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Perspective:
Why operators and
engineers need
to get along

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Tom Pfiester
Wastewater division manager
Big Coppitt Key, Fla.

Bug-Driven *Performance*

**CLOSE ATTENTION TO MICROBIOLOGY KEEPS THE
BIG COPPITT RECLAMATION PLANT ON TRACK**

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Reuse water marketing
in Pompano Beach, Fla.

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Public events in
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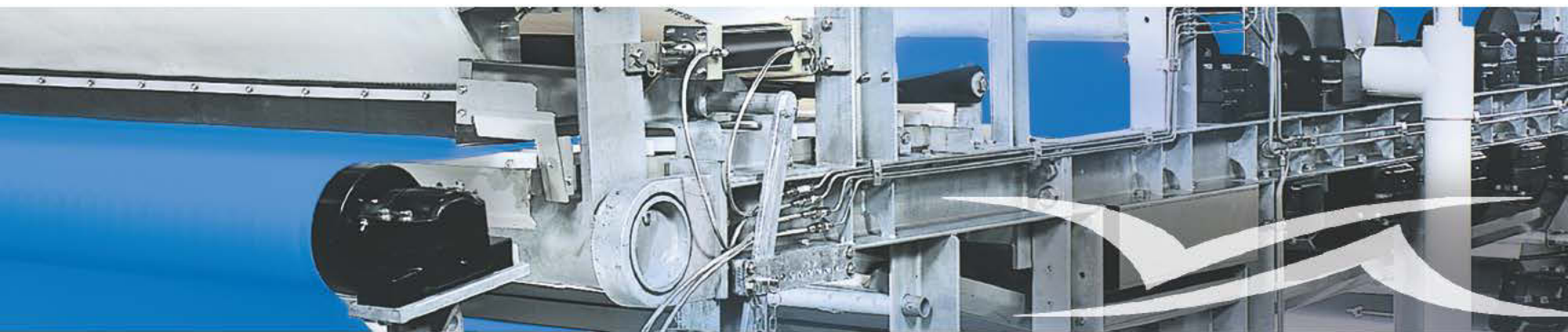
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Tom Pfister, wastewater division manager of the Florida Keys Aqueduct Authority, likes to go by the title of "bug farmer." That's how he describes his work at the Big Coppitt Regional Water Reclamation Facility. "We look at our bugs every day with our microscope," he says. (Photography by Johnny White)



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Published monthly by COLE Publishing, Inc.
1720 Maple Lake Dam Rd., PO Box 220, Three Lakes, WI 54562

Call toll free 800-257-7222
Outside of U.S. or Canada call 715-546-3346
Mon.-Fri., 7:30 a.m.-5 p.m. CST

Website: www.tpomag.com / Email: info@tpomag.com / Fax: 715-546-3786

SUBSCRIPTION INFORMATION: A one year (12 issues) subscription to *TPO*™ in the United States and Canada is FREE to qualified subscribers. A qualified subscriber is any individual or company in the United States or Canada that partakes in the consulting, design, installation, manufacture, management or operation of wastewater treatment facilities. Non-qualified subscriptions are available at a cost of \$60 per year in the United States and Canada/Mexico and \$150 per year to all other foreign countries. To subscribe, return the subscription card attached to each issue; visit www.tpomag.com or call 800-257-7222.

ADDRESS CHANGES: Submit to *TPO*, P.O. Box 220, Three Lakes, WI, 54562; call 800-257-7222 (715-546-3346); fax to 715-546-3786; or email nicolel@colepublishing.com. Include both old and new addresses.

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ADVERTISING RATES: Call 800-994-7990 and ask for Phil or Kim. Publisher reserves the right to reject advertising which in its opinion is misleading, unfair or incompatible with the character of the publication.

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

REPRINTS AND BACK ISSUES: Visit www.tpomag.com for options and pricing. To order reprints, call Jeff Lane at 800-257-7222 (715-546-3346) or email jeffl@colepublishing.com. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicolel@colepublishing.com.

CIRCULATION: 77,431 copies per month.

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let's be clear

What's Wrong With Selling?

PEOPLE IN THE CLEAN-WATER PROFESSIONS SHOULD FEEL FREE TO STAND UP IN PUBLIC AND ADVOCATE FOR THE AGENCIES THEY ARE SWORN TO SERVE

By Ted J. Rulseh, Editor



My first clean-water-related job was with a metro agency looking to win public acceptance for its biosolids land application program, which had run into opposition in some outlying communities where farmers were using the material.

When the agency embarked on a public participation program to get citizens' feedback and suggestions on the program, the local newspaper responded with an editorial cartoon showing a sewer pipe labeled as the agency's "public relations campaign," dumping black goo on a hapless man labeled "tax-payers." The caption read: "The sweet smell of boondoggle."

The accompanying editorial went on about how the agency shouldn't be spending tax money to "polish its image." First of all, that's not what the public participation program did. And second, what's inherently wrong with a public agency going out to the public it serves and telling its story?

I often hear the argument that it's wrong for public entities to engage in "public relations" and "marketing" — that when discussing their projects and initiatives, it should be "just the facts." Don't be an advocate. Just lay out the data and let the public decide. To that I somewhat impolitely say, "Baloney."

NEED TO BELIEVE

Consider a school district putting forth a referendum to build a new school. To hear certain radio talk show hosts tell it, the only "fact" that matters is that the school board is trying to raise people's taxes. What about the benefits of the new building? Like replacing an antiquated school with one that is wired for technology, more energy efficient, cleaner, better lit, more comfortable, and more conducive to learning?

What is wrong with the school board, administration and staff advocating what they believe is best for the institution they are sworn to serve? Doing so is in fact part of their jobs, or ought to be.

Now, should they hide information? Sugar-coat inconvenient facts? Mislead? Of course not. But they should be free to

make the case that the building project is needed, based on the information at hand. The public then has the right to disagree, and say no — that's democracy. But the public officials should feel no obligation to be passive, or neutral, about what they propose. How is it any different for clean-water agencies?

TRUE ADVOCATES

And that brings us to this month's issue of *TPO*. A couple of stories are pertinent. First, there's the DeSoto County (Miss.) Regional Utility Authority, where employees Judy Marshall and Kelly Bowles have created displays that help them go to public events and teach school children and adults about the importance of wastewater treatment. Is that a wasteful exercise in "image polishing"?

How about the utilities department in Pompano Beach, Fla.? They have hired (horror of horrors!) a public relations agency to help market reclaimed wastewater to residential customers for lawn irrigation. They have banners, brochures, a website, and everything. Is that an abuse of ratepayers' money?

And then, looking back two months, to November's issue, there's Ralph Martini, public works director in Heyburn, Idaho. He went door-to-door in his community of 2,900 to explain the need for a major wastewater treatment plant upgrade and the large rate increase that went with it. Should he hang his head in guilt and shame for his deeds?

My answers to these three questions are: No, no, and a thousand times no.

Now is exactly the wrong time to be timid about supporting clean-water plants and infrastructure. Public investment is on the chopping block like never before. If the people in the industry don't speak up for the facilities that keep our rivers and lakes clean, then exactly who will?

TIME TO SPEAK UP

Now is exactly the wrong time to be timid about supporting clean-water plants and infrastructure. Public investment is on the chopping block like never before. If the people in the industry don't speak up for the facilities that keep our rivers and lakes clean, then exactly who will?

As Marshall explained about her agency's outreach program: "Wastewater is not exciting, except maybe to us. But it's critical to our community, and we're our only cheerleaders." So must everyone in the industry be.

With a megaphone and pom-poms? Likely not. But with conviction, energy, and unrestrained enthusiasm? Yes, yes, a thousand times yes. **tpo**

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Out and About

TWO HIGH-PROFILE EVENTS GIVE A MISSISSIPPI WASTEWATER DISTRICT'S EMPLOYEES THEIR FIRST OPPORTUNITIES TO TAKE THE TREATMENT STORY TO THE PUBLIC

By Pete Litterski

Like many people living in one of the nation's fastest growing counties, the DeSoto County Regional Utility Authority is a relative newcomer to the northwest corner of Mississippi — it has served the area for just a little more than a decade.

The county has seen its population explode as businesses and people move to the outer suburbs of Memphis just south of the Tennessee state line. The county was growing so fast at the turn of the century that Mississippi environmental authorities told local officials they needed to build a new wastewater system or see new development halted, recalls Judy Marshall, executive assistant to executive director William Austin and the authority's board.

Marshall and Kelly Bowles, an operations and maintenance technician at the 4 mgd Short Fork Wastewater Treatment Facility, decided in 2010 that the authority and county residents would benefit if the public understood more about the new entity, founded in 2000 to serve more than 60,000 people in a county that is home to 160,000.

Last year, they took their message to two high-profile community events and made a big impression on school children and adults alike.

THE CHEERLEADERS

"Wastewater is not exciting, except maybe to us," says Marshall. "But it's critical to our community, and we're our only cheerleaders." Therefore, she and Bowles looked for ways to share the utility's story. They decided the best way to reach people was through two community events that fit with the wastewater system's mission.

The board approved their request for \$500 for supplies and materials, and they first secured a spot at the annual Outdoor Conservation Field Day/Public Lands Day, sponsored by DeSoto County and Tate County Soil and Water districts, the U.S. Army Corps of Engineers, and the Mississippi State Extension Service.

The event brings more than 1,000 fifth-grade students from two counties to learn about environmental issues. It is held at the Corps of Engineers' Arkabutla Lake in the western part of the county — a fitting site, since the Short Fork plant discharges upstream from the lake.

For their first public presentation, Marshall and Bowles put together a storyboard of the wastewater treatment process from a sink drain to the discharge pipe. They also collected educational materials from a variety of sources, including the U.S. EPA. They estimate they met with more than 750 students as classes came to their station under a portable awning.

Judy Marshall talks to students at the Outdoor Conservation Field Day/Public Lands Day, sponsored by DeSoto County and Tate County Soil and Water districts, the U.S. Army Corps of Engineers, and the Mississippi Extension Service.



Eager students volunteer to answer a question during a Field Day presentation.



PHOTOS COURTESY OF DESOTO COUNTY REGIONAL UTILITY AUTHORITY

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.



Judy Marshall, left, and Kelly Bowles have stepped up to launch an education effort for the DeSoto County Regional Utility Authority.

GRABBING ATTENTION

Marshall says Meleiah Tyus of the conservation district did the utility a great service when she welcomed their request to join the Field Day. "There aren't a lot of people who can give you that opportunity to get out and educate so many children about wastewater," she says.

With so many classes to meet, Marshall and Bowles needed to get the children's attention quickly and then tell them about the treatment process in a short time. "Our first question to them was: 'What is wastewater and where does it go?'" Bowles says. "You know how kids say the darndest things? They really did. That got us off to a good start with each group."

The storyboard served as an outline for their presentation. "It takes them step by step through the process," Marshall says. "It starts with a house. Then we go to a lift station and talk about what that does. Then to the headworks and what that does, then to the aeration basins where we talk to them about activated sludge." Bowles made the presentation and used settleometers to illustrate the state of the wastewater at various stages of treatment.

ON TO EARTH DAY

The experience at the Field Day was so positive that Marshall and Bowles took their presentation to the county's first organized Earth Day activities last April 30 on the county courthouse square in Hernando, one of five communities the authority serves. They used many of the materials from the Field Day and passed out 300 flyers about the utility and its services.

They also spoke with hundreds of people. "We met with a lot of teachers, and we put the word out that we want to get out into the schools and speak to classes about what we do," says Bowles. They found the adults they met on Earth Day just as curious as the students they encountered at the Field Day.

"So many adults, when they saw the aerial shot of our Short Fork plant, said they didn't realize how big our operation was," Bowles says. "We need to try to educate the community about what happens to their water once it goes down the drain."

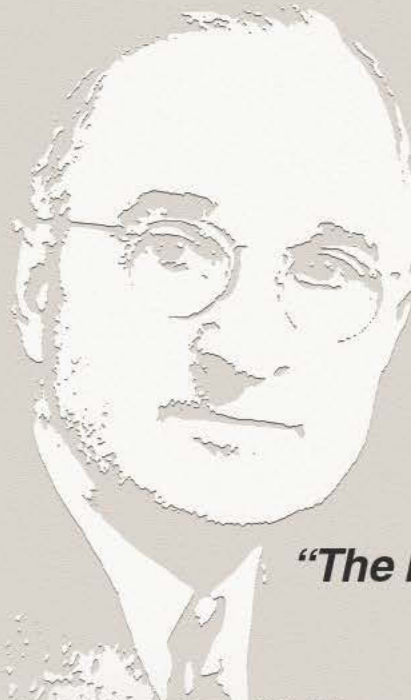
Marshall, a DeSoto County native whose first

"We've got a beautiful area, and taking care of the water is part of preserving it. I love this county, and now I'm right in the middle of protecting it."

JUDY MARSHALL

exposure to wastewater treatment came when she was hired to work at the new utility, has taken on the education work because she has learned how important the system is to the community. "We've got a beautiful area," she says, "and taking care of the water is part of preserving it. I love this county, and now I'm right in the middle of protecting it." **tpo**

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TIRELESS DEVOTION

AWARD-WINNER KATHY COOPER'S DEDICATION TO HER ROLE AND HER STATE ASSOCIATION HAVE BENEFITED COLLEAGUES AND OTHER OPERATORS IN THE REGION

By Trude Witham

WHEN KATHY COOPER MOVED TO ROCHELLE, ILL., SHE HAD TO MAKE a career change: She was a medical technologist, but there were no local jobs open in her field.

She hired on with the Rochelle Municipal Utilities in the wastewater treatment plant laboratory, where her previous lab experience came in handy. Her superintendent, Mike Bollinger, trained her in operations, since she wanted to get out and learn the ropes.

Now, 27 years later, after working at the Rochelle water reclamation plant as a treatment operator and assistant superintendent, she is superintendent of both water and water reclamation. Through those years, she has distinguished herself through tireless devotion to her job and to professional organizations.

This dedication has earned accolades, most recently the 2010 William D. Hatfield award from the Illinois Water Environment Association (IWEA). "I won the Hatfield award because a nice friend nominated me," says Cooper, "But I think serving as president of IWEA, while also being an operator, and being active on various committees within the organization, helped me win."

She also earned the 2003 Operator of the Year award from the Illinois Association of Water Pollution Control Operators (IAWPCO). She has served as an Illinois EPA field instructor and as a member of the Illinois Association of Wastewater Agencies (IAWA) Nutrients Committee, and has given presentations at WEFTEC and other wastewater conferences and workshops.

How does she find time to do all this while supervising six wastewater operators and a full-time and half-time lab technician, and overseeing the



Kathy Cooper, superintendent of water and water reclamation, Rochelle (Ill.) Municipal Utilities. (Photography by Thomas Guschl)

city water plant and 75 miles of sanitary sewer? "I make the time," she says.

CREDIT TO MENTORS

Cooper's track record at the 4.87 mgd (design) city of Rochelle Water Reclamation Plant is impressive. The plant has consistently met NPDES permit requirements, averaging 1.4 mg/l CBOD, less than 1.0 mg/l TSS, 0.1 mg/l ammonia nitrogen, and less than 1.0 mg/l phosphorus. Three members of her wastewater staff have been there for more than 20 years, and there is very little turnover.

Yet, she is humble about her accomplishments, crediting those who trained her, notably Bollinger, former manager of utilities Ray Schwartz, and consulting engineer Matt Hansen at Willett-Hofmann. "There is also the camaraderie and reliance on operators and professionals in other communities, such as fellow IWEA members Sam McNeilly, Greg Garbs, Dave Pauling, Mary Johnson and Dennis Prieuwe."

Cooper had been living in Texas when she decided to return to Rochelle to be near her family. It was Bollinger who saw Cooper's interest and potential and trained her in plant operations and the mechanical workings of the equipment. "At that

time, we had two 180-foot trickling filters that were unable to treat the high-strength waste from a hog slaughtering operation and a yarn-dyeing factory," Cooper recalls. "The filters were overloaded, and the ammonia discharges did not meet the requirements. The plant was placed under consent decree."

To solve the problem, the city in 1991 began building a new activated sludge plant with preliminary treatment, flow equalization, secondary treatment with single-stage aeration and nitrification, secondary clarification, and

"It takes all the employees working together, each with their own strengths, to run a treatment plant. If you have high expectations for yourself and your operators, you will be successful."

KATHY COOPER

The Rochelle team includes, from left, operators Andrew Cunningham, Shawn Mortenson and Gregory Stechschulte, lead operator Thomas Lampley, lab technicians Elaine Ahlberg and Sharon Hawkins, and water and water reclamation superintendent Kathy Cooper. Not Pictured: Operators Jim Moore and Jesse Jones.



profile



Kathy Cooper, Rochelle (Ill.) Municipal Utilities

POSITION: Superintendent, Water and Water Reclamation

EXPERIENCE: 27 years

EDUCATION: Bachelor's degree, medical technology, Northern Illinois University

CERTIFICATION: Illinois Class 1 wastewater treatment, Class C water treatment

MEMBERSHIPS: IWEA, WEF, Illinois Association of Wastewater Agencies (IAWA), Illinois Association of Water Pollution Control Operators (IAWPCO)

GOALS: Treating biosolids for land application, making energy-saving improvements, remaining active with IWEA

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Alfa Laval technician Marty Davidson, left, and Kathy Cooper observe the polymer feed system.

tertiary sand filtration. The new plant was commissioned in 1993.

In 2001, the plant installed the Enviroquip SymBio biological nitrogen removal process (Ovivo) and an automated blower control system. Plant equipment includes:

- Jones & Attwood grit removal (Ovivo)
- Spencer centrifugal blowers (250 hp) (Spencer Turbine Co.)
- Sanitaire fine-bubble diffusers (Xylem)
- ESCOR automated blower controls with Limitorque valves (Flowsolve Corp.)
- Tow-Bro clarifiers (Siemens)
- Aqua-Aerobic traveling bridge sand filters
- Komline-Sanderson gravity belt thickeners
- Alfa Laval centrifuges

Waste activated sludge is sent to the two gravity belt thickeners and is pumped to the centrifuges before being sent to landfill. Plant effluent discharges to the Kyte River.

MOVING UP

When the new plant was complete, Cooper was promoted to assistant superintendent. "I also helped to get a pilot pretreatment program in place, even though it is not required by our EPA permit to have a pretreatment program, and it isn't EPA approved," she says.

The pretreatment portion of the plant is an anaerobic lagoon that treats high-strength wastewater. "The former utility general manager called it the bladder," Cooper says. "It's a giant baggie that holds the wastewater, and the anaerobic bacteria break it down. During the days when it operated as designed, we got about 85 percent BOD removal. There was also a biogas system that we used to flare off the excess gas."

The hog slaughtering operation and a yarn-dyeing factory have since closed, and the pretreatment system is no longer necessary. "The bladder is still in place, although it now acts as a primary clarifier," Cooper says. "We get good solids removal, and a BOD removal of around 25 percent. The anaerobic lagoon supplies the bacteria for the phosphorus removal."

In 1998 when Bollinger retired, Cooper was promoted to plant superintendent. By then, she had extensive hands-on experience in operations, had completed the Sacramento wastewater course, and had earned her Class 1 in wastewater operations. In 2000, the city manager asked her to take on the water division, and after four years of learning that field, she received her Class C license in water operations.

WASTEWATER TEAM

Her wastewater group comprises: Sharon Hawkins, lab technician A, with 12 years at the plant; Elaine Ahlberg, lab technician B, 9 years; Tom Lampley, lead operator, Class 2, 22 years; Greg Stechschulte, operator/maintenance, Class 2, 34 years; Jim Moore, operator/maintenance, Class 2, 22 years; and operator/maintenance employees Shawn Mortenson, 3 years; Andrew Cunningham, 3 years; and Jesse Jones, 7 months.

Cooper trains new operators and meets monthly with her staff to discuss the status of planned projects and hear concerns. The operators maintain the plant, equipment and collection system. "Maintenance skills are a must,"



says Cooper. "Tom Lampley recently installed a SCADA system for the plant. We contract out the major maintenance, such as replacing bearings on the centrifuges."

Although the plant's NPDES permit requires testing only once a week for most parameters, the lab generally tests three to four times a week. Technicians run a settleability test and microscopic examination of the mixed liquor daily. They also perform additional process control testing on COD, phosphorus and alkalinity. The lab staff samples the receiving water upstream and downstream twice a month.



A METTLER TOLEDO balance is used to weigh crucibles for TSS testing.

SOLVING PROBLEMS

Cooper's favorite part of the job is process control matters, such as handling sludge bulking problems, meeting ammonia limits in cold weather, and handling unexpected loading issues. She also loves solving problems. "One of the industrial plants in town dumped some chemicals down the drain, so there was a green liquid going to the receiving stream," Cooper says. "We had to track where it came from by opening the manholes and backtracking the flow to the chemical source."

Cooper's biggest challenge is being a manager. "Dealing with employee issues can be stressful, but I've learned to talk it out with the person, and never do it in anger," she says. Her management philosophy is to empower her employees to make decisions and not be afraid to make mistakes.

"It may not always end up being done their way, and sometimes it's got to be done my way," Cooper says. "But I think my employees would say they enjoy the job, and they all support each other."

A forced merger of the water and wastewater divisions created some tension as wastewater employees had to make room for the water staff, and the water equipment had to be moved to the wastewater site. "This has worked out over time, and the water operators now help the wastewater operators, and vice versa," says Cooper.

(continued)

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Kathy Cooper takes pride in the plant's clean effluent.



GIVING BACK

Kathy Cooper, superintendent of Rochelle Municipal Utilities, has devoted many hours to the Illinois Water Environment Association (IWEA). "I've been involved with IWEA from the beginning of my career, and the contacts with other operators and people in the wastewater field were invaluable," she says. "The organization does a very good job of improving professionalism in wastewater treatment."

Founded 32 years ago, the IWEA received the 2010 outstanding member association award from the Water Environment Federation board of trustees.

Cooper began serving on the plant operations committee in 2000, was operations chair from 2002-2004, served on the executive committee from 2005-2009, was president from 2008-2009, and became the newsletter committee chair in 2010.

Cooper plans to remain active in the organization. "I'm not sure what my next role will be after this one, but the newsletter will have a new format with our next issue, and that is a big change."

OVERSIZED PLANT

A key challenge is operating and maintaining a reclamation plant that is too large for the present load. "The plant is so over-designed for what we have to treat right now," Cooper says. "We have four aeration tanks but are only using one. We have two 100-foot clarifiers, and are only using one. We have four 250 hp blowers and are using one at its lowest amperage."

The plant was designed to treat 13,000 pounds of BOD. In 1999-2000, monthly average BOD was nearing capacity at 11,000-12,000 pounds per day. In 2000, the plant upgraded the capacity to 18,000 pounds per day. But when the hog slaughtering and yarn-dyeing plants closed, the BOD load dropped to 3,500 pounds per day. Then, another industrial user ended production, and the load dropped to 2,000 pounds per day. Today, the Rochelle plant treats about 5,000 pounds of BOD per day, at a flow of 2.0 mgd.

The plant must maintain the unused equipment so it is ready in the future. "We rotate blower operation, so that all blowers are used regularly," Cooper says. "It's an operation and maintenance challenge to have more equipment than we need."

That is starting to change. A maker of meals-ready-to-eat (MRE) for the military is operating at the former hog slaughtering site, and the treatment plant has started accepting landfill leachate. "We are seeing a lot of warehouses going in, and although they are not large sewer users, we still need to get service to their facilities," says Cooper. "Right now, we're putting in new lift stations to serve those areas."

Rochelle Municipal Utilities Water Reclamation Plant PERMIT AND PERFORMANCE

	PERMIT (monthly average)	EFFLUENT (2010 average)
TSS	12 mg/l	<1.0 mg/l
CBOD	10 mg/l	1.4 mg/l
pH	6-9 mg/l	7.85 mg/l
Dissolved oxygen	6.0 mg/l (Aug.-Feb.)	7.5 mg/l
Fecal coliform	400/100 ml daily maximum	<100
Ammonia nitrogen	1.2 mg/l	0.1 mg/l
Phosphorus	Monitor only	<1.0 mg

FUTURE GOALS

Looking farther ahead, Cooper's goals include making plant improvements with a limited budget and making sure there will be enough money for future upgrades. "There is no state program for energy efficiency upgrades to treatment plants in communities served by a municipal electric provider," she says. "The treatment plant was constructed under the IEPA State Revolving Fund Program. The loan has been refinanced with lower interest rates."

Cooper is working on a 20-year plan with an engineering consultant to prioritize what needs to be done to meet future growth and regulations, and to operate the 20-year-old plant more efficiently.

Priorities include rehabilitating the sand filters, starting a replacement program for the centrifuges, cleaning the lagoon, and rewelding the cover seams. Cooper would like to see better grit removal at the headworks.

"Every year when we clean the diffusers, we have to remove grit from the aeration tanks," she says. "The grit also decreases the life of the pumps." She would like to incorporate anaerobic digestion at the plant so that biosolids could be used on farmland. Another wish is energy-saving improvements: installing more variable-frequency drives, and replacing older centrifuges and blowers with more energy-efficient models.

Lowering customer rates is another goal. "Our rates are some of the highest in the state," Cooper says. "About a third of our rate structure is debt payment, and this will be significantly reduced when our revolving loan is paid off in 2014."

In the meantime, Cooper plans to continue her hard work for Rochelle Municipal Utilities. "I am not able to do this alone," she says. "It takes all the employees working together, each with their own strengths, to run a treatment plant. If you have high expectations for yourself and your operators, you will be successful." **epo**

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Teddy Knowles, lead operator at Big Coppitt, takes a grab sample of effluent after disinfection. (Photography by Johnny White)



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CLOSE ATTENTION TO MICROBIOLOGY HELPS THE BIG COPPITT RECLAMATION PLANT CONTINUOUSLY MEET STRINGENT WATER REUSE STANDARDS IN THE FLORIDA KEYS

By Jim Force



profile



Big Coppitt (Fla.) Regional Water Reclamation Facility

POPULATION SERVED:	2,500 (plus vacationers)
BUILT:	2007-2009
TREATMENT LEVEL:	Advanced tertiary
FLOWS:	0.323 mgd design, 0.100 mgd average
TREATMENT PROCESS:	SBR nutrient removal, deep-bed sand filtration
BIOSOLIDS:	Centrifuge dewatering, cake to landfill
ANNUAL BUDGET:	\$400,000 (plant and collection system)
WEBSITE:	www.fkaa.com
GPS COORDINATES:	Latitude: 24°35'30.75"N; Longitude: 81°40'46.41"W

Big Coppitt's exceptional performance led the Florida Water and Pollution Control Operators Association to name the Aqueduct Authority its utility of the year in 2010. The plant also earned an award from SBR supplier Aqua-Aerobic for outstanding performance.

THE BAD OLD DAYS

It's no surprise that water and wastewater have presented challenges throughout the Keys, a string of small islands extending for 130 miles into the Gulf of Mexico southwest of the Florida mainland. Historians have documented secret "water holes" used by Keys Indians hundreds of years ago, but with groundwater almost nonexistent, residents have relied on rainwater, small desalination plants, tank car shipments, and water pipelines from the mainland.

For years before establishment of the Aqueduct Authority, wastewater was discharged directly to the ocean or to septic system leachfields. In 1998, the state legislature gave the Authority responsibility for wastewater collection and treatment, and plans for new sewer systems and treatment plants got underway in earnest. Today, the Big Coppitt facility is one of five treatment plants run by the Authority, and a sixth plant is under design.

COLLECTION AND TREATMENT

Wastewater heads to Big Coppitt through a collection system with 71,800 linear feet of gravity sewers, 34,500 linear feet of force mains, and 21 lift stations. The service area includes about 2,500 residents, and many more visitors during vacation season. At the treatment plant, a Hycor Helisieve Plus (Parkson) auger-type bar screen removes debris and large solids. The flow then moves on to the three-tank SBR biological system.

The tanks fill and decant every six hours, treating the wastewater in batches. In the first fill cycle, or mixing phase, influent enters the tank while only mixing takes place. In the oxic fill phase, influent continues to fill the tanks as both mixing and aeration occur. Fine-bubble diffusers on the tank bottom provide the air. Then the air is turned off, but the contents continue to be mixed as the fill cycle is completed in the anoxic phase.

Pfiester notes that the oxic fill and anoxic fill phases can be repeated depending on how the operator has set up the PLC-controlled timer and duration configuration. Once the fill cycle is completed, the system goes into the react mode, where the wastewater is mixed and aerated for an extended period. Then the solids are separated in the settling cycle before the decant cycle, where the clear water is drawn off and pumped to an equalization basin.

Pfiester explains that normal flows require the capacity of two of the

WASTEWATER PROFESSIONALS GO BY MANY TITLES:

plant manager, chief operator, environmental coordinator. But "bug farmer"?

That's how Tom Pfiester, wastewater division manager of the Florida Keys Aqueduct Authority, describes his work at the Big Coppitt Regional Water Reclamation Facility. And with good reason.

"We look at our bugs every day with our microscope," he says, calling that instrument one of the most under-used tools in the industry. "It helps us stay proactive and really see what is going on in our mixed liquor. This is really a bug farm, and our job is to grow a good crop."

So far, Pfiester and his team have enjoyed excellent yields. Online for just two years, the 0.323 mgd (design) Big Coppitt facility uses a three-tank sequencing batch reactor (SBR) biological system, sand filtration, and disinfection to achieve a pristine product water. Recycled for irrigation and other nonpotable uses, the effluent helps the residents of Rockland and Big Coppitt Keys — just a few miles from Key West — deal with a scarcity of freshwater sources.

One of the plant's three sequencing batch reactors in an aeration cycle. The plant earned an award from SBR supplier Aqua-Aerobic for outstanding performance.



Big Coppitt Regional Water Reclamation Facility
PERMIT AND PERFORMANCE

	INFLUENT (Average-Peak)	EFFLUENