans on the team who will carry an abundance of know-how out the door. “Succession planning is probably my biggest challenge,” Bonham says. “In three to five years, a number of our key people will be eligible for retirement. They’ll take a lot of institutional knowledge with them. When they’re gone, they’re gone.”

While Bonham doesn’t have an organized program to capture those veterans’ experience, he does keep a notebook and fills it with information he gleans from them. “We also pair newcomers with veterans so they learn from the more experienced staff members. Our challenge is to grow people in the organization to step up and take on new positions.”

BIGGER CHALLENGES

As he trains new staff, Bonham shouldn’t have any trouble motivating them about the importance of their work. Harking back to his high school interest in biology and mechanics, he talks about the challenges the clean-water profession faces today: “Infrastructure is a huge topic. The biggest asset a city owns gets the least amount of attention. Much of it is underground. Sad to say, but it’s a case of out of sight, out of mind.”

He knows infrastructure has a direct impact on water quality. “It’s all tied together,” he says. “Pollution continues. As we look ahead, it’s hugely important that we adapt and work through these issues so we can still provide clean water for people to fill a glass and flush their toilets, and for firefighting.”

The challenges don’t get him down. While the Midwest has daunting water issues, he keeps an eye on what’s happening elsewhere. “When you read about drought in other parts of the country and water shortages out west, you realize that water is not an infinite resource. We need to treat it with kid gloves, understand its importance and make it available for our use.”

“The biggest asset a city owns gets the least amount of attention. Much of it is underground. Sad to say, but it’s a case of out of sight, out of mind.”

ED BONHAM

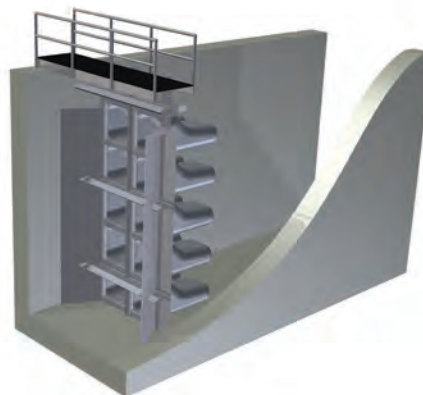
He doesn’t have all the answers to the critical questions, but based on his experience, he’s certain that the most pressing water issues will be solved in spite of the disparate interests in the environmental discussion: “We always come together. We always figure it out.” **tpo**

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A Shotgun Approach

MULTIPLE MEDIA AND EVER-CHANGING APPROACHES HELP A CALIFORNIA SANITARY DISTRICT DRIVE HOME TO CUSTOMERS THE PROBLEMS WIPES CAN CAUSE

By Craig Mandli

Many studies prove that to really hit home with your message, it needs to be delivered multiple ways. The public relations team at the Central Contra Costa Sanitary District of California follows that approach in ramping up communications urging citizens to avoid flushing wipes.

The education campaign about wipes began in 2009. More recently, the district launched a “Wipes Clog Pipes!” campaign, spreading the message at community events and through newsletters, social media ads and a giant billboard along Interstate 680. The district is also working with industry groups to develop new flushability guidelines and to improve wipes’ design and labeling.

“It’s a program we really try to do more with every year,” says Emily Barnett, communication services and intergovernmental relations manager. “We believe a successful program needs to be delivered seven times to make an impact. We do it in different sensory ways to create one comprehensive approach.”

MULTIPLE MEDIA

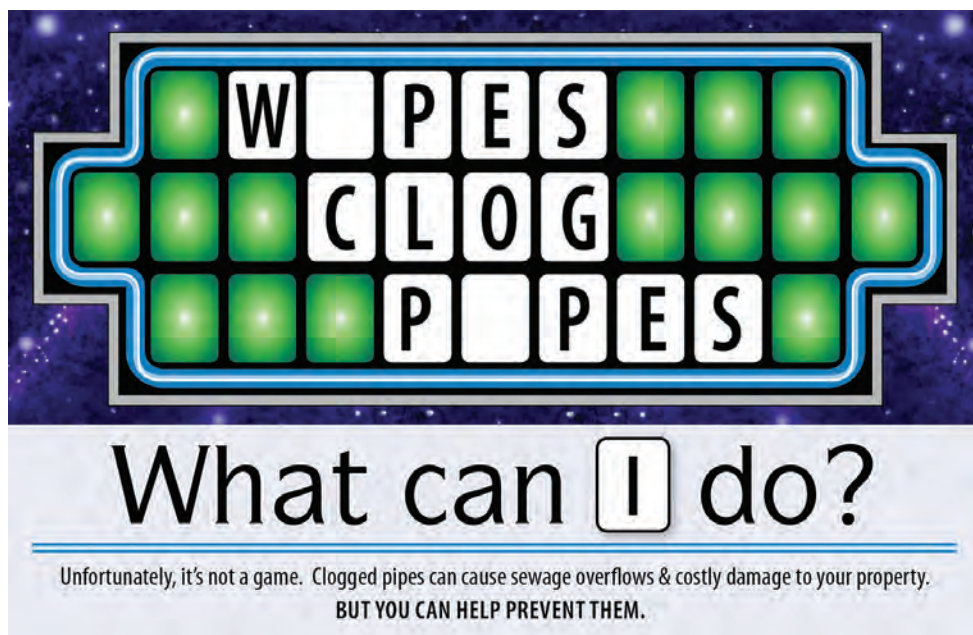
The campaign educates customers about what can and can’t be flushed. The varied media amount to what Barnett calls a shotgun approach. “Our wastewater treatment staff has had to deal with these problems every day,” says Barnett. The wipes cause blockages in sewer mains and on screens at treatment plants.

“We’ve been directed by our community leaders to focus on this problem,” says Barnett. “We hit our constituents with a similar message delivered through different avenues.” While the treatment plants have added equipment like grinders that chop up the wipes before they reach pumps, it’s a stopgap solution that just sends debris farther down the line, Barnett says. The outreach campaign aims to cut wipes off at the source.

“We are trying to raise awareness as well as change consumer behavior around some of these practices that we know are bad for our customers,” says Barnett. “They are expensive, they are messy, and they are bad for people’s health.” The campaign encourages people to throw wipes in the trash, instead of the toilet.

HUMBLE BEGINNING

The program began in 2009 as a single postcard *Wheel of Fortune* mailer that urged homeowners to mind what they flushed. Barnett says sewer backups were a natural issue to rally around, since they affect the water system from supply to wastewater.



The multifaceted “Wipes Clog Pipes!” campaign educates customers about what can and can’t be flushed.



“What we’ve learned by working on this for all these years is that our customers are not alone,” says Barnett. “Almost every wastewater treatment plant in North America is dealing with similar issues. Because of that, the lessons we are trying to get out there are universal and very adaptable regardless where you are.”

Learning from successful campaigns in other cities, “Wipes Clog Pipes!” doesn’t point fingers at customers. It paints nondegradable objects as the enemy and focuses on negative impacts to households.

PHOTOS COURTESY OF THE CENTRAL CONTRA COSTA SANITARY DISTRICT



A traveling demonstration shows the lack of breakdown of so-called "flushable" wipes compared to toilet tissue.



Part of the "Wipes Clog Pipes!" outreach includes visuals of what can happen when sewer wipes create wastewater backups.

"As much as we talk about all of the trouble it's causing our municipal infrastructure, we've found the best success when we look at the impact to the customer," says Barnett. "Of course, the most attention-grabbing impact is cost. This is a municipal problem, but it's also a household risk. When pipes in the home become clogged with non-flushable items, the expense is eventually passed down to the homeowner."

“As much as we talk about all of the trouble it's causing our municipal infrastructure, we've found the best success when we look at the impact to the customer. Of course, the most attention-grabbing impact is cost.”

EMILY BARNETT

The campaign doesn't focus solely on wipes; it urges people not to flush fats, greases, oils or unwanted medications. These are issues that can only be addressed by educating consumers. While wipes make up only a chunk of the objects clogging pipes, they are the only ones advertised as "flushable."

"We work directly with retailers to distribute information and urge them not to sell wipes that carry the 'flushable' tag," says Barnett. "That isn't always successful, but we feel that any education we can get out there helps us toward the final goal."

PROOF POSITIVE

To justify the outreach campaign, the district orders third-party surveys that test constituents' knowledge of the wipes problem. One survey was sent to a gated retirement community that had a large pipe-clogging problem brought on by flushed wipes. It found that residents of the community had very little knowledge that wipes they regularly flushed could cause issues.



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In response, the district hosted a community meeting, and sent its newsletter, *The Pipeline*, and targeted postcard mailers to residents. A second survey indicated that community knowledge had increased, and clogging issues quickly declined.

"There was a substantial drop-off in maintenance calls due to wipes clogging the pipes in that neighborhood," says Barnett. "That success caused us to look at what worked and how we communicated. More important, it told us that the only way to prove that the message is getting through is to have strategic testing done."

The program has earned outside recognition: Last year the San Francisco Bay Regional Water Quality Control Board presented the district with its annual WuHoo! Pollution Prevention Award, given in memory of former board employee Dr.

Teng-chung Wu, an early advocate for pollution prevention.

Melody LaBella, the district's pollution prevention program coordinator, accepted the award. "Melody has really spearheaded the whole campaign, and her enthusiasm has rubbed off on many others in our organization," says Barnett.

Barnett says the district is always looking for new avenues to expand its outreach, especially related to wipes. The key is to change up the message: "When you present the same message over and over, it gets stale, and people just stop paying attention. At the same time, the demographics of our communities and the ways they communicate are constantly evolving. If you aren't future-focused, you're already behind." **tpo**

What's Your Story?

TPO welcomes news about your public education and community outreach efforts for future articles in the Hearts and Minds column. Send your ideas to editor@tpo-mag.com or call 877/953-3301.

Seeing Leads to Doing

A CUSTOMER ENGAGEMENT PLATFORM HELPS A FLORIDA COMMUNITY PROMOTE WATER EFFICIENCY, ENCOURAGE CONSERVATION AND PROTECT VITAL SUPPLIES

By Jim Force

The St. Johns River Water Management District in Florida has launched a customer engagement platform to determine if utilities can promote water efficiency among users and ultimately conserve water.

Based on data collected since last fall in the city of Ocala, the platform appears to be successful on both counts. Called WaterSmart, it enables water utilities to analyze meter data and help customers conserve and therefore protect vital water supplies.

Scott Laidlaw, chief of the district's water supply planning bureau, says the customer engagement platform has led to savings of about 4 million gallons since it was implemented last September for 5,000 residential accounts in Ocala.

The most recent results indicate a 5 percent reduction in water use by platform users. Customer satisfaction with the utility's water services has improved by 35 percent. Program results are validated using randomized trials comparing the 5,000 customers who receive the WaterSmart program against a control group of 5,000 Ocala residences that do not. "It's significant," Laidlaw says.

Ocala draws water from the Floridan Aquifer, and is located near Silver Springs, one of the state's most treasured natural resources. Water conservation is critical in Ocala and throughout central and northeastern Florida, Laidlaw points out.



The WaterSmart program displays all meter data for the user's account in a dashboard. Utilities can run analytics, like reviewing the biggest commercial accounts for increases or decreases in usage, or how many people are taking part in a low-flow plumbing fixture program.

GROWING REGION

Under the Florida Water Resources Act of 1972, the state had five water management districts. The St. Johns River district includes 18 counties and stretches from the Jacksonville area in the north, south along the coast to

“We can be in constant contact with the customer regardless of the meter reading interval. The idea is to get customers to pay attention to their water use and make changes.”

CHRIS PATTON

Vero Beach, and inland to Gainesville and Ocala. The district is responsible for developing and implementing a regional water supply strategy, protecting water quality, preserving natural resources and controlling floodwaters.

The population continues to grow rapidly here, and with it, concerns about the future of the water supply. Laidlaw says the City of Ocala (popu-

lation 58,000) was chosen for the WaterSmart program because it is near the Springs and needs to conserve water. The city's water treatment plant is rated at 24.4 mgd, and Ocala “is a good steward of the environment,” says Laidlaw. “They’ve been willing partners with us.”

The contract with WaterSmart runs through the end of September 2017. Working with the utility's IT staff, WaterSmart provides an analytics dashboard that utility managers use to engage customers and gain insights on consumption.

DATA VISIBILITY

“The dashboard contains all of the meter data for the residential and commercial accounts, along with property and housing data, and the ability to run analytics, like analyzing the biggest commercial accounts for increases or decreases in water, or how many people are participating in the low-flow flush toilet program,” says Chris Patton, director of municipal markets at WaterSmart.

“WaterSmart also provides an online and mobile customer portal and water reports that allow users to view critical data and learn how to conserve water, based on the utility's regular meter readings.”

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WaterSmart works with residential, commercial, industrial and all other meter classes, says Patton. “We can be in constant contact with the customer regardless of the meter reading interval. The idea is to get customers to pay attention to their water use and make changes. Customers don’t understand how clean water gets to their taps.”

SUSTAINABLE SUPPLIES

The Ocala project seems to be successful on that score. Patton reports that 70 percent of the customers in the test group are paying attention and changing how they use water.

Sustaining water supplies is on the minds of water managers almost everywhere. Laidlaw and Patton agree that conservation can and should play a major role in preserving supplies for future generations.

“It’s the most cost-effective method,” Laidlaw says. “Before we spend millions on water supply projects or other infrastructure, we need to look at a variety of ways to reduce consumption and dependence on groundwater or surface water sources.”

Patton adds that conservation is not harmful to water utilities. “There’s a paradigm shift

taking place. When you add up all the costs of treating and pumping clean water, conservation is a financially good move for water utilities.”

tpo

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Users can view their water data on a variety of platforms, including mobile devices like tablets and smartphones.

Customers can see the data on their computers, through email messages or in paper form, whichever they prefer. They can also receive leak alerts through text, email and voice. They are informed about their home’s water use in relation to homes of similar size and climate. In addition, they receive personalized information about household water use and customized water-saving recommendations. Targeted communications go to users who may be experiencing leaks or excessive usage during certain parts of the day.





The main entrance to Plant City Water Reclamation Facility.

Complete Package

AN EXPERIENCED AND ENERGETIC STAFF
AND STATE-OF-THE-ART SYSTEMS SPELL EXCELLENCE
FOR THE WATER SYSTEM IN PLANT CITY, FLORIDA

STORY: **Jim Force**

PHOTOGRAPHY: **Robert Herrera**

THE OPERATORS AT THE PLANT CITY UTILITIES Operations Division are truly a multi-talented team.

They receive one-on-one training from a dedicated operations trainer when they join the staff. And once up to speed, they rotate from job to job, developing expertise in not only water treatment, but also wastewater treatment and water reclamation.

"All our operators are trained on evaluation and review of data, trends and monitoring," says Steve Saffels, utilities superintendent for Plant City, about a dozen miles east of Tampa, Florida. "And they are encouraged to obtain advanced licensing through an incentive program that will give them percentage pay increases and one-time bonuses per advanced license. The more they know, the better off we'll be!"

AQUIFER SUPPLY

Plant City draws its water through a series of wells drilled into the Floridan Aquifer. One of the world's most productive groundwater sources, it underlies all of Florida and coastal areas of Georgia, Alabama and South Carolina.

The first well and a 250,000-gallon elevated storage tank were built in 1965. The installation was upgraded in 1997 with a high-service pump station and a 750,000-gallon inground storage basin. Additional wells were

added in 1974, 1983 and 1989, each paired with 500,000-gallon elevated storage tanks. Well depths vary from 734 feet to just over 1,200 feet. A fifth well is under design.

At each well site, the water is dosed with polyphosphate to sequester iron and control corrosion of lead and copper. While Plant City has no lead pipes, the ductile iron pipes installed before the 1980s have lead-filled joints. Before water enters the storage tanks, sodium hypochlorite is added for disinfection and hydrofluosilicic acid for dental protection. Total water production is 5.3 mgd, although the system has a permitted capacity of 14.2 mgd.

Produced water flows by gravity from the elevated tanks and is pumped from the inground storage tank into a 135-mile looped distribution system. Pipe sizes range from 1 to 16 inches; about 36 percent of the lines consist of 6-inch ductile iron pipe. The system serves 12,900 metered customers, some with manual and others with radio meter reading.

The system has an approved 4-log virus removal plan using a set minimum disinfectant residual, a set minimum tank volume, and water temperature and pH calculations to achieve compliance. Plant City won the Best Medium System award from the Florida Rural Water Association in 2013. In 2014, the utility was honored for operational excellence by the Florida Department of Environmental Protection.



Paul Cockrell, left, maintenance foreman, and Patrick Murphy, chief plant operator, discuss fluoride PLC settings on a C-more touch-screen panel (AutomationDirect).

The system has operated in compliance with all regulations for more than 10 years. The sanitary survey inspection for 2015 found no deficiencies, and the system as of February 2016 has reported 48 months, and counting, without a lost-time accident.

VERSATILE STAFF

“Our facility is staffed 24 hours a day, seven days a week,” says Saffels. The 19 staff members in the utility’s Operations Division operate four drinking water plants, the wastewater treatment plant and the reclaimed water facility, while also managing distribution water quality. All operations staff members are required to achieve the Florida Department of Environmental Protection (FDEP) Level C Water and Wastewater certifications.

The utility’s Maintenance Division is scheduled eight hours a day, five days a week and provides preventive maintenance and repairs to all water, wastewater and reclamation facilities. Personnel working on the water systems must obtain the FDEP Level 3 Distribution System certification.

The wells and interconnect are all monitored remotely via a Trihe-

“When a customer’s concern is received, the staff immediately contacts the appropriate department’s on-call person for customer response.”

STEVE SAFFELS



Plant City (Florida) Utilities Operations Division

POPULATION SERVED: | **36,000**

AREA SERVED: | **28 square miles**

SOURCE WATER: | **Floridan Aquifer**

TREATMENT: | **Polyphosphate (corrosion control), sodium hypochlorite (disinfection), fluoridation**

CAPACITY: | **14.2 mgd**

SYSTEM STORAGE: | **2.25 million gals.**

DISTRIBUTION: | **135 miles of water main**

ANNUAL BUDGET: | **\$8 million (operations)**

WEBSITE: | **www.plantcitygov.com**

GPS COORDINATES: | **Latitude: 28° 1'21.56"N; longitude: 82° 9'22.25"W**



Steve Saffels, utilities superintendent, displays the awards wall at the Plant City Water Reclamation Facility.



The iconic Strawberry Water Tower in Plant City holds 500,000 gallons.

dral VTS SCADA system. A Hach Water Information Management Solution (WIMS) provides electronic tracking of operational and reporting data; Transcendent enterprise asset management and computerized maintenance management system (Mintek) tracks plant maintenance electronically.

The staff keeps the water safe through comprehensive cross-connection and flushing programs. The utility's operations center responds to customer concerns around the clock. "Our phone number is the after-hours contact number for all Public Works departments," Saffels says. "When a customer's concern is received, the staff immediately contacts the appropriate department's on-call person for customer response." Customers are most often con-

CONSERVING WATER

Even though Plant City draws its water from the plentiful Floridan Aquifer, water conservation is important in the state. Observers point out that Florida's growing population and varying rainfall mean that water usage often outpaces replacement.

On its website, Plant City reminds citizens that 50 percent or more of the water used at the average Florida home is for outdoor irrigation. The city maintains an outdoor irrigation schedule and restrictions designed to support healthy landscapes while avoiding waste.

The city also advises residents to use garden hoses, hose-end sprinklers and garden hose timers to target specific areas, especially for small lawns. Regulations require "smart" irrigation systems that shut off during periods of sufficient moisture.

In its water conservation tips section, the website suggests residents check for leaks in toilets, faucets and showerheads. Lawn watering recommendations include placing empty cans in the sprinkled areas to monitor how much water is being used. A 1/2 or 3/4 inch of water is sufficient for most of the state's sandy soils. The city offers free garden hose and indoor water-saving kits, as well as rain barrels.

The city's 10 mgd water reclamation facility produces clean effluent that can be used for commercial and industrial applications and to irrigate orange groves, lawns and nurseries.



Team members from the Plant City utility connect HDPE tubing from a water main to a customer water meter. Pictured, from left, are David Velez, Luis Baez, and Victor Castro, maintenance specialists.

cerned about chlorine residual, taste, odor and color, and all operators are able to handle those concerns.

DATA SOPHISTICATION

The groundwater wells at Plant City date back nearly 60 years, but the electronic control and information systems are state of the art and have proven to be wise investments. The city has an annual contract with Hach that goes back 10 years; the system is continuously refined.

“Years ago, we penciled information on a piece of paper, then entered the information into a spreadsheet,” says Saffels. “All of our operator reports were done by hand. I would spend a day or more just inputting the data, orienting it, and then mailing out copies. Each of our four wells had a different report.”

Now the WIMS gathers data continuously and publishes it on a routine basis. Staffers can print out reports, scan them and email them monthly. “Preparation time has been reduced from a day or more to an hour and a half,” he says.

Likewise, the Transcendent system has modernized maintenance. All equipment is tagged so that it’s easy to scan a pump or a motor and log the information into the system. “The program syncs with software that produces maintenance reports,” says Saffels. While the program hasn’t reduced the number of staff needed to operate the system, it has greatly improved preventive maintenance and financial performance. “It helps prevent break-

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downs,” says Saffels. “We can perform predictive maintenance, allowing us to be better prepared for breakdowns or service disruptions.”

Finally, the Trihedral SCADA system provides remote control capability to start and stop pumps, adjust tank levels, and open and close valves to the distribution system. Well flow, tank flow to the distribution system, tank levels, system pressures, pre- and post-tank free chlorine residual, system intrusion alarms, auxiliary generator status, and power supply status are all closely monitored. Saffels especially likes the pre-alarm on lift stations, which notifies staff members and lets them respond before an alarm actually goes off and disturbs neighbors.

AMPLE INNOVATION

Saffels, who has been at Plant City for 43 years, is passionate about his staff: “They’re amazing, with holistic approaches and the desire to be No. 1 in all aspects of operations and treatment. They’re dedicated to excellence and conscientiousness. The recognition our facilities have received from the various organizations and regulatory agencies demonstrates this.”

Staff members take ownership of the facilities and are involved in system improvements. Saffels points out a recent innovative idea that has saved lots of headaches, aggravation and potential fines.

“The waste cleanup rule of the Florida Administrative Code is activated when a spill is reported to the state watch office or the Bureau of Emergency Response,” he says. Since a sodium hypochlorite spill of 85 gallons or more is a reportable quantity, the maintenance staff adjusted the chemical handling system to prevent such spills. The old chlorine line was belowground, and as the chemicals caused the PVC to break down, they would leak into the ground.

“Kudos to maintenance for solving that,” says Saffels. “They ran a solid one-piece chlorine feed line through the 2-inch carrier piping from the containment centers for the bleach tanks to the injection points, basically making a double-walled piping. With the injection point being higher than the containment, if there is a leak in the chlorine feed line, it will flow back through the carrier piping to the containment point, instead of spilling into the ground.”

FACING CHALLENGES

That’s just one example of problem-solving at Plant City. “Due to the age of our systems, we are finding it harder to obtain parts,” says Saffels. “All of the wells have different electrical and mechanical parts, so keeping an inventory on hand is not economically feasible. To resolve that, we have established capital improvement projects to update our pumping, electrical and SCADA systems and are currently in the design phase.”

Changes in regulations are another challenge. Plant City has responded by focusing on its sweet spot: staff training. “To help keep up with rule changes, we have established a budget to provide formal training through seminars, conferences and the various trade magazines we receive,” says Saffels. “We also do in-house discussions on our systems operations and compliance needs during our shift turnovers.”

Communication is key. “As superintendent, I’ve always maintained an open-door policy and invite anyone to come in to discuss their concerns,”



The administrative team at Plant City includes, from left, Frank Coughenour, utilities director; Tanya Grant, project coordinator; Lucy Gassaway, staff engineer; and Dave Buyens, assistant utilities director.



The Plant City operations team includes, from left, Patrick Murphy, chief plant operator; Brett Miller, plant operator 1 trainee; Josh Lawson, plant operator 4; Steve Saffels, utilities superintendent; Joel Young, plant operator 2; Zoe Chaiser, compliance coordinator; Wayne Everhart, superintendent of maintenance; and Mark Woodward, water conservation specialist.

says Saffels. “There have been very few instances where I have been forced to ask someone, ‘Can this wait until later?’”

Plant City is an award winner with an impeccable record of compliance, committed to training and communications. In short, says Saffels, “It’s a good place to work.” **tpo**

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Finding Fair Value

RECEIVING SEPTAGE CAN BE A CHALLENGING VENTURE, BUT WITH THE RIGHT EQUIPMENT AND AN APPROPRIATE FEE STRUCTURE, IT CAN BE A VALUABLE SOURCE OF REVENUE

By Ted J. Rulseh

It's one thing for a clean-water plant to receive septage. It's another to do it with high efficiency and positive cash flow, and with no disruption to the treatment process.

John Olson, P.E., gave a formula for optimizing septage acceptance and handling during a seminar at the 2016 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show in Indianapolis last February.

Olson, a regional sales manager with Lakeside Equipment Corporation, described essential features of septage acceptance stations, the benefits and pitfalls of different types of hauled wastewater, and the basis for setting fees that reflect the true cost of receiving, handling and treating the material.

"The septage acceptance plant requires a heavy-duty design," Olson said. "It should be fully automated so haulers can come in, swipe a card, and discharge their load. The decision to accept any hauled material becomes the plant operators' responsibility. Therefore, the basic design should be customized to their needs."

DEFINING SEPTAGE

Olson's presentation treated the term "septage" broadly to include a variety of liquid wastes. "Septage includes septic tank waste, cesspool waste and holding tank waste," he said. "Every year, 5.5 billion gallons of septage are created in the United States from the equivalent of 24.6 million households." He described six sources of material with potential to be delivered to a treatment facility's septage acceptance plant:

- Residential waste, generally consistent and predictable in character.
- Commercial waste, typically high in oils and grease from restaurants.

“It's important to consider the effective load on the plant. The effective load reflects how fast that load is added to the process.”

JOHN OLSON, P.E.

- Waste activated sludge from other treatment works.
- Industrial waste, highly variable from one industry to another; these wastes must be tested for toxicity in the process and most likely require pretreatment.
- Landfill leachate, also site specific, potentially toxic and in need of testing and pretreatment.
- Portable restroom waste, typically high in ammonia and total nitrogen, and often containing bottles and other large objects.

IMPACTS ON TREATMENT

Olson stressed the need to understand the character of material delivered. To illustrate, he showed a table comparing domestic wastewater treatment plant influent to much-higher-strength household septage. His figures (Table 1)

TABLE 1

Typical Wastewater Characteristics			
PARAMETER	SEPTAGE*	WASTEWATER*	RATIO
TS	40,000	720	55:1
TVS	25,000	365	68:1
TSS	15,000	220	68:1
VSS	10,000	165	61:1
BOD ₅	7,000	220	32:1
COD	15,000	500	30:1
TKN	700	40	17:1
NH ₃ -N	150	25	6:1
TOTAL P	250	6	42:1
ALKALINITY	1,000	100	10:1
GREASE	8,000	100	80:1
pH	6.2	7.2	-

*values in mg/L

showed that septage contains, for example, 80 times the concentration of grease and 17 times the concentration of total nitrogen as typical wastewater.

To avoid upsets, he observed, it is essential to meter the hauled waste into the plant process instead of introducing it as a slug load. That means adding a holding tank to store the material and an automatic metering system. "It's important to consider the effective load on the plant," Olson said. "The effective load reflects how fast that load is added to the process."

"Consider a 3,000-gallon truckload containing 50 pounds of TSS. If that load is discharged into the plant in 15 minutes, you have a multiplier of 96 for that load. Your effective TSS load for that 3,000 gallons is 4,800 pounds. So you have to consider metering to reduce the effective load. If you select eight hours as the metering time and meter the load in overnight, when plant loadings are lower, your effective load multiplier is 3-to-1. You can handle that."

STATION ATTRIBUTES

Olson observed that septage receiving stations are increasingly sophisticated. Years ago, he said, they included little more than 1-inch bar screens and no grit or grease removal. Systems were manually operated and labor intensive; they discharged screened septage directly into the treatment stream.

Today's systems can be configured for extensive pretreatment and with automated operation, requiring minimal attention from treatment plant staff. They are made of stainless steel for corrosion resistance and are fully enclosed to control odors. Depending on the treatment plant's specific needs, features can include:

- Rock trap to capture large, heavy objects.
- Fine bar screen, cleaned automatically with a rake mechanism.
- Automated washing, compaction and dewatering process for screenings.



A well-designed septage receiving station can be a valuable source of revenue. Plant operators can select from a wide range of features to suit their specific requirements.

- Screenings bagging system.
- Grit removal and dewatering process.
- Skimming mechanism for grease collection.
- Flowmeter to measure gallons delivered.
- Pneumatic or electrically actuated inlet valves in a variety of sizes.
- Inline pH meter with capability to close the inlet valve if material with pH outside a specific range is detected.
- Chemical addition for pH adjustment.
- Weather protection including tank insulation and heat trace.
- Explosion-proof control panel where warranted.

ACCOMMODATING HAULERS

Given that haulers in many areas can choose where to take septage, Olson cited the importance of easy, convenient access to the receiving station. "Haulers want to be able to unload quickly — that is very critical," he said.

A typical unloading area includes a 4- or 6-inch inlet valve with quick-connect hose hookup and an emergency stop switch. High-traffic plants can include dual systems that enable two trucks to unload at the same time. "The haulers operate the system by swiping a card or entering an ID number," said Olson. "The treatment plant operator doesn't have to be outside to run the equipment."

The systems can include a touch-screen human machine interface (HMI) that lets plant operators know when a hauler is using the station; an on-screen emergency stop button is provided. The system can be configured to issue the hauler a customized invoice or to securely accept credit card payment and print a receipt.

For larger facilities, data management and accounting capability can be added, collecting the hauler name, hauler ID number, unloading start time and date, unloading duration, waste type, gallons delivered, and other information. Plant managers can then download the stored data for review.

PRICING IT RIGHT

The most essential aspect of receiving septage is charging a fair fee. Here, flow metering is critical. So are an analysis of the waste delivered and understanding the true costs of treatment. The first step is to calculate the pounds of BOD, TSS, nitrogen and phosphorus in a given truckload. Actual treatment costs vary from one plant to another. Components of those costs and thus the fee charged should include:

- A flow charge per gallon for the truckload, reflecting the basic costs of capacity and depreciation of plant equipment.
- Pounds of TSS multiplied by the dollars to remove each pound received.
- Pounds of BOD multiplied by the dollars per pound to provide oxygen for aeration.

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- Net biosolids yield multiplied by the dollars to stabilize and process the material and haul it to its final destination.
- Pounds of nitrogen multiplied by the dollars per pound to provide oxygen for aeration.
- Pounds of phosphorus multiplied by the dollar cost of chemicals used per pound removed (plus an adder for depreciation on the chemical feed equipment).

The total of those cost components provides a sound basis for establishing fees for waste haulers, Olson said.

The bottom line: An efficient process for receiving and handling hauled waste, combined with an appropriate fee structure, can enable clean-water plants to offer a valuable service to their communities and generate revenue for plant upkeep, equipment replacements and upgrades needed to maximize performance and maintain consistent permit compliance. **tpo**

Solution Upstream

A TEXAS TEAM AVOIDS A COSTLY PLANT UPGRADE FOR PHOSPHORUS REMOVAL BY WORKING WITH INDUSTRIAL AND COMMERCIAL CUSTOMERS TO REDUCE THEIR INPUTS

STORY: **David Steinkraus** | PHOTOGRAPHY: **Mark Greenberg**



WHEN THE TIME CAME TO RENEW ITS NPDES permit, the team in the City of Seguin received an unpleasant surprise.

In 2010, as part of a focus on reducing phosphorus discharges, the Texas Commission on Environmental Quality proposed a limit of 1 mg/L. Seguin's wastewater treatment plants had been discharging about 10 mg/L.

Seeing the significant and unplanned cost to comply, the Seguin team asked for a conversation with TCEQ officials, says Gilbert Ybarbo, plant superintendent. As talks progressed, the regulators admitted they were mainly interested in dropping effluent phosphorus below 5 mg/L, the threshold for harm to the Guadalupe River, the plant's receiving stream.

After more discussion, the state agreed not to impose the limit for three years, giving the city team time to study the problem and consider options costing less than a plant process upgrade. In the end, the Seguin team not only beat the proposed 5 mg/L limit, but avoided having a phosphorus limit in its current permit. That saved customers millions of dollars.

The team did it by working closely with customers upstream to reduce phosphorus inputs to the system. Money saved by avoiding a plant upgrade can instead be devoted to improving and expanding existing treatment facilities.

ON THE GROW

Seguin, a fast-growing city of about 26,000, lies 35 miles northeast of San Antonio. It is a county seat dating to the 1800s, and is home to many commuters who drive 40 minutes to San Antonio or 45 minutes to Austin.

“What did the trick with the restaurants was a change in detergents and making sure their grease traps are serviced regularly.”

RENE PORRAS

Operator Jose Nava measures the clarifier sludge blanket at the City of Seguin's Walnut Branch Wastewater Treatment Plant.

In the last decade, the city has gained local employers, notably an engine factory, a commercial bakery supplying grocery stores and other retail outlets, a water bottling company, and a poultry processing plant. There are seven permitted industrial users and nearly 100 restaurants.

Also among the 8,500 sewer connections in Seguin's 25-square-mile service area are the homes of many retirees. Along with the industrial growth has come a housing boom, says Emery Gallagher, director of the city's water and wastewater utilities. In 2012, the utility expanded its service area to include rural communities outside Seguin's border.

Wastewater flows to the Geronimo Creek and Walnut Branch treatment plants. Geronimo is the newer and smaller plant, built in 1987 east of the city. It will handle the community's growth, and the site includes enough land to expand it as needed. Walnut Branch was built in the 1950s. The city

The team at the Walnut Branch Wastewater Treatment Plant includes, from left, Brandon McBride, chief operator; Eugene Robinson, operator; Gilbert Ybarbo, superintendent; Jose Nava, operator; Rene Porras, pretreatment coordinator; and Jestin Peeples, operator in training.

grew to surround the plant, but there is still enough land to double its size.

Walnut Branch is designed for 4.9 mgd and has an average flow of 2.8 mgd. Geronimo is designed for 2.13 mgd and has an average flow of 1.2 mgd. The annual wastewater operations budget is about \$3 million.

Handling that budget and plant operations is a team of eight: Ybarbo; Rene Porras, pretreatment coordinator; Brandon McBride, chief operator at Walnut Branch; Gilbert Perez, chief operator at Geronimo; Jamie Alvarez, Jose Nava, and Eugene Robinson, plant operators; and Jestin Peeples, operator in training.

Seguin (Texas) Wastewater Treatment Plants

BUILT: | **Walnut Branch - 1950s, Geronimo Creek - 1987**

POPULATION SERVED: | **27,000**

SERVICE AREA: | **25 square miles**

FLOWS: | **Walnut Branch 4.9 mgd design, 2.8 mgd average;
Geronimo Creek 2.13 mgd design, 1.2 mgd average**

TREATMENT LEVEL: | **Secondary**

TREATMENT PROCESS: | **Activated sludge**

RECEIVING WATER: | **Guadalupe River**

BIOSOLIDS: | **Landfilled**

WEBSITE: | **www.seguintexas.gov**

GPS COORDINATES: | **Latitude: 29°33'20.47"N; longitude: 97°58'48.12"W**





“Once they understood what we were trying to achieve, and what the alternative would cost the city and them, they worked closely with us.”

EMERY GALLAGHER

IN TRANSITION

“We have two influent locations for the Walnut Branch plant,” Ybarbo says. One is a lift station and a force main serving the western part of the city, and the other is a gravity-fed pipe for the east side. They join just above the bar screen. Sludge and scum that accumulate there are pumped to aerobic digesters.

The wastewater then goes to the aeration basins outfitted with Enviroquip (Ovivo) diffusers and on to the secondary clarifiers (also Ovivo). Secondary effluent flows through V-notch weirs into a gravity trough that feeds the chlorination chamber. A dechlorination chamber follows, and a 30-inch pipe takes the treated water to the Guadalupe River.

The plant is staffed on a single shift from 7 a.m. to 3:30 p.m. For unstaffed

Jose Nava observes as Jestin Peebles, operator in training, tests for dissolved oxygen in the aeration basin (Ovivo).

hours, an alarm system is hardwired to sensors or floats. If an alarm is triggered, the system automatically dials the cellphones of all staff members. A SCADA system is in the budget to support the plant’s expansion and growing sophistication.

Geronimo uses the same basic process but includes a large oxidation ditch with Passavant Mammoth Rotor brushes (Evoqua). Its bar screen comes from Infilco Degremont (SUEZ). Biosolids from both plants are dewatered and landfilled.

REUSE WATER YIELDS POWER — AND REVENUE

In the arid Southwest, there are better things to do with treated wastewater than send it downriver toward the ocean. The utility in Seguin, Texas, found a customer and a source of revenue in the Rio Nogales Power Project, which operates a natural-gas-fired power plant in the city.

“Last year we sold them about 335 million gallons of reuse water and another 720 million gallons of potable water,” says Emery Gallagher, director of water and wastewater utilities. All the water is for the plant’s cooling towers. The city does no polishing of the water. Instead, the power plant team adjusts the pH and other parameters to match its requirements.

A new owner recently took over the plant and is especially interested in resource conservation. Previously, power plant cooling used about 32 percent reclaimed water and 68 percent potable water. Now it’s about 40 percent reclaimed water and 60 percent potable. Water used by the power plant flows to the Geronimo Creek treatment plant and discharges into the Guadalupe River.

“We’ve talked about enhancing that reuse and installing filters so the power plant can run completely on reused water,” Gallagher says. Filters are not in use now and would be part of the long-term plan. At the moment, the utility is doing a study to determine what water quality the power plant needs and what the utility might do to meet that need.

Providing this service produces positive cash flow for the city. Within the next 10 years, two trends should further benefit the city, Gallagher says. First, the growth of Seguin will increase the amount of wastewater, and the Walnut Branch plant will be expanded to handle it. Second, the power plant should be running more, and using more cooling water, because of the owner’s plan to comply with air pollution rules by decommissioning an old coal-fired power plant.

As the utility adapts to provide more reclaimed water, potable water not sold to the power plant may be sold to other customers, or that capacity may be held in reserve for future growth. “Cities throughout the nation are always looking at water,” says Gallagher. “Once you secure those water resources, you keep them.”

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MINDING P'S AND Q'S

After the TCEQ granted a reprieve on the phosphorus limit, the question for the Seguin team was how to study alternatives for phosphorus reduction. The team worked with representatives from TRC, the city's consulting engineering firm, to develop a sampling and monitoring plan.

They began with nine points, but as the process went on they realized they could make do with six points. That was easier for Porras, the pre-treatment coordinator, because he did much of the field work. The sample points were established to test influent at the plant and at all of the city's main sewer trunk lines so that the team could determine what section of the city, and thus which customers, were the main phosphorus contributors.

The monitoring revealed that the largest source of phosphorus was the poultry plant, followed by the engine plant, and then a number of connec-



Eugene Robinson, operator in training, performs a 30-minute settleometer test, supervised by Rene Porras.

Walnut Branch Wastewater Treatment Plant PERMIT AND PERFORMANCE

	PERMIT	EFFLUENT
BOD	10 mg/L	2 mg/L
TSS	15 mg/L	1.14 mg/L
Nitrogen	3 mg/L	0.2 mg/L
Coliform	126 CFU/100 mL	1.4 CFU/100 mL

tions that included restaurants. The team set out to talk to the customers and explain the problem.

“Rene and I did a lot of legwork with both the poultry plant and the engine plant,” Ybarbo says. “We provided plans to the commercial users. We televised lines and did smoke testing, or used ink dye where smoke testing was not an option, to find cross connections. We looked at floor scrubbers and identified the types of detergent they were using.”

The poultry plant in particular was responsive. For example, the facility installed a system of pipes and pumps to collect used marinade, which was high in phosphorus. The team there also replaced phosphorus-containing cleaners and sanitizers. The engine factory replaced its high-phosphorus cleaners with low- or no-phosphorus products. “The payout was that, since we didn’t have to impose a permit limit, they didn’t have to install any large new treatment system or use chemicals to remove phosphorus,” Porras says.

Of course, if the city had installed equipment at its own treatment plants to remove phosphorus, that would have added to all customers’ bills. “And not only is there the cost of the equipment, but there’s a continuing cost, too,” says Gallagher. “With engineering fees, I think we easily could have reached \$1 million to \$2 million on equipment, and that was three years ago. Then add the chemical costs, about \$120,000 annually. And we would have more solids to deal with. That’s another \$150,000 to \$200,000.”

CLEARING THE FOG

While the industrial sources were large and easy to see, restaurant grease was another important part of the phosphorus problem. Here, the key to the solution was Porras’ monitoring program. Many of the salts and seasonings used in restaurants contribute phosphorus to the wastewater stream, he says.

“They have to submit a permit application to us, and we work with them to evaluate the impact of what they’re proposing to do. Our goal is to be impact-neutral from the beginning.”

EMERY GALLAGHER

“What did the trick with the restaurants was a change in detergents and making sure their grease traps are serviced regularly,” Porras says. “But the trap is the more important part. If it’s being cleaned properly, none of the detergent or anything else enters the wastewater stream.”

Previously, it was common for these traps to overflow, and phosphorus-containing seasonings that came off food during cooking would flow into the sewer. Trap maintenance benefited restaurants because frequent pumping meant they were not regularly spending money to have plumbers unclog blocked drains, Ybarbo says.

The key to managing trap pumping is a good spreadsheet combined with the city’s pumping ordinance. Restaurants are required to send in their receipts from pumping contractors. Porras enters the information into a spreadsheet so that he can monitor the servicing without driving around the city to inspect traps.

Only four haulers deal with the restaurants in Seguin. “And we have a good rapport with the haulers, so if there’s a question about whether a particular restaurant was pumped recently, we can call the hauler and get the



A portable meter (Hach) is the Walnut Branch team’s tool of choice for dissolved oxygen measurement.

information we need,” Gallagher says. If the spreadsheet shows that a restaurant isn’t up to date, a phone call to the hauler handles that.

In reviewing manifests from last year, Porras found proper grease trap pumping kept about 250,000 gallons of grease waste out of the city system.

ESSENTIAL EDUCATION

Critical to the end result was education. “Once our team educated the industrial users, they were on board with us about the phosphorus limit,” says Gallagher. “Once they understood what we were trying to achieve, and what the alternative would cost the city and them, they worked closely with us. They wanted to be good neighbors, too, and we would never have been able to make this happen without their help.”

With new customers, the utility is taking a proactive approach. Instead of regulating later, utility staff members meet with new customers before a project begins. “They have to submit a permit application to us, and we work with them to evaluate the impact of what they’re proposing to do,” Gallagher says. “Our goal is to be impact-neutral from the beginning.”

Initial tests reveal how much phosphorus a commercial customer will generate, and that in turn dictates the Seguin team’s approach. Even if a customer’s phosphorus contribution will be minimal, the team provides educational material about the problems phosphorus can cause. Ybarbo observes, “Staying in front of it can really help reduce problems after the fact.” **tpo**

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The Science of Risk Communication

WHEN TALKING WITH CONCERNED CITIZENS, EMPATHY AND LISTENING
CARRY FAR MORE WEIGHT THAN FACTS AND FIGURES

By Doug Day

The lead contamination crisis in Flint, Michigan, has brought drinking water safety into headlines across the country. Lead service laterals are a real issue that water utilities have been managing for years. But your customers and the general public haven't been paying much attention to it until now.

Whether you are a water or wastewater utility, occasions may arise when you must talk to the public about situations involving risk. With a little preparation, communicating properly with concerned people can do much to calm their fears and put the risk in its proper light.

In fact, the process of doing that is called risk communication. More science than art, risk communication does not try to minimize concerns. Its goal is to provide accurate information in a responsive and respectful way in order to create an informed and involved public in which people can make their own sound judgments and choices.

When dealing with any risk topic, the approach is the same: Address people's perceptions in order to earn trust, build credibility and engage them in discussion and solutions.

Lead, fluoride, chlorine treatment, pharmaceuticals — the list of "risks" is long. What's on that list isn't up to you — it's all about perceptions held by the public. However, when dealing with any risk topic, the approach is the same: Address people's perceptions in order to earn trust, build credibility and engage them in discussion and solutions. Here are some basic rules.

Respect your audience. Perception is reality, so accept it. It's not the public's fault that they don't have all the facts.

Address emotions. The rules of communication change when people are concerned. Facts and statistics will not satisfy them. The risks that scare us and those that kill us are often on opposite ends of the spectrum — driving a car versus flying in an airplane. People aren't looking for facts so much as seeking trust, credibility, compassion, empathy and fairness.

Tell the truth — tell your story. There is a difference between accurate and truthful, at least in the minds of your audience. For instance, the Flint situation may prompt someone to ask if there is lead in your utility's water. While you may be correct in saying there is no lead in your water, that does not honestly address the real question, which is the risk of lead from service laterals or solder. So answer the real question, then explain what you are doing about it and what people can do to reduce their risk.

What is credibility?

When people are scared, your credibility has little to do with your job, title or degrees. It is an emotional judgment people make based on the feelings they get from the way you treat them and respond to their concerns.

Dr. Vincent Covello, founder and director of the Center for Risk Communication and a leading researcher in the field, has said, "When people are stressed and upset, they want to know that you care before they care what you know."

During the BP oil spill in 2010, in which 11 people died, the head of the company was seen at a yacht race while his oil well was still spilling millions of gallons of oil into the Gulf of Mexico. He once said how he wanted his life back. You can imagine how people whose lives were forever changed felt about that. Those and other gaffes contributed to his firing.

So, what goes into determining your credibility score? First of all: caring, concern, empathy, compassion and listening. These account for about half of your credibility score. It has much less to do with what you say than with how you say it. An audience will judge you quickly on these attributes.

After that, three sets of attributes carry about equal weight: honesty and openness, dedication and commitment, and competence and expertise.

You need a 100 percent credibility score to pass — there is no such thing as having "some" credibility. And credibility is easy to lose. As an old Japanese proverb says, "The reputation of a thousand years may be determined by the conduct of one hour."

Reach out in multiple ways. Websites and social media are good ways to address many of the concerns you can expect to hear from customers and the public. Arm your staff with speaking points so you can answer questions in person and on the phone, and monitor social media so you can quickly respond to questions and concerns.

Keep it simple. Now is not the time to show how smart you are. People want to know that their water is being treated properly and what you are doing to keep them safe. Unless they are interested in the details, they don't need to hear about zinc orthophosphate, pH, and the chemistry of corrosion control. Avoid jargon and technical language. People also have a hard time



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listening when they are upset, so use simple language and repeat key messages often.

Provide direct answers. A natural response to being questioned is to become defensive. You might reply to a question by saying, "We treat the water to prevent corrosion from service laterals and regularly test for lead and other substances. Water quality is our primary concern, and we take our responsibility very seriously. Yes, our water is safe." That isn't a bad response, but reverse order and notice how much more confident and strong it sounds; "Yes, our water is safe (that's the answer they wanted to hear). Water quality is our primary concern and we take our responsibility very seriously (a key message). We treat the water to prevent corrosion from service laterals and regularly test the water for lead and other substances."

Use third-party experts. Back up your statements with information from respected sources such as doctors, scientists and trusted people in your community. That's one benefit of having a citizen advisory group. You can spend more time explaining the fine points of such issues to them, and they can carry the message to the community.

Meet the needs of the media. The media is a key vehicle for getting your information out. Be open and available, respond quickly, and provide background materials and appropriate graphics and visuals based on the type of media. Do not view reporters as adversaries. They can help you reduce fear, educate the public and tell your story. **tpo**

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Flexible Control

AN EASY-TO-USE, SINGLE-PROCESS CONTROL PANEL GIVES USERS A WIDE RANGE OF OPTIONS FOR REGULATING WATER AND WASTEWATER SYSTEM OPERATIONS

By Ted J. Rulseh

Simplicity is important in controlling processes in water treatment and distribution systems. That simplicity includes freedom from installing and stocking numerous different control devices to regulate processes.

Singer Valve offers the SCP-TP single-process control panel as one device with the capability to control a variety of functions. It is designed for controlling variables including tank level, upstream/downstream pressure, flow and valve position. It means users may need to inventory just one type of control device for multiple single-process applications.

The controller is compatible with Singer Valve products as well as products from other manufacturers. It can provide proportional-integral-derivative (PID) feedback control as well as on/off control and 4-20mA motor control. It includes data logging capability and a variety of configuration options accessible through a color touch-screen interface. Ryan Spooner, instrumentation and automation manager, talked about the offering in an interview with *Treatment Plant Operator*.

tpo: What was the rationale behind developing this product for the marketplace?

Spooner: Our aim was to develop an all-encompassing controller that would offer multiple solutions to customers, so that they could buy one type of panel to control many different products that Singer Valve and other manufacturers sell. We tried to incorporate a wide range of capabilities that our customers have suggested to us.

tpo: How would you describe a single-process controller?

Spooner: It's capable of controlling multiple functions, but only one process variable at a time — such as level, flow, valve position or pressure. It's very easily interchangeable between controlled devices. The controller reads and compares the process variable 4-20mA signal to the user-selected setpoint. It then positions the valve to bring the process variable toward the setpoint until the two coincide.

tpo: What is the key advantage of a controller such as this one?

Spooner: The key advantages are ease of use and flexibility. We've

“We've made everything simple, even for users who don't have a great deal of experience with controllers. Any operator, with a little talk-through and an overview of how it functions, should be able to work with it from then on.”

RYAN SPOONER

made everything simple, even for users who don't have a great deal of experience with controllers. Any operator, with a little talk-through and an overview of how it functions, should be able to work with it from then on. In terms of flexibility, we tried to offer as much as possible in one controller so that customers can carry one controller on the shelf that can be used in many applications.

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tpo: How does the user set up the controller?

Spooner: The touch-screen interface provides access to establish the process value setpoint. It also provides access to control a valve manually. We designed the device to be unitless so that all the operator has to do is set it up for the range of sensor process values coming in. We accept a 4-20mA signal from any kind of sensor. If it's a pressure sensor, for example, the range might be zero to 200 psi. So the user would just set the control for zero to 200 and wouldn't worry about the psi.

tpo: What kinds of configuration options are available through the touch-screen panel?

Spooner: We provide access to change from PID control to on/off control or motor control. There is also an alarms menu. Each controller has two optional alarms that users can specify. For example, they can configure it to alarm in case a sensor should fail, or if the controller has been left in the manual mode. They also can program the control for strainer flush, so that instead of alarming when a valve strainer needs flushing, it would flush automatically at the time of day that they set.

tpo: Are there any other automated capabilities?

Spooner: The controller allows setpoint scheduling. Users can program up to 10 setpoints per day. They can create setpoints on the HMI, physically touching the screen. They can also create setpoints remotely by way of 4-20mA signal or Modbus. But if they don't want to be constantly adjusting setpoints manually, they can schedule them based on day of the week and time of day, such as to save money by reducing pressures or reducing flows at certain times.

tpo: Can this controller be used to gather or analyze data?

Spooner: The device includes a data logger that saves time-stamped data onto a micro-SD card. Users can store their setpoints and actual pro-

“Today, for example, a lot of utilities are trying to reduce pressures in their lines to help stop pipe breaks and reduce water losses. Actually seeing what has been happening can help them adjust setpoints and save money.”

RYAN SPOONER

cess variable data and graph it all over time down to intervals as small as one second. All data is logged in an easily readable CSV file. The controller also has live trending graphs that can be viewed on the HMI. Today, for example, a lot of utilities are trying to reduce pressures in their lines to help stop pipe breaks and reduce water losses. Actually seeing what has been happening can help them adjust setpoints and save money.

tpo: Is there any built-in security to protect settings once they are established?

Spooner: The controller is password-protected on two levels — an operator level and an administrative level.













tpo: Is there anything else prospective users should know about this controller?

Spooner: We offer it with AC or DC power input. Regardless, every unit has a 24-volt internal power supply, which is beneficial for connecting sensors. Because we are a UL-certified panel shop, every unit we build is UL-certified. In Canada everything needs to be CSA-certified, and UL meets that. Within the U.S., certain states also need the UL certification. **tpo**

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	Anaerobic Digesters	Bins/Hoppers/Silos	Biosolids Treatment/Application	Centrifuges/Separators	Chemical/Polymer Feed Equipment	Coagulants/Flocculants/Polymers	Composting Equipment	Conveyors
 OVIVO Bringing water to life See ad page 7	✓		✓					
OVIVO USA, LLC 2404 Rutland Dr., Austin, TX 78758 512-834-6000 Fax: 512-834-6039 info.us@ovivowater.com www.ovivowater.com								
 PARK PROCESS See ad page 82		✓	✓		✓	✓		
Park Process 7015 Fairbanks N Houston Rd., Houston, TX 77040 855-511-7175 713-937-7602 Fax: 713-937-4254 rcaughman@parkprocess.com www.parkprocess.com								
 Parkson			✓					
Parkson Corp. 1401 W Cypress Creek Rd., Ft. Lauderdale, FL 33309 888-727-5766 954-974-6610 Fax: 954-974-6182 technology@parkson.com www.parkson.com								
 PT&M Press Technology & Manufacturing See ad page 75			✓	✓				
Press Technology & Mfg., Inc. 1401 Fotler St., Springfield, OH 45504 937-327-0755 Fax: 937-327-0756 dberner@presstechnology.com www.presstechnology.com								
 PRIME Dewatering Performance - Simplified			✓	✓	✓	✓	✓	✓
Prime Solution 610 S Platt St., Otsego, MI 49078 269-694-6666 Fax: 269-694-1297 sean@theimageshoppe.com www.psirotary.com								
 ROTO-MIX See ad page 65							✓	
Roto-Mix, LLC 2205 E Wyatt Earp Blvd., Dodge City, KS 67801 620-225-1142 Fax: 620-225-6370 info@rotomix.com www.rotomix.com								
 SCHREIBER Pure Ingenuity See ad page 47								
Schreiber LLC 100 Schreiber Dr., Trussville, AL 35173 205-655-7466 Fax: 205-655-7669 info@schreiberwater.com www.schreiberwater.com								
 SCHWING BIOSSET See ad page 29		✓	✓					✓
Schwing Bioset, Inc. 350 SMC Dr., Somerset, WI 54025 844-246-7381 715-247-3433 Fax: 715-247-3438 marketing@schwingbioset.com www.schwingbioset.com								
 ScreenCo Systems See ad page 82								✓
ScreenCo Systems LLC 13235 Spur Rd., Genesee, ID 83832 208-790-8770 sales@screencosystems.com www.screencosystems.com								
SEEPEx. ALL THINGS FLOW See ad page 71		✓			✓			
SEEPEX Inc. 511 Speedway Dr., Enon, OH 45323 937-864-7150 Fax: 937-864-7157 sales.us@seepex.com www.seepex.com								
 S&L See ad page 45	✓			✓				✓
Smith & Loveless, Inc. 14040 Santa Fe Trail Dr., Lenexa, KS 66215 800-898-9122 913-888-5201 Fax: 913-888-2173 answers@smithandloveless.com www.smithandloveless.com								
 suez See ad page 67			✓					
SUEZ 8007 Discovery Dr., Richmond, VA 23229 800-446-1150 804-756-7600 info-inflico@degtec.com www.degremont-technologies.com								
 TANK CONNECTION See ad page 59	✓	✓						
Tank Connection Affiliate Group 3609 N 16th St., Parson, KS 67357 620-423-3010 Fax: 620-423-3999 sales@tankconnection.com www.tankconnection.com								

	Grinders/ Shredders	Grit Handling/ Removal/Hauling	Headworks	Pumps - Archimedes/ Screw	Screens/Strainers/ Screening Systems	Screw Conveyors	Septage Receiving Stations	Sludge - Dewatering/ Presses	Sludge - Dryers	Sludge - Hauling/Disposal	Sludge - Heaters	Sludge - Land Application	Sludge - Mixers/Thickeners	Other
		✓	✓		✓								✓	
		✓				✓	✓							Sludge Dewatering Containers
			✓		✓	✓	✓	✓	✓				✓	
		✓			✓	✓		✓						
			✓	✓	✓	✓	✓	✓				✓	✓	
		✓	✓	✓	✓									
						✓		✓	✓	✓		✓		
		✓			✓		✓						✓	
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		✓	✓		✓	✓	✓						✓	
		✓	✓		✓			✓	✓				✓	Sludge - Incineration

(continued)

 Trident Processes LLC 446 Harrison Street, #81D, Sumas, WA 98295 800-799-3740 604-330-2500 info@tridentprocesses.com www.tridentprocesses.com									
 UGSI Chemical Feed a UGSI Solutions Company 1901 W Garden Rd., Vineland, NJ 08360 855-669-3845 856-896-2160 Fax: 856-457-5920 info@ugsichemicalfeed.com www.ugsichemicalfeed.com									
 USABlueBook PO Box 9006, Gurnee, IL 60031 800-548-1234 847-689-3000 Fax: 847-689-3030 customerservice@usabluebook.com www.usabluebook.com									
 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									
 VFOLD INC. 15700 Robins Hill Rd., Unit #2, London, ON N5V 0A4 877-818-3653 Fax: 519-659-6523 sales@vfoldinc.com www.vfoldinc.com									
 WestTech Engineering, Inc. 3665 S West Temple, Salt Lake City, UT 84115 801-265-1000 Fax: 801-265-1080 info@westtech-inc.com www.westtech-inc.com									

Anaerobic Digesters	Bins/Hoppers/Silos	Biosolids Treatment/Application	Centrifuges/Separators	Chemical/Polymer Feed Equipment	Coagulants/Flocculants/Polymers	Composting Equipment	Conveyors
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				✓			✓					✓	
												✓	
							✓					✓	
	✓	✓		✓	✓	✓						✓	



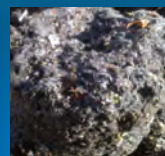
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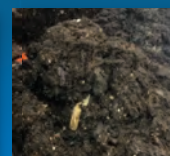
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Perre Krizanek, left, a Godwin sales representative, discusses the CD80M Dri-Prime automatic priming centrifugal pump with a WWETT Show attendee. The portable pumping system can deliver up to 450 gpm and 93 feet total dynamic head.



PHOTO COURTESY OF GODWIN, A XYLEM BRAND

Celebrating a Classic

PORTABLE CENTRIFUGAL PUMP FROM GODWIN
FITS MULTIPLE WASTEWATER APPLICATIONS

By Craig Mandli

Everyone knows the adage, “If it ain’t broke, don’t fix it.” While many attendees of the Water & Wastewater Equipment, Treatment & Transport (WWETT) Show come to see innovations, plenty also learn about proven products. One of those was on display in the Godwin, a Xylem brand, booth.

The 3-inch CD80M Dri-Prime automatic priming centrifugal pump is a compact and highly maneuverable portable system that can deliver up to 450 gpm and 93 feet total dynamic head. Jeff Fata, branch manager of Godwin’s office in Lansing, Illinois, says the unit fits across multiple industries and applications.

“This pump is great for dewatering, but can also be used in small wastewater bypass operations,” he says. “Because it’s a smaller pump, it is easy to handle, yet offers performance comparable to many bigger pumps.”

The pump comes mounted on a highway trailer or skid and includes an integral 30-gallon fuel tank. A recessed impeller model is available for high-solids streams. Indefinite dry running is no problem. The Dri-Prime system makes oversight and maintenance easy.

“It has a PrimeGuard controller, which is a state-of-the-art control system with automatic start/stop,” says Fata. “If you’ve ever had to venture out in a late-night rainstorm to prime a pump, you’ll appreciate the automatic self-priming features.”

The unit includes a close-coupled centrifugal pump with vacuum priming compressor mounted to a diesel or gasoline engine. It has cast iron construction with a cast chromium steel impeller (also available in 316 stainless

steel). The pump handles raw sewage, biosolids and liquids with solids up to 1 5/8 inches. It has abrasion-resistant solid silicon carbide interfaces and a solids-handling, mushroom-type non-return valve with renewable flexible rubber seat and quick-release access.

Maintenance is typically limited to checking engine and seal cavity oil levels. The standard engine is a Yanmar 3TNV76, but alternatives include Lister, Hatz, Perkins and Deutz. A silence pack is available for use in populated areas.

“Just this week alone we talked to people in the construction industry and general contractors, along with municipalities that would use the CD80M for sewer bypass and dewatering at their wastewater treatment plants,” Fata says. “We’ve had this pump on the market for a while, but we still consider it one of our mainstays.”

“If you’ve ever had to venture out in a late-night rainstorm to prime a pump, you’ll appreciate the automatic self-priming features.”

JEFF FATA

Godwin technicians continue working on innovations to bring to WWETT in 2017, including new low-emission engines and control panels that can be operated remotely via a smartphone.

“With the large fuel tanks, Dri-Prime system and these controls, our pumps will be completely operable offsite,” says Fata. “Efficiency is the wave of the future. That’s what people are looking for here, and that’s what we’re offering.” 877/959-9881; www.xylem.com/dewatering. tpo

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Life in Abundance

LAGOONS AT THE MARION TREATMENT PLANT SUPPORT TREATMENT WHILE OFFERING ABUNDANT OPPORTUNITIES FOR BIRD-WATCHERS AND WILDLIFE ENTHUSIASTS

By Jeff Smith

Two llamas, four goats, a pair of swans, several ducks, a few turtles, deer, fox, coyotes, and raccoon all sound like an advertisement for a community zoo. It's actually a list of some of the critters that make their homes around three lagoons at the Marion (Massachusetts) Wastewater Treatment Plant.

"We even have a bunch of chickens, and way more Canada geese than we care to see," says Frank Cooper, superintendent of the 0.59 mgd (design) sequential batch reactor (SBR) plant. "But lots of people enjoy the wildlife, and bird-watchers can't say enough about the many species we attract."

CRITICAL CAPACITY

The attraction to wildlife consists of 20 acres of facultative lagoons that have served Marion since 1971. In the 1990s, UV disinfection was added. Disc filters replaced sand filters in 2002. A nutrient removal upgrade in 2005 added the SBRs. Since then, the lagoons handle only flow equalization, along with enjoyment to bird-watchers and wildlife lovers.

"We have a lot of I&I, so storage capacity is important to us," says Cooper. The lagoons are important to the wildlife enthusiasts, too, but their existence is being threatened by tightening regulations and potential environmental concerns.

The plant still operates under the original NPDES permit; city officials are waiting for the U.S. EPA's response to their comments on the draft of a new permit. The plant diverts excess influent to the lagoons until the two SBRs can catch up. Average flow to the plant is nearly 0.5 mgd, but high rain and snow seasons can produce as much as four times that amount.

Two pairs each of 30 hp and 100 hp KSB pumps deliver excess flow to either one 10-acre or two 5-acre lagoons. Level sensors at the lagoons generate alarms through a Wonderware SCADA system (Schneider Electric - Invensys). A Flowserve electric actuator positions an aluminum weir gate

ABOVE, CLOCKWISE FROM LEFT: A killdeer nest built on good drainage and camouflage makes it hard to spot; a snapping turtle rests on an aeration pipe; and a fox stands guard in front of a disc filter building.

“Lots of people enjoy the wildlife, and bird-watchers can't say enough about the many species we attract.”

FRANK COOPER

valve to divert flow from the headworks to the lagoons. "Even though we are highly automated, the operators control the weir gate locally," says Nathaniel Munafo, assistant plant operator.


A small amount of flow used to backwash the disc filters also goes to the lagoons. Return flow for processing in the SBRs is delivered through two Hayward Gordon ChopX-3A 5 hp pumps and a 4-inch return line. "The lagoons are a buffer and critical to our operation," Cooper says.

Effluent is discharged to an unnamed, non-spring-fed drainage stream that flows to Aucoot Cove, a saltwater body attached to Buzzards Bay. The initial permit draft says the plant must stop using the lagoons for solids management or else drain, dredge and line them.

QUALITY VIEWING

The lagoons are fenced and gated, and have no public access. Bird-watchers and wildlife lovers observe from the top of a capped landfill next to the plant. For an even better look, the plant allows observers to view the lagoons from the top of the headworks building. "It gets them up about 10 feet so they can look over the fence," says Cooper.

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The team at the Marion Wastewater Treatment Plant includes, from left, Frank Cooper, superintendent/chief operator; Hartmut Andrade, operator; and Nathaniel Munafo, assistant chief operator.

Cooper and his staff go out to the lagoons daily to take readings, and they see a variety of wildlife on every trip. "The lagoons are vibrant and full of life, and since we aerate, they don't totally freeze over in winter, and we get birds all year long," Cooper says.

The lagoons rest on a glacial till and have 40 years of solids at the bottom that act as a cake filter. Lining will be expensive, but some other solutions would be cost-prohibitive to the nearly 1,650 ratepayers of the seaside community.

"The lagoons are an active part of what we do, and the plant's got to have some overflow capacity," Cooper says. "I would prefer to keep all 20 acres, but from an economic standpoint, we may need to shrink them for lining in order to get our permit."



A great blue heron perches on a lagoon aeration line.

Snapping turtles, banded kingfishers, osprey and a family of otters are just some of the less typical critters that have thrived in the lagoons. Some residents of Marion even say the lineage of the remaining goats can be traced to early pilgrims in the area. Says Cooper, "What I know is that I'll be bummed if the lagoons go away." **tpo**

Headworks and Biosolids Management

By Craig Mandli

Aftermarket Parts/Service

AQUA OPERATIONS PROCESS CONTROL MONITORING PROGRAM

A process control monitoring program from Aqua Operations can help determine the concentration of BOD, TSS and other constituents in returned waste streams. The program can designate sampling locations for monitoring of the loading to various processes downstream of the introduction of each returned waste stream. If the returned streams are returned to the headworks downstream of the influent sampling, a process control sampling location should be determined to provide a representative sample of the actual facility loading to the primary clarifiers. The program can provide the actual biological and nutrient loading to a facility's processes, which is integral to proper facility operation. **888/746-6535; www.aquaoperations.com.**



Process control monitoring program from Aqua Operations



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Belt Filter/Rotary Presses

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The 1.7-meter, trailer-mounted belt filter press unit from Bright Technologies has an insulated control room with FRP walls, air conditioning, electric heat, a refrigerator, stainless steel desk, tool storage, locker, closed-circuit TV and remote operator controls. The



Belt filter press unit from Bright Technologies

modular design allows the room to be custom manufactured to fit most single-drop trailers. Units are made for rapid setup, with folding conveyor and operator walkways. No special lifting equipment is required. **800/253-0532; www.brightbeltpress.com.**



Belt filter press from Charter Machine

CHARTER MACHINE BELT FILTER PRESS

The belt filter press from Charter Machine fixes the steering roller on an independent beam that is then set on a center pivot point. That means when the steering cylinder is attached to one end and moves, both sides of the steering roller move, which means less belt stretching and more belt life — more than 4,000 hours. Less maintenance is required, leading to more consistent cake solids performance from even tensioning and belt stretching. This design is used on the entire line of thickening and dewatering equipment. **732/548-4400; www.chartermachine.com.**

Centrifuges/Separators

ALFA LAVAL ALDEC G3

The ALDEC G3 decanter centrifuge from Alfa Laval is designed to be easier to operate with improved process performance and environmental impact. Equipped with a 2Touch control package, it is easy to monitor, adjust and improve all the operating parameters to meet changing requirements, varying inputs and different conditions. The smaller conveyor diameter makes room for more liquid in the pond and allows higher bowl wall pressures, resulting in a 10 percent boost in processing capacity, or drier cake. Power Plates also effectively reduce the power consumption of the unit by as much as 40 percent. **866/253-2528; www.alfalaval.us.**



ALDEC G3 decanter centrifuge from Alfa Laval



THK hybrid thickening centrifuge from Centrisys Corporation

CENTRISYS CORPORATION THK HYBRID THICKENING CENTRIFUGE

The THK hybrid thickening centrifuge from Centrisys Corporation allows operators to decrease polymer consumption and increase capacity. Little to no polymer is required, leading to substantial savings for facilities in the waste activated sludge thickening process. Its hydraulic assist technology enables control of cake solids. It has a small footprint and is airtight and enclosed, eliminating odor issues. The unit has low maintenance requirements. **877/339-5496; www.centrisys.us.**

DRYCAKE DECANter CENTRIFUGE

DRYCAKE decanter centrifuges have an energy recovery hydraulic backdrive system built around EATON Duraforce hydraulic pumps and motors for maximum serviceability. The system is designed to maximize cake dryness by using the torque exerted on the scroll to drive the system. They have a heavy-duty flame-spray tungsten carbide implementation designed for abrasives. This heavy-duty flame spray offers an advantage over tiling in that scroll maintenance intervals are sufficiently increased



Decanter centrifuge from DRYCAKE

to be scheduled with rebalancing. Machines 20 inches and larger have the hydraulic lift-assist system that improves on the sectional cover design with a hydraulic jack to open and close the covers safely. Centrifuges come in bowl sizes up to 30 inches, in mobile and gastight configurations. **877/379-2253; www.drycake.com.**

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**KDS Separator from
Trident Processes**

Chemical/Polymer Feeding Equipment



**ADIN CO2 injection system from
AdEdge Water Technologies**

ADEGE WATER TECHNOLOGIES ADIN CO2 INJECTION SYSTEM

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water forms carbonic acid, a weak acid that immediately reacts with alkalis to reduce pH. As a gas, carbon dioxide is inert, noncorrosive and easy to store. With the use of the included monitoring equipment and injector, the control panel can be used in several different configurations to reduce pH. The automatic systems use a pH probe downstream of the system to regulate the amount of carbon dioxide being injected into the water. An injector and mixer are provided with all systems for optimal injection. A manifold and regulators are provided for carbon dioxide cylinders. **866/323-3343; www.adedgetechnologies.com.**

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**ProSeries-M M-4 peristaltic
metering pump from
Blue-White Industries**

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**VF-100 powdered
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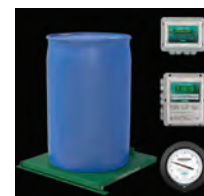
system has an injection check valve designed for ease of disassembly, inspection and cleaning, which elim-

inates a maintenance issue. **888/363-7886; www.dynablend.com.**

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Drumm-Scale from Force Flow

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**Polymaster polymer make-
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Chemical Pump Co.**

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Composting Equipment

BROWN BEAR CORPORATION SERIES R31

Series R31 paddle aerator attachments for sludge drying and aeration of compost windrows from Brown Bear Corporation can be used for accelerated drying of all types of potable water and wastewater biosolids, hydrocarbon-petrochemical biosolids, industrial and mining waste, and for aeration of compost windrows. The 31-inch-diameter



Series R31 paddle aerator attachments from Brown Bear Corporation

aerator provides a mechanical solution for accelerated air drying on pads and in drying beds, forming windrows, blending bulking agents or additives, pulverizing and aerating or water mixing for aerobic windrow composting. The rapid handling rate exposes the material to oxygen so noxious odors are minimized. It attaches to high-flow skid-steers and compact track loaders, and can be used with

flows up to 50 gpm and pressures up to 5,500 psi. It is available with a universal skid-steer hitch and in either 8- or 10-foot widths. 641/322-4220; www.brownbearcorp.com.

KUHN NORTH AMERICA KNIGHT VT VERTICAL MAXX

The Knight VT Vertical Maxx twin-auger mixer from Kuhn North America is available in four midsize trailer models in sizes from 320 to 680 cubic feet.



Knight VT Vertical Maxx twin-auger mixer from Kuhn North America

Truck model units are available in 440- to 680-cubic-foot capacities, with the 440-cubic-foot unit available in a stationary model. Improvements to the mixing chamber and redesigned augers provide aggressive processing of virtually all food waste materials, as well as efficient blending with other organic materials. Faster auger speeds result in improved auger clean-off and more complete clean-out of the mixer with each batch. The rugged, dependable drive system helps ensure reliable service and long life. Multiple discharge options offer increased versatility, and a variety of conveyor choices are available to match most discharging situations. 608/897-2131; www.kuhnnorthamerica.com.



Staggered Industrial Compost Series from Roto-Mix

ROTO-MIX STAGGERED INDUSTRIAL COMPOST SERIES

The Roto-Mix Staggered Industrial Compost Series comes with a GeneRation II Staggered Rotor, a rotary design that combines gentle tumbling with quick complete mixing to ensure rapid decomposition and quality compost. Ingredients are lifted up

to the side augers that move the material end to end for a fast, thorough mix. Total movement of material in the mixing chamber eliminates dead spots. The rotor lifts the material past the wedging point of the lower side auger, providing a fluffier mixture while lowering power requirements. The conveyor is used to build windrows or static piles. Units are available in 16.7-, 23-, 27.8- and 34.1-cubic-yard capacities as stationary, trailer or truck-mount units. 620/338-0090; www.rotomix.com.

Dewatering Equipment

AQUA-ZYME DISPOSAL SYSTEMS 30-YARD DEWATERING UNIT

The 30-yard dewatering unit from Aqua-Zyme Disposal Systems can be filled with 22,000 to 25,000 gallons of biosolids at 1 to 2 percent solids in about two hours. After draining 24 hours, the unit can be picked up using a standard capacity roll-off truck and transported for solids disposal. Biosolids volume can be reduced by 80 percent, with reductions to 98 percent in BOD, COD, FOG and TSS. The effluent is clear. The unit has



Dewatering unit from Aqua-Zyme Disposal Systems

few moving parts, and the size of the filter media can be selected to match job requirements. Standard equipment includes a roll-over tarp system; side, floor and center screens; 1/4-inch floor plate; 7-gauge side plates; four door binder ratchets; eight drain ports; two inlet ports; and long-handle scraper. Units have an average life span of 12 to 14 years. Units are also available in a 15-yard size. 979/245-5656; www.aqua-zyme.com.

IN THE ROUND DEWATERING HORIZONTAL DEWATERING DRUM

User-friendly horizontal dewatering drums from In The Round Dewatering are mounted on a powder-coated roll-off frame. The drum is constructed of stainless steel and lined with PVC filter tiles. The unit can dewater 18,000 to 25,000 gallons per fill and works overnight to separate liquids from solids. The drum provides consistent results with any material that will flock, including grease. Filling can be done multiple times prior to rotation, then the unit rotates one turn every two hours. The unit is energy-efficient, as it only requires 1/4 hp to operate. 317/539-7304; www.itrdewatering.com.



Dewatering drums from
In The Round Dewatering



Washer/compactor
from Schreiber

SCHREIBER WASHER/ COMPACTOR

The Schreiber washer/compactor washes out organics and dewater screenings in a batch sequence. Screenings enter the top of the unit and are agitated by a rotating shaftless screw in a trough being supplied with washwater. As the screw rotates in a forward and reverse motion providing agitation, entrained organic material is released from the screenings. The organics in suspension are drained back to the process stream for treatment by the process equipment. The washed screenings are transferred over a barrier at one end of the wash trough into the compactor section below. The screenings are subsequently dewatered by the action of a compactor screw, gravity and conical discharge, and then conveyed through a larger-diameter discharge pipe to a screenings container. The washed and compacted screenings material is significantly reduced in both volume and organics, resulting in disposal cost savings, and will pass the Paint Filter Test. 205/655-7466; www.schreiberwater.com.

WASTEQUIP DEWATERING CONTAINER

Dewatering containers from Wastequip separate liquids from solids, reducing the overall cost of waste disposal. They are ideal for wastewater treatment facilities, manufacturing facilities, spill sites, construction sites, refineries and mines, and can be custom configured for specific applications. To ensure no leaks, they undergo stringent hydro-testing and have a rear door with neoprene rubber or T-gaskets. Bolt-in, easy-to-remove liners are available. When removed, the container can be used for sludge containment. With a 1/4-inch floor, 7-gauge sides, all-continuous inside welds, solid steel nose cone and outside rail understructure, the containers are available in 20- or 25-cubic-yard sizes, with round bottom or rectangular configurations. Custom sizes are also available. 877/468-9278; www.wastequip.com. (continued)



Dewatering containers
from Wastequip

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BOERGER MULTICRUSHER

The Multicrusher twin-shaft grinder from Boerger is widely applicable for solids and debris-laden fluids. It grinds and crushes foreign objects like stringent materials, wood, plastics, fruits, textiles, etc., to ensure the trouble-free operation of downstream equipment. It homogenizes the medium, thereby facilitating the pumping process. It is available in five series, with throughput volumes up to 1,400 gpm. It incorporates the MIP design that allows for the quick and convenient replacement of all wetted parts without the removal of pipes. **612/435-7341; www.boerger.com.**



Multicrusher twin-shaft grinder from Boerger

VAUGHAN COMPANY TRITON



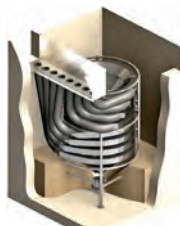
Triton screw centrifugal pumps from Vaughan Company

Triton screw centrifugal pumps from Vaughan Company handle thick biosolids, large or stringy solids, shear-sensitive fluids, and delicate or highly abrasive materials. They have non-overloading power characteristics, heavy-duty power frames and a flushless mechanical seal. A water-flushed mechanical seal or packing is available. **888/249-2467; www.chopperpumps.com.**

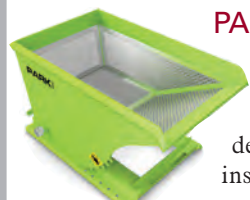
Grit Handling/Removal/Hauling

ENVIRODYNE SYSTEMS OCTOCELL

The OctoCell stacked-tray-type grit removal system from Envirodyne Systems reduces headloss and increases grit removal efficiency. Custom designs are available for all applications, including retrofits. It offers a small footprint, coarse to fine grit removal, and individual tentacles/hoses connected at the inlet for operator access and control. The flow path to each tray is the same size and length to better equalize pressure drops. Designs are available to engage/disengage trays automatically based on flow variations. Water and air scour lines or mechanical means can be supplied to fluidize the grit and further scrub organics. A variety of grit pumping options is available, including airlift, vacuum-primed and self-priming. **717/763-0500; www.enviordynesystems.com.**



OctoCell grit removal system from Envirodyne Systems



GritCat dewatering container from Park Process

PARK PROCESS GRITCAT

The GritCat from Park Process is a dewatering container designed to process waste streams containing gritty, sandy solids, or any type of non-deformable solids. Its filter media is permanently installed over porous support panels in the container and is reusable and cleanable. There are a variety of different types of filter media available, including stainless steel wire mesh, polyester woven material, nylon mesh and polypropylene monofilament. Applications are numerous in the industrial, municipal and oilfield markets, because it is a simple, easy to operate and maintain solids/liquid separation device. Units are built as roll-off containers, self-dumping hoppers or front loaders. **713/937-7602; www.parkprocess.com.**

PAXXO LONGOFILL

The Longofill continuous bag system from Paxxo can connect to the discharge point of machines used to move, dewater or compact screenings, grit and biosolids. Material is then deposited in a 90-meter-long continuous bag for odor containment and spillage control. The cassette bag is easy to seal, and the material and odors are trapped inside, cutting down development of bacteria and fungal spores. **770/502-0055; www.paxxo.us.**



Longofill continuous bag system from Paxxo

SMITH & LOVELESS OPTIFLOW 270 BAFFLE SYSTEM

The OPTIFLOW 270 baffle system from Smith & Loveless addresses the numerous 270-degree vortex grit chambers that are installed throughout North America and elsewhere. It is a simple retrofit baffle system that allows 270-degree grit systems to achieve improved removal efficiencies. Vortex grit removal systems designed to meet previous standards can be upgraded to remove 95 percent of grit down to 150 microns with the retrofit. The baffle system achieves improved efficiencies by directing the flow toward the hopper for an additional pass along the chamber floor, reducing the weir effect at the outlet and ensuring ideal velocities at all times. The retrofit system is available not only for flat-floor vortex grit chambers, but also as a conversion system for sloped and cone-shaped grit chambers. It can be installed for new systems requiring 270-degree layouts. **800/898-9122; www.smithandloveless.com.**



OPTIFLOW 270 baffle system from Smith & Loveless

Headworks

CONVEYOR COMPONENTS COMPANY MODEL RS

The Model RS pull cord from Conveyor Components Company is a rugged safety stop control that provides a quick positive shut-off of dangerous equipment in emergencies. It is triggered by a cable pulled by endangered personnel. The outputs can control up to four separate circuits, depending on the model chosen. These alarms can include one for machinery shutdown and one for alarm. It was developed to meet the stringent requirements of safety agencies throughout the world. This control is designed to act as an emergency stop for conveyors and other moving machinery. The standard housing construction is corrosion-resistant cast aluminum, with an optional polyester or epoxy powder coating. The operating handle must be manually reset after the problem has been corrected. **810/679-4211; www.conveyorcomponents.com.**



Model RS pull cord from Conveyor Components Company

HYDRA-TECH PUMPS S6T



S6T trash pump from Hydra-Tech Pumps

The S6T 6-inch hydraulic submersible trash pump from Hydra-Tech Pumps is lightweight, compact and able to pass large solids and stringy materials. This versatile top discharge pump is designed for sewer bypass jobs, digester cleaning, plant intake desilting and inline pumping. It handles hydraulic inputs up to 30 gpm at pressures to 3,000 psi, and will continue to move water at heads up to 120 feet. Beyond water, it can handle semi-solids measuring up to 5 inches. The pump volute and impeller are cast aluminum, and other component parts are precision-machined stainless or carbon steel. **570/645-3779; www.hydra-tech.com.**

OSTARA NUTRIENT RECOVERY TECHNOLOGIES PEARL PROCESS

The Pearl Process from Ostara Nutrient Recovery Technologies resolves struvite issues and provides a comprehensive approach to nutrient management. It is based on controlled chemical precipitation in a fluidized bed reactor that recovers struvite in the form of highly pure crystalline pellets or prills. Nutrient-rich feed streams are mixed with magnesium chloride and, if necessary, sodium hydroxide and then fed into the reactor, where minute particles or struvite seeds begin to form. Like a pearl, these seeds grow in diameter until they reach the desired size – 0.9 to 3.0 mm – which is precisely controlled by varying key parameters. In a municipal wastewater treatment plant, up to 85 percent of the phosphorus and 40 percent of the ammonia load is removed using this process, recovering the phosphorus for reuse as an eco-friendly fertilizer, marketed as Crystal Green. Implementation results in reduced chemical dependency, reduced biosolids production, increased plant efficiency and the creation of a new revenue stream for the plant. 604/408-6697; www.ostara.com.



Pearl Process from Ostara Nutrient Recovery Technologies

SEEPLEX PROGRESSIVE CAVITY PUMP



Progressive cavity pumps from SEEPLEX

SEEPLEX progressive cavity pumps equipped with the Smart Conveying Technology design have quick maintenance, short downtimes, energy efficiency and low life cycle costs. They will convey media for virtually all industries and handle conveying capacities up to 500 gpm and pressures up to 120 psi. 937/864-7150; www.seepex.com.

Septage Receiving Stations

SCREENCO SYSTEMS MEGA SCREEN

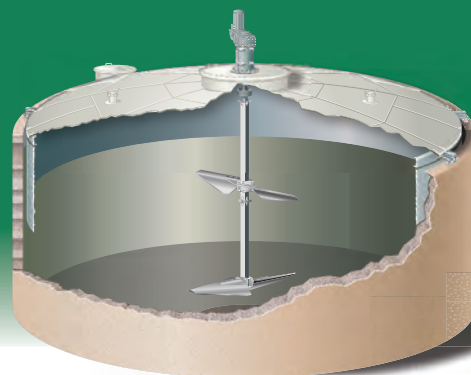
The Mega Screen septic receiving station from Screenco Systems has 40.5 square feet of screening area, fed by a 6-inch inlet with dual fan spreaders. The front screens are virtually self-cleaning, processing up to 1,000 gpm. The dual screen design is non-mechanical and uses gravity to separate trash from the waste stream. The unit is constructed from aluminum with stainless steel 3/8-inch-gapped bar screens on opposing angles, meeting the 503 regulations for septic screening. It can be set up with a single 6-inch inlet hose or two 4-inch inlet hoses capable of off-loading two trucks simultaneously. It will not plug with rags or hair, and simple raking to the trash drain tray with the custom tools provided makes for a simple clean-out. Built-in forklift skids make it portable, allowing for setup virtually anywhere. An OSHA-compliant catwalk is included. 208/790-8770; www.screenco.com.



Mega Screen septic receiving station from Screenco Systems

(continued)

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The Perforated Plate Millennial fixed-element perforated screen from Duperon Corporation provides absolute protection for downstream processes. Active Hydropression technology requires no brushes and eliminates carryover, stapling and blinding, while incorporating FlexLink technology. It has no seals, eliminating dynamic seal failure. 800/383-8479; www.duperon.com.



Perforated Plate Millennial screen from Duperon Corporation



SAVI Flo-Drum Screen from Enviro-Care Company

ENVIRO-CARE COMPANY SAVI FLO-DRUM SCREEN

The Enviro-Care Company SAVI Flo-Drum Screen with a 2 mm perforated opening has a proven capture rate of 86 percent as verified by UK-WIR testing in 2015. A triple-face seal is the first barrier to incoming solids in the flow. The labyrinth seal prevents even small solids and hair from bypassing the screen. As the drum rotates, solids are captured on the interior of the drum and collected by strategically placed scoops that deposit the solids into the conveyor trough, where they are moved to discharge. A brush and spray on the exterior of the drum keep even the smallest solids inside the perforated drum.

815/636-8306; www.enviro-care.com.

TERGO ENVIRONMENTAL FOG XTRACTOR

The FOG Xtractor from Tergo Environmental is gravitational grease separation equipment that uses Btu from brown grease, eliminating energy costs. Benefits include increased cycle speed (processing up to 80,000 gpd of grease), no use of additives or chemicals, and a low operating cost. It can help eliminate downtime and maintenance costs associated with grease trap waste receiving. The superior-quality brown grease extracted from the unit is used to fuel the FOG Xtractor burners as well as used to enhance methane production in anaerobic digesters or sold to enhance a bottom line. Available in small, medium and large, the unit can scale to any operation in the private or public sectors. 941/549-4971; www.fogxtractor.com.



FOG Xtractor from Tergo Environmental



CleanFlo monoscreen from WesTech

WESTECH CLEANFLO MONOSCREEN

The WesTech CleanFlo monoscreen is an efficient, self-cleaning fine screen that is used in a wide variety of wastewater and process water treatment applications. Using a blade and drive system, it creates a progressive step motion that allows the screenings to be evenly distributed while minimizing water level surges. The result is a screenings capture ratio of 82.5 percent. When matched with a CleanWash SWP/CPS dewatering unit, the combination maximizes the solids capture rate for almost any head-

works operation, while minimizing the amount of solids for disposal. 801/265-1000; www.westech-inc.com.

Biosolids Handling/Hauling/Disposal/Application

JDV EQUIPMENT LEVEL LODOR

The LEVEL LODOR cover system from JDV Equipment helps contain odors by covering standard dump containers used for hauling processed material. The design allows for even distribution, increasing the fill percentage without manually evening out material. Enclosing containers allows outdoor installation without exposing material to the environment or pests. 973/366-6556; www.jdvequipment.com.



LEVEL LODOR cover system from JDV Equipment



Raptor pretreatment systems from Lakeside Equipment Corporation

LAKESIDE EQUIPMENT CORPORATION RAPTOR

Raptor septage acceptance plant and septage complete plant pretreatment systems from Lakeside Equipment Corporation can help manage the unloading process and protect downstream equipment. The system's security access and hauler management and accounting software provide municipalities with the tools to maximize revenue generation and produce more energy with a minimum of maintenance. 630/837-5640; www.lakeside-equipment.com.

LYSTEK INTERNATIONAL THERMAL HYDROLYSIS SYSTEM

The thermal hydrolysis system from Lystek International optimizes digesters and biological nutrient removal systems, contributing to diversion and sustainability. Nonhazardous materials are transformed into nutrient-rich, federally recognized biofertilizers and other multipurpose products. High-speed shearing, alkali and low-pressure steam are applied simultaneously in a reactor to convert organic materials into LysteGro, a commercial-grade, Class A EQ bio-fertilizer with applications in horticulture, agriculture and soil revitalization. The end product can also be used as a safe, cost-effective, alternative carbon source (LysteCarb) in BNR systems. When used in conjunction with anaerobic digestion (LysteMize), the system can reduce volumes by 25 percent while boosting biogas production by 40 percent. The biogas can then be converted into green energy to help power wastewater treatment plants. 888/501-6508; www.lystek.com. tpo



Thermal hydrolysis system from Lystek International

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- ☐ Bionetix International Micro 14 micronutrient blend

Composting Equipment

- ☐ Brown Bear Corporation Series R31 paddle aerator attachments
- ☐ Kuhn North America Knight VT Vertical Maxx twin-auger mixer
- ☐ Roto-Mix Staggered Industrial Compost Series

Dewatering Equipment

- ☐ AQUA-Zyme Disposal Systems 30-yard dewatering unit
- ☐ In The Round Dewatering horizontal dewatering drum
- ☐ Schreiber washer/compactor
- ☐ Wastequip dewatering container

Grinders/Shredders

- ☐ Boerger Multicrusher grinder
- ☐ Vaughan Company Triton screw centrifugal pumps

Grit Handling/Removal/Hauling

- ☐ Envirodyne Systems OctoCell grit removal system
- ☐ Park Process GritCat dewatering container
- ☐ Paxxo Longofill continuous bag system
- ☐ Smith & Loveless OPTIFLOW 270 baffle system

Headworks

- ☐ Conveyor Components Company Model RS pull cord
- ☐ Hydra-Tech Pumps S6T trash pump

- ☐ Ostara Nutrient Recovery Technologies Pearl Process
- ☐ SEEPEX progressive cavity pump

Septage Receiving Stations

- ☐ Screenco Systems Mega Screen

Screening Systems

- ☐ Duperon Corporation Perforated Plate Millennial screen
- ☐ Enviro-Care Company SAVI Flo-Drum Screen
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00816

Wet well system curbs odor issues

Problem

In mid-2013, the Pacific Northwest Regional Wastewater Authority was receiving odor complaints from residents around a lift station and was experiencing odors in the plant as well.

Solution

Anue Water Technologies conducted a demonstration of **ozone and oxygen treatment** at the lift station. Data collection showed that the odors were most likely due to mercaptans. Ozone and oxygen treatment were delivered through two HydroSpear conditioning heads in the wet well at the lift station. The odors at the lift station soon vanished, and odor at the plant decreased markedly. Based on the results, the authority installed a Phantom FLD-60-15-H wet well system to deliver continuous ozone and oxygen treatment.



RESULT

The system has provided the same level of odor abatement as the demonstration system since startup. A benefit of reduced odor at the plant is less blower runtime, saving \$2,000 to \$3,000 per month on energy. 760/727-2683; www.anuewater.com.

Golf course treatment facility solves debris-screening problem

Problem

The Olde Atlanta Club's Wastewater Treatment Facility in Suwanee, Georgia, had an aging wastewater treatment plant protected by original rotary screen assemblies that failed to intercept gritty material. Garrett Gladstone, operator in charge, needed an affordable solution.

Solution

The team chose **Drumtec** from **Aqualitec**. The system is internally fed, making it well suited to remove rocks, grit, organics, wipes, rags and fibers. Operators added a Compactec system that conveys and dewater waste material and reduces waste volume.



RESULT

"Drumtec catches nearly all the debris that enters the treatment plant," Gladstone says. "And Compactec compacts the material so well that we now use a smaller dump container, while getting rid of more debris than before. Without all the extra material getting into the aeration basins, the treatment process operates much more efficiently." Operators don't need to clean the basins nearly as often, and a foam problem has disappeared. 855/650-2214; www.aqualitec.com.

Rotary press efficient in dewatering ash slurry

Problem

The T.Z. Osborne Water Reclamation Facility in Greensboro, North Carolina, produces ash slurry from its incinerator that requires dewatering.

Solution

The facility selected a **rotary press** from **Fournier Industries** because it worked well with the polymer that was already used at the plant. The capture rate during testing was 90 percent. The press was installed in March 2016.



RESULT

Ash slurry is sent to the press at 1 percent solids and dry cake in the range of 50 percent solids is produced. The rotary press is operating well and the staff is looking at the unit for treatment of pre-incineration sludge. 418/423-6912; www.rotary-press.com.

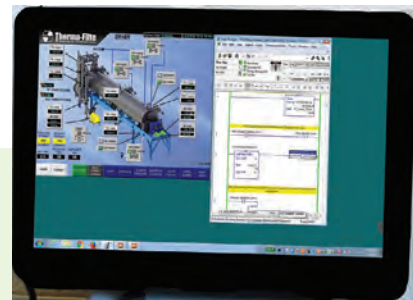
Plant improves process quality and uptime with mobile app

Problem

The Rio Dell (California) Wastewater Treatment Plant wanted to upgrade its biosolids management program.

Solution

The plant's **Therma-Flite BIO-SCRU dryer** came with software allowing the manufacturer's service team and the plant operator to modify the biosolids drying process. Rio Dell purchased Therma-Logic Connect service, which allows company service technicians to make remote adjustments to temperature, process rate and other parameters. "Therma-Flite's technician programmed warnings based on certain conditions, which automatically send notifications to my mobile device when the conditions change," says Rick Chicora, operator. "The majority of warnings I can handle right then from my mobile device. If the warning requires my Therma-Flite technician, I call or text him. He can access our dryer software from wherever he is. The issue gets fixed and I avoid a service visit."



RESULT

Running since December 2015, the service has improved uptime and overall process time by monitoring conditions and resolving issues before they become significant. The service deploys within 24 to 48 hours and works anywhere with a tablet provided by Therma-Flite and an internet connection. The plant receives regular data review and efficiency monitoring, real-time condition monitoring and diagnostics and automatic upgrades as they become available. 707/747-5949; www.therma-flite.com.

Bar screens used to replace catenary-type screens

Problem

The old screens at the Glenbard (Illinois) Wastewater Treatment Plant had not functioned properly since 1999. Because this plant handles both wastewater and stormwater, flows range from 3 mgd to over 40 mgd. The lower flows often result in channel-clogging floatables and sediment.

Solution

MS Bar Screens from **Headworks International** were installed in 2004. They are designed to significantly reduce debris in downstream processes.

RESULT

The cleaning cycle has been reduced by more than half. "We have had some of the highest flow periods seen in 20 years and it performed flawlessly," says Erik Lanhier, wastewater authority manager. "Other than routine maintenance, we did not have to touch the screen during the first year of operation." Blinding on the screening field has not occurred. When Hurricane Ike dropped 101 billion gallons of water on Cook County, just one screen handled the deluge. 713/647-6667; www.headworksintl.com.



Bioset Process helps convert biosolids to commercial fertilizer product

Problem

The City of Orlando, Florida, has been moving away from land application of Class B biosolids. While investigating an experimental biosolids oxidation technology, the city delayed renovations to the anaerobic digesters at its Conserv II Water Reclamation Facility. After commercialization of the oxidation technology was delayed, the city began plant improvements.

Solution

An engineer estimated a \$40 million cost for a Class A thermophilic anaerobic digestion system with sidestream treatment and combined heat and power. Convinced that the marketplace would deliver breakthrough biosolids treatment technology, the city sought an alternative to cover the next five to 10 years. The city installed the **Schwing Bioset lime stabilization process** as a way to produce a commercial fertilizer product.

RESULT

The Bioset equipment was installed in spring 2016. Schwing Bioset's sister company, Biosolids Distribution Services, which manages Class AA fertilizer-grade biosolids in the Florida, manages the biosolids from the Orlando Bioset process. 715/247-3433; www.schwingbioset.com.



Grit washer reduces disposal costs for plant

Problem

La Crosse Wastewater in western Wisconsin wanted to make its treatment processes more efficient and effective. Because of the odor, hazardous content and sheer weight of grit, disposal fees were quite significant. The utility looked for a grit washing system that would reduce cost and integrate with its automated plant operations.

Solution

The automated **COANDA Grit Washer RoSF 4** from **Huber Technology** reduced the hauling of 125 tons of grit at \$65 per yard, saving \$7,530 per year. The system yields sandbox-grade grit while returning organics to the treatment process. The clean grit is popular for landscaping, and the organics are now used for cover at the city's landfill.



RESULT

Fees were reduced by 79 percent. The grit washer requires little attention from maintenance staff and rare intervention from Huber's support team. 704/949-1010; www.huberforum.net.

Plant finds solution for land application of effluent water

Problem

In the city of Fayetteville, Arkansas, the Noland Wastewater Treatment Plant is located adjacent to the Midland Bermuda production area, which produces 230 tons of forage grass per year that is sold to local residents and farmers. The treatment plant has a 670-acre nutrient water reuse site. The plant mitigates up to 12.6 mgd of effluent water to be reused on the growing crops, but they needed a way to distribute the effluent water to the crops.

Solution

The plant purchased a total of four **T40x1250 Water-Reels** from **Kifco**. They are ideal for the reuse of nutrient water, applying the water with uniformity and reducing compaction of soil associated with tanker trucks. The units were equipped with an optional hydraulic turntable, hydraulic jack and five-wheel gun cart to decrease operating cost. They can distribute wastewater with up to 3 percent solids.



SOLUTION

The Water-Reels have effectively distributed the effluent water to the crops. 800/452-7017; www.kifco.com.

(continued)

Rotary drum thickener increases solids output, reduces moving parts for sanitary district

Problem

The Sanitary District of Decatur, Illinois, had an aging dissolved air flotation thickening (DAFT) system that was not producing the thickened solids required by the digester. Solids content was 3 to 3.5 percent. Requirements also called for a reduction in moving parts on the next equipment installation.

Solution

The district installed three **ThickTech rotary drum thickeners** from **Parkson Corp.** taking up one-third of the footprint of the original units and containing far fewer moving parts.



RESULT

The district has increased the thickened solids content to 5.5 to 6 percent, reduced chemical costs and achieved its goal of a lower-maintenance system. **888/727-5766; www.parkson.com.**

Three-tank continuous sludge system efficiently pasteurizes digestate

Problem

Muntions PLC in Stowmarket, England, pasteurizes 80,000 tons per year of liquid malt sludge at its plant while coping with noncontinuous flow of biosolids. The system must meet BSI PAS 110, a British Specification for digestate similar to U.S. EPA Code of Federal Regulations, Title 40, Part 503 Class A.

Solution

The company installed a **Three-Tank Continuous Sludge Pasteurization System** from **HRS Heat Exchangers**. The system has an energy recovery section that transfers energy from the pasteurized biosolids to the unpasteurized biosolids, reducing energy consumption by up to 70 percent. A final heat exchanger uses water from the combined heat and power engine. Three tanks have several level/temperature probes so that the tanks can be filled to different capacities, allowing continuous and flexible production of digestate. A pump package and a control panel complete the system.



RESULT

The system efficiently pasteurizes the biosolids using 40 percent less energy. It runs continuously even when digestate stocks fluctuate, and tracks, traces and electronically reports data on digestate processed. The system reduced total cost of ownership, fits the space at the plant site, and saves 1,159 tons of carbon dioxide per year, the emission equivalent of 300 cars. **623/915-4328; www.hrs-heatexchangers.com.**

Vertical conveyors aid in increasing biosolids incineration potential

Problem

The merchant biosolids incineration facility in Naugatuck, Connecticut, receives dewatered biosolids from New York, Connecticut and Maine. Its progressive cavity pumps could not handle the wide range of solids consistencies and foreign objects in the material. The plant could process only three to four truckloads per day, and frequent blockages and break-downs drove up maintenance costs.



Solution

The facility selected **SPIRAC vertical conveyors and live bottoms**. Imported biosolids are now mixed with materials dewatered on site in a receiving bunker and transported to the incineration feed silo.

RESULT

Production is consistently 12 to 14 truckloads per day (maximum licensed capacity). The high-capacity conveyors run at less than 50 percent duty. Over six years, maintenance has been minimal and downtime nearly eliminated. **770/632-9833; www.spirac.com.**

Grinding unit effectively replaces channel grinders

Problem

The Monterey Regional Water Pollution Control Agency in northern California was having a problem with channel grinders in 10 pump stations. The units were constantly breaking down and needing to be rebuilt.

Solution

"When we heard about the stack cutter assembly in **Franklin Miller's DIMMINUTOR**, we wanted to learn more," says Bret Boatman, maintenance supervisor. "The fact that the device has no bottom bearings was very attractive." The device automatically screens and grinds solids with a straight-through open channel design. It reduces plastics, wood, vegetable matter, disposables and other items to a fine particulate.



RESULT

"We have so much less downtime and maintenance costs on the new machines," says Boatman. The plant has switched out eight of its old units. **800/932-0599; www.franklinmiller.com.**

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Grinder keeps waste flowing at amphitheatre

Problem

Concertgoers flocking to Red Rocks Amphitheatre and the surrounding Red Rocks Park District in Colorado increased loading to the wastewater treatment system. Huge amounts of clothing, rocks, wipes and rags clogged the drum grinders in the wastewater vaults daily, making it difficult to properly shred the debris. Replacing equipment in the water tanks annually was costly, and drum cleaning required three hours of manual labor.

Solution

MISCOwater, a local provider of wastewater processing equipment, recommended the **Muffin Monster** from **JWC Environmental** for its ruggedness and durability in breaking down wipes and other non-dispersibles.



RESULT

Since installation in the facility's first wastewater vault, debris has been captured and cut before traveling to the aerators. Crews no longer perform maintenance, remove clogs or replace water tank equipment. 800/331-2277; www.jwce.com. tpo

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Finding Phosphorus

THERE ARE MORE WAYS TO KEEP PHOSPHORUS OUT OF WATERWAYS THAN ADDING NEW PROCESSES. ADAPTIVE MANAGEMENT AND NUTRIENT TRADING LOOK TO LIMIT RUNOFF FROM UPSTREAM SOURCES.

By Ted J. Rulseh

Clean-water plants facing tough new permit limits on phosphorus increasingly look upstream. Some states allow innovative methods for phosphorus reduction in waterways that don't necessarily involve costly new treatment processes or plant upgrades.

Wisconsin's regulations, for example, allow adaptive management: A clean-water agency can work with property owners upstream to limit phosphorus runoff, instead of or in addition to cutting its own phosphorus discharges.

Another approach is nutrient trading, a market-based approach in which facilities can come into compliance by buying and selling rights to emit phosphorus. Such approaches have worked well in, for example, curtailing the air pollutants that cause acid rain.

John Nelson, a project manager with The Nature Conservancy, has worked on phosphorus reduction in some watersheds in eastern Wisconsin and has advised clean-water agencies looking at innovative approaches. In an interview with *Treatment Plant Operator*, he shared ideas on how agencies can go about finding opportunities for phosphorus reduction on farms.

tpo: What role has The Nature Conservancy been playing in phosphorus reduction in watersheds?

Nelson: We initially worked on a project in Wisconsin in which we compared a small test watershed, where we wanted to ask farmers to change practices, against a control watershed, where farmers were not asked to change. We looked at land use in both watersheds and came up with targeted efforts on a small percentage of the land base. We believe, and it's pretty well proven, that a small percentage of fields actually contribute the most phosphorus runoff. Why invest money across an entire watershed? Why not target it where it will have the most effect?

“Trust is important, especially with farmers. It takes a while to develop that trust and show that everybody is trying to work toward one goal of a better society.”

JOHN NELSON

tpo: What work have you done with municipalities to reduce upstream phosphorus contributions?

Nelson: The City of Plymouth, Wisconsin, approached us asking whether we could help them with phosphorus reduction. In working with them, we're trying to build a model of how a municipality would approach looking for nutrient credits in a watershed. We're using some of the same reasoning as in our original test and control watersheds, trying to find the hotspots.

tpo: How can a clean-water agency work with these innovative phosphorus reduction approaches?

Nelson: There are three basic ways it can be done. First, they could

simply make sure the stream they discharge to meets the state standard for phosphorus. They would work toward that by helping clean up runoff problems on farms. Second, they could trade for credits in the watershed, either with a private landowner — a farmer in most cases — or with another facility on the same stream that is operating well below its discharge limit. A third way that the U.S. EPA is now reviewing would allow a city to pay a fee for each pound of phosphorus above its limit. That money then could be used by an entity such as a county land and water conservation department to pay for general improvements in the watershed.



John Nelson

tpo: Based on your experience, what advice would you give to clean-water operators looking upstream to reduce phosphorus?

Nelson: A first step would be to go to the county land and water conservation department and talk to the field staff to get an idea what the potential is for reducing phosphorus. Then, most communities would likely hire a consultant to get details in terms of comparing the cost of a plant upgrade to going out and buying credits. Generally, you would expect buying credits to be cheaper, but that may not always be true. It depends on the condition of the watershed. If the farming practices are already good, there may not be a lot of credits to be had.

tpo: Are there other simple ways to investigate farming practices in a watershed?

Nelson: Another easy way to start is to look at aerial photos of a township. You can pick out concentrated flow areas where there is a lot of erosion. It's not terribly difficult to get a general idea. If you want to get really hard numbers, you have to go to the farms and do measurements of soil phosphorus levels and actually look at the farming practices.

tpo: What about analytical tools for assessing risk of phosphorus runoff?

Nelson: Wisconsin has the SNAP-Plus soil nutrient application planner. It's a model developed by the University of Wisconsin Soil Sciences Department. You enter variables like the soil type, the slope, presence or absence of streamside buffers, and farming practices such as moldboard versus chisel plowing. The model calculates a phosphorus index value for each field that measures the risk of phosphorus moving across that field into a waterway.

tpo: Who would actually deploy this model?

Nelson: It could be a crop consultant hired by a farmer. It could be county land and water conservation staff. It could be the farmers themselves. Farmers have the ability to write nutrient management plans based on the SNAP-Plus model. Some are quite adept at using the technology.

tpo: In general, what do you observe today about the quality of farming practices in terms of limiting runoff to creeks and rivers?

Nelson: Farming practices have improved a lot. I suspect most farmers who were the biggest problems probably are no longer in business. The big dairies — the concentrated animal feeding operations (CAFOs) — are under stringent rules. Smaller farms see less scrutiny, although they have rules to follow as well. There is still a lot of room for improvement, but we're encouraged. Things we promote, such as cover crops, that benefit water quality also benefit farmers in the long run. To sustain a good farming living, they need healthy soil. They know that.

tpo: Who decides how much phosphorus credits are worth?

Nelson: The Wisconsin Department of Natural Resources has some standards published in its nutrient trading handbook. In the end it depends on what practices the farmer installs. If a city were to get a farmer to make a change, the city would likely pay the farmer for whatever was done. It might be an annual cost, or it might be an annual contract. It varies greatly.

tpo: Would you see that searching for credits and encouraging farmers to change practices would be outside the core competency of a typical clean-water agency?

Nelson: I'm not sure that is true. I think operators can pretty easily understand the process. I think the team in Plymouth is anxious to get going. They have hired a consultant to help them evaluate their best options.

tpo: Can anything be done within a city's borders to reduce phosphorus runoff?

Nelson: Absolutely. There are practices like installing stormwater retention ponds and sweeping streets to keeping leaves out of storm drains.

tpo: What kinds of farming practices can be employed to reduce phosphorus?

Nelson: Besides planting cover crops and stream buffers, they can change their crop rotations. Suppose a farmer plants corn for two years and soybeans for a year after that. If he added a year of winter wheat to the rotation, that could help. Farmers in some areas could go with no-till planting. For applying fertilizer, some farmers put it in a band next to the seedbed instead of broadcasting it across the field. They get more benefit from the fertilizer they use.

tpo: What about improving manure management?

Nelson: Manure management is huge, and farmers are getting better at it. They have better techniques for putting it on. Some apply a cover crop seed along with the manure, so the plants can grab a hold of some of the nutrients and hold them there until spring. There are different ways of applying manure so that it's less likely to run off.

tpo: Is there a human side to this approach to phosphorus management? How important is communication as part of the process?

Nelson: It's very important for a community using this approach to let anyone who could be affected know what's going on. Don't hide the plans until the last minute. Keep people informed. That includes town governments. Trust is important, especially with farmers. It takes a while to develop that trust and show that everybody is trying to work toward one goal of a better society. Take the attitude that everybody can come out a winner. **tpo**

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The MicroFlow microwave-based, non-contacting velocity sensor from Pulsar Process Measurement mounts above a channel for maintenance-free, reliable, repeatable and accurate velocity measurement. The sensor provides an alternative to a channel restriction such as a flume and a viable solution in situations where system hydraulics do not permit the installation of any primary measurement device. **850/279-4882; www.pulsar-pm.com.**

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The Series 795 inline maintenance knife gate valve from Victaulic simplifies installation and maintenance, reduces downtime and improves worker safety. Designed for fluid lines containing solids or abrasive materials common in wastewater treatment, the valve can reduce maintenance downtime by up to 95 percent and generate up to 60 percent savings in annual maintenance costs. Victaulic developed advanced technology that encloses all wear parts into a single-seat cartridge kit that simplifies maintenance. The valve joins either grooved end carbon steel or plain end HDPE pipe. It is available in sizes 3-12 inches and rated to 150 psi. **610/559-3300; www.victaulic.com.**

5. BLUE-WHITE PERISTALTIC METERING PUMP

FLEXFLO peristaltic pumps from Blue-White Industries are designed for abrasive, thick and gaseous fluids that can foul conventional metering pumps. Self priming and valveless, the pumps feature tube failure detection (TFD) to keep operators and pump rooms safe from spills. If noncompatible chemicals are detected in the head, the pump automatically shuts off and will not restart until the chemical has been removed. Other features include feed output to 5.17 gph and working pressures to 1,000 psi. Digital models accept 4-20mA, 0-10VDC and pulse inputs for speed control and one amp alarm output relay. **714/893-8529; www.blue-white.com.**

6. WATSON-MARLOW PERISTALTIC CASED PUMP

Model 530 peristaltic cased pumps from Watson-Marlow Fluid Technology Group are designed for metering and transfer applications such as surface coating, printing and lime addition. Built to operate 24/7 without interruption, features include a bright color display, intuitive menu and two-way, real-time communications with increased diagnostic capability and faster response. Available with four drive options and nine pump head variants, the pumps deliver flow rates from 0.000026 gpm to 0.92 gpm and can be fitted with continuous tubing pump heads or LoadSure tube element pump heads for pressures up to 101.5 psi. **800/282-8823; www.watson-marlow.com.**

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Ventis Pro Series multi-gas monitors from Industrial Scientific are small, rugged, highly configurable and feature sensor options to detect up to five gases. iAssign technology tracks users and sites in real time using Near Field Communication (NFC) to help safety managers identify and address job site gas hazards and improve asset management. A dedicated panic button and man-down alarm help to alert nearby workers when someone is in distress or has lost consciousness. Acknowledgeable gas alerts let users know when they are in the presence of gas below the low alarm level, enabling them to take safety precautions while continuing to work. Alarm action messages provide written instructions during low and high alarm events, helping workers to react appropriately. **412/788-4353; www.indsci.com.**

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8. NOV TURBULENT FLOW STATIC MIXER

The Kenics UltraTab static mixer from NOV is designed for turbulent flow applications where a high degree of mixing is required in a compact space. Available in sizes from 2 to 60 inches and additive ratios from 1-to-3 to greater than 1-to-10,000, the mixer features NPT or flanged injectors. Material options include carbon steel, stainless steel, coated carbon/316 stainless steel, FRP and high-alloy metals. Configuration options include multi-injection ports, spool piece with flanged or welded prep ends and element extension for lower CoV requirement. **281/854-0300; www.nov.com.**

9. REO-USA WASTEWATER TREATMENT FACILITY DC POWER SUPPLY

The REOTRON SMP Series DC power supply from REO-USA can be used anywhere a steady DC supply is required. The power supplies are primarily devices with galvanic separation from the input to the output. They can be utilized as voltage, current or power regulators. Output can be manually adjusted up or down, and match the current required to keep any or all units operating at optimal protective levels. The devices are air or water-cooled and have a small footprint, with a 19-inch rackmount chassis or a compact panel-mount chassis available. They can be delivered as an installation-ready control cabinet or as a tabletop unit. Available units include DC output, phase angle control of external rectifier pulses, single- and three-phase AC, and two-stage AC output. **317/899-1395; www.reo-usa.com.**

(continued)

wastewater: product spotlight

Smith & Loveless Everlast above-grade pump station offers easy access

By Ed Wodalski

The **Everlast above-grade pump station** from **Smith & Loveless** is housed above and outside the wet well, making operator maintenance safer, simpler and more economical.

Designed to handle up to 3-inch solids, features include the Duro-Last stainless steel baseplate, Quicksmart touch-screen station controls, X-Peller non-clog impeller and RapidJack quick-clean check valve, which enables operators to access the check valve by removing four bolts, and be up and running within 10 to 15 minutes.

"One of the unique things about the pump station is it's installed right at ground level," says William Flores, vice president of municipal systems, Smith & Loveless. "All the pump station equipment is outside of the confined space wet well. It saves time inspecting and maintaining the pump station."

For safety purposes, submersible pump stations often require two or three people to perform an inspection.

"With ours, you can send just one employee, which saves on labor hours," Flores says.

Because of its X-Peller feature, the above-ground pump station easily handles flushable, disposable wipes.

"It's a single-port impeller so there's no plugging," Flores says. "Everything goes straight through the pump. You don't have to go on a daily basis and remove the submersible station, remove the pump, unclog it and put it back in service."

The Quicksmart PLC control system enables users to track amperage and input/output status and receive text alerts for high water levels.

"Operators can easily pinpoint a problem by just looking at the touch



Everlast pump station from Smith & Loveless

screen. You can remotely be in your truck visiting one station and communicating with another," Flores says of the system that includes maintenance reminders.

The pump station is available in four specialized models, from the Series 5000 high-capacity (4- to 10-inch pipes, up to 3,000 gpm and heads to 255 feet) to the high-capacity Capsular for 4- to 30-inch piping, up to 12,500 gpm flows and up to 350 feet of head. Also available are the Series Hi-Head with four S&L pumps in series (up to 1,300 gpm and 316 feet of head) and the Triplex higher-capacity/flex station with three pumps that deliver up to 2,600 gpm and 158 feet of head. Both the Hi-Head and Triplex models are designed for 4- to 6-inch piping.

"A lot of the stations we manufacture these days have the Duro-Last stainless steel baseplate, which is one of the most popular options," Flores says. "Under the pump you have gases from the wet well. Historically, manufacturers have used epoxy-coated steel baseplates and over time the gases will start chipping the paint. The Duro-Last baseplate prevents that from happening." **800/898-9122; www.smithandloveless.com.**



10. XYLEM BIOGAS SUPPORT SYSTEM FOR SUBMERSIBLE MIXERS

The Flygt BIS 1 biogas support system from Xylem, specially adapted for the wall mounting of submersible mixers in biogas digesters, is designed to ensure process optimization, reliability and safety — as well as holding the mixer in place throughout its use. The system is equipped with a patented guide bar connection that guarantees a secure and durable guide bar connection, minimizing vibration and thereby maximizing system longevity. The corrosion- and abrasion-resistant system also features an intermediate support that enables a mixer to pass over an intermediate wall bracket smoothly without obstruction. **855/995-4261; www.flygtus.com.**

11. BIONOMIC INDUSTRIES STORAGE TANK VENT CLEANING SYSTEM

The VentClean scrubber system from Bionomic Industries is available in four model sizes to handle gas capacities from 0 to 1,500 acfm, and Type 1 and Type 2 operating configurations. Features include corrosion-resistant construction and low-pressure scrubber design to avoid dangerous over-pressurization of fiberglass and plastic storage tanks. **800/311-6767; www.bionomicind.com.**

12. PROTECTIVE INDUSTRIAL PRODUCTS FALCON PROTECTIVE GEAR

Falcon rainwear and liquid splash protection gear from Protective Industrial Products (PIP) are designed to help shield against liquid splashes and contaminants, defend against heavy rain, and provide splash protection for industrial pressure washing applications. Falcon products include ChemFR for liquid splash protection in harsh environments, Flex for heavy-duty protection against rain and other elements, HydroFR for pressure washing applications, Viz high-visibility rainwear and Base rainwear. **800/262-5755; www.pipglobal.com.**

13. GRIFFCO VALVE PULSATION DAMPENERS

Pulsation dampeners from Griffco Valve are designed to enhance the performance of chemical feed systems. The addition of a Griffco pulsation dampener to a pumping system will reduce harmful shock waves and deliver continuous chemical dosage at the injection point. The dampeners have maximum pressure ratings of 250 psi for metallic models and 150 psi for plastic models operating at up to 70 degrees F. Connection sizes include 1/2, 3/4 and 1 inch (DN 15, DN 20 and DN 25) in NPT, BSPT, socket, union or flange connections. Gauge port sizes

include 1/8, 1/4 and 1/2 inch (DN 6, DN 10 and DN 15). **800/474-3326; www.griffcovalve.com.**

14. FLOMATIC FLO-E-CENTRIC PLUG VALVES

Model 5400 Flo-E-Centric plug valves from Flomatic Valves are designed primarily for the water and wastewater markets in compliance with ANSI/AWWA C517-09. The body, bonnet and plug (NBR encapsulated) are constructed of ASTM A536 grade 65-45-12 ductile iron and flanges are rated ANSI class 150. All fasteners and washers are stainless steel. **800/833-2040; www.flomatic.com. tpo**

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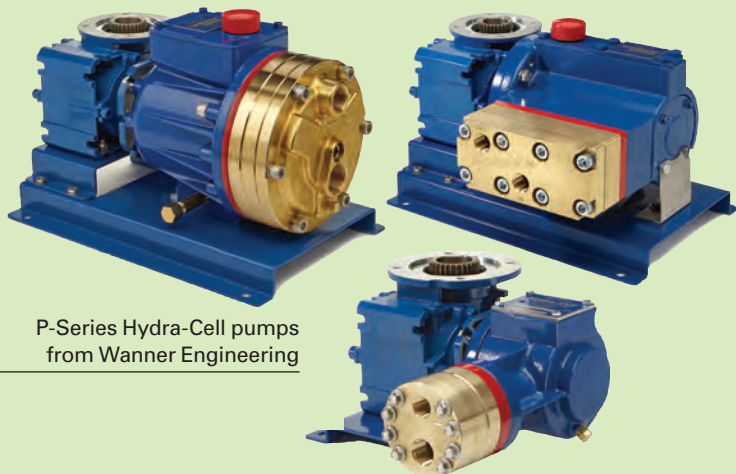
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water: product spotlight



P-Series Hydra-Cell pumps
from Wanner Engineering

Multiple-diaphragm P-Series Hydra-Cell metering pumps minimize pulsations for even flow

By Ed Wodalski

P-Series Hydra-Cell metering solutions pumps from **Wanner Engineering** are available with Aflas diaphragms as well as brass manifolds. Aflas is a copolymer elastomer that resists heat, acids and alkalis. Other diaphragm material choices include EPDM, FKM, PTFE, Neoprene and Bruna-N.

Brass provides a lower-cost alternative to stainless steel and Hastelloy when the higher discharge pressure of a metallic pump head is required. Other manifold choices include cast iron, stainless steel, Hastelloy C, PVDF and polypropylene.

"We created the metering pump from our Hydra-Cell line by adding different ratio gearboxes," says Donelle Capriotti, director of business development, Wanner Engineering. "Many of the features and benefits are the same across the two lines except for the increased accuracy of the metering pumps."

The metering line includes six models with maximum flows of 26.5 to 894.6 gph and maximum pressure ratings from 1,000 to 2,500 psi.

Five of the six models feature a multiple-diaphragm design that minimizes pulsations, producing smooth, linear flow, and eliminating the need for pulsation dampeners. A replenishment valve in every piston assembly ensures actuating oil on every stroke for continuous accuracy.

"Instead of slugs of chemicals being injected into the process, you have a stream, like what comes out of your water faucet," Capriotti says. "You don't get pipe strain like you do with traditional metering pumps. You have reduced acceleration losses on the suction side of the pump. You have a much safer pump because you don't have the pipe stress, which could spill chemicals from the pipe coming apart."

The seal-less design ensures against leaks, wear and replacement. Spring-loaded, horizontal disk valves and seal-less design enable the pumps to handle viscous fluids and abrasive particles up to 800 microns in size (depending on model). Pumps can also run dry without damage.

"Because we use the Hydra-Cell pump and just change the gear reducer, we can use the same pump for different applications that might be pumping from 0.5 gph up to 80 gph," Capriotti says. "Even though it would have a different gearbox on the back, the liquid front end would be the same, enabling you to share parts kits because of the homogenization of the liquid end." **800/369-4172; www.hydra-cell.com.**

industry news

GapVax names Southeast sales rep

GapVax named Terry Brown Southeast sales rep. A native of Greenville, South Carolina, and former Navy veteran, he has a 25-year track record in operations, construction and business development of utility and gas markets with an extensive knowledge of the Southeast.



Terry Brown



Troy Heimerl

JWC Environmental names director of North American municipal sales

JWC Environmental promoted Troy Heimerl to director of North American municipal sales. This newly created position will allow the company to make further investments in serving its customers, while supporting the needs of its world-class partner network. **tpo**

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Honda horizontal GX engines, new in-the-box w/warranty. GX200QX - \$399; GX-270QAG - \$579; GX390QA - \$599 delivered price. 800-363-9855 or GXParts.com (MBM)

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people/awards

Dan Skidmore was hired as manager for the District of Sooke Wastewater Treatment Plant in British Columbia, Canada.

The **Price River Water Improvement District** received the Most Improved Wastewater System award for 2015 from the Utah Rural Water Association.

Donald Mortensen, senior maintenance operator for the Price River Water Improvement District, received the Wastewater Operator of the Year award for 2015 from the Utah Rural Water Association.

Daniel Nix, utilities operations manager for the Wichita Falls (Texas) Public Works Department, received the American Public Works Association's Charles Walter Nichols Award for Environmental Excellence. Under his leadership, the department developed direct potable reuse of wastewater effluent.

The wastewater treatment facility in Cedartown, Georgia, has been renamed the **J.L. "Jay" Wright Wastewater Treatment Facility**, in honor of Jay Wright, who served for 35 years as the wastewater superintendent.

Garver Engineering of Conway, Arkansas, received the People's Choice Award from the American Council of Engineering Companies-Arkansas for its work with Conway wastewater improvements.

Jayne Swift, wastewater treatment plant manager for the City of Crestview, won a Safety Award from the Florida Water Environment Association.

The **City of Weatherford Water/Wastewater Department** received the Municipal Wastewater Treatment Plant of the Year award from the Water Environment Association of Texas.

Rex Blanton, wastewater training director for Alliance of Indiana Rural Water, was named one of the seven members of the Indiana State Soil Conservation Board.

Team Aquatech Solutions won the 2016 British Columbia Water & Waste Association Student Design Competition. The team comprises environmental engineering students Leah MacGillivray, Matthew Waldie, Kelsey Baker, Danielle Gutwillinger, Trudy Miller and Travis Reid from the University of British Columbia and the University of Northern British Columbia. Teams were asked to design a process for the Resort Municipality of Whistler Wastewater Treatment Plant to reduce phosphorus discharge to the Cheakamus River.

Members of ESG Operations partnerships were recognized by the Georgia Association of Water Professionals.

- District 2 Wastewater Top Op: **Tyson Page**
- District 4 Wastewater Top Op: **Dexter Thornton**
- District 5 Distribution Top Op: **Kyle Powell**
- District 5 Wastewater Top Op: **Bennie Williams**
- District 7 Collections Top Op: **Brian Rowland**
- District 7 Distribution Top Op: **Casey Marshall**
- District 7 Wastewater Top Op: **Chris McLarnon**
- District 7 Water Top Op: **Thomas Coker**
- Water Reclamation Facility of the Year (Advanced Treatment 1.1 to 2.9 mgd), **James A. King WWTP**, City of Barnesville
- Water Reclamation Facility of the Year (Secondary Treatment 1.1 to 9.99 mgd), **Cedar Creek WWTP**, City of Winder
- Water Reclamation Facility of the Year (Non-discharging 1 mgd or

events

Aug. 30 - Sept. 1

Kansas Water Environment Association and American Water Works Association-Kansas Section Joint Annual Conference, Capitol Plaza Hotel, Topeka. Visit www.kwea.net.

Aug. 30 - Sept. 2

Chesapeake Section AWWA Annual Conference, Ocean City, Maryland. Visit www.csawwa.org.

Aug. 31 - Sept. 1

The Water Expo 2016, MACC Convention Center, Miami, Florida. Visit www.thewaterexpo.com.

less), **Parkstone at the Bridges**, Forsyth County

- Biosolids/Residuals Program of Excellence Award (Small operating system less than 5 dry tons), **City of Douglas Southeast Water Pollution Control Plant**
- Gold Awards: **City of Augusta Utilities**, **James B. Messerly Wastewater Treatment Plant**; **City of Barnesville James A. King Wastewater Treatment Plant**; **City of Perry Water Pollution Control Plant**; **City of Warner Robins Ocmulgee River Water Pollution Control Plant**; **City of Winder Marburg Creek and Cedar Creek Wastewater Treatment Plants and Marburg Creek Reuse**; **Forsyth County Dick Creek and James Creek Water Reclamation Facilities**; **Rockdale Water Resources Quigg Branch, Snapping Shoals, Honey Creek and Scott Creek Water Pollution Control Plants**
- Platinum Awards: **City of Waycross Wastewater Treatment Plant**; **Forsyth County, Manor Water Reuse Facility, Parkstone at the Bridges and Windermere Water Reuse Facility**; **Rockdale Water Resources Almand Branch Water Pollution Control Plant**

The City of Rockford, Illinois, named **Kyle Saunders** water superintendent, replacing Tim Holdeman and interim superintendent Greg Cassaro.

The **City of St. Petersburg Water Resources Department** was recognized by the Florida Water Environment Association (FWEA) for outstanding achievement at the city's three water reclamation facilities and for its wastewater collections system. The city was honored as the Reuse System of the Year in the large system category for the Southwest, Northwest and Northeast Water Reclamation Plants. The Southwest received the Environmental Stewardship Award for Odor Control. Lane Longley, wastewater maintenance manager, was inducted into the Golden Manhole Society. Craven Askew, chief operator of the Northeast Plant, won the William D. Hatfield Award.

The **Greenville Water Department** was named the Region 1 winner in the Tennessee Association of Utility District's Best Tasting Water Competition.

The **City of Moultrie** water system received a Gold Award for no permit violations from the Georgia Association of Water Professionals.

Tim Doersam replaced Ernie Hinkle as water and gas manager in Jasper, Indiana.

The **Village of Perry** was named Water System of the Year by the New York Rural Water Association.

Kyle Shimabuku, a doctoral student at the University of Colorado at Boulder, received the AWWA 2016 American Water Scholarship of \$5,000.

The **Eagle Mountain Sewer Department** received the Outstanding Wastewater Service to Customers Award from the Rural Water Association of Utah.

(continued)

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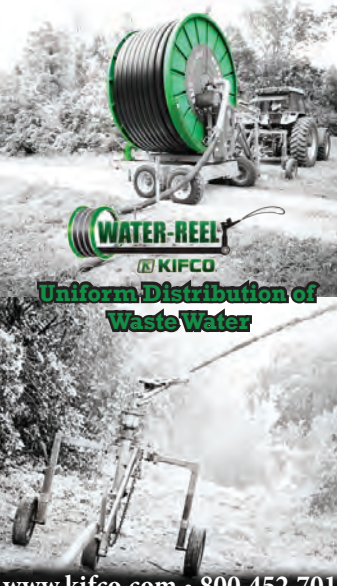
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The **Scarborough (Rhode Island) Wastewater Treatment Plant** received the Gold Award for a flawless record in 2015 from the Narragansett Water Pollution Control Association (NWPCA).

The **Price River Water Improvement District** received the Most Improved Wastewater System award for 2015 from the Utah Rural Water Association.

The **Jordan Wastewater Treatment Plant** received a Certificate of Commendation from the Minnesota Pollution Control Agency (MPCA) for perfect permit compliance in 2015.

City of Campbell River employee **Ed Travanut** was named the British Columbia Water & Wastewater Association 2016 Operator of the Year. He received the Excellence in the Water and Waste Industry Victor M. Terry Operator Award.

Mike Sims of the Mobile Area Water and Sewer System received the William D. Hatfield Award from the Alabama Water Environment Association.

The **City of Stayton** treatment plant was named Wastewater Plant of the Year for 2015 by the West Central Section of Oregon of the Pacific Northwest Clean Water Association.

The **South Dakota Department of Transportation Pierre and Rapid City Regions** wastewater treatment systems received the 2015 Operation and Maintenance Wastewater Treatment Award from the state Department of Environment and Natural Resources.

The **Greenville Utilities Charles Horne Water Treatment Plant**, and the **F.G. Doggett Water Plant** and the **S.L. Spencer Water Plant** in Mount Airy received the North Carolina Department of Environmental Quality Area Wide Optimization Award.

The **City of Salisbury** won Best Tasting Water in Maryland honors in the Maryland Rural Water Association Toasting the Tap competition.

The **Town of Friday Harbor** received the Washington State Department of Health Treatment Optimization Program Award for the third consecutive year.

TPO welcomes your contributions to this listing. To recognize members of your team, please send notices of new hires, promotions, service milestones, certifications or achievements to editor@tpomag.com. tpo

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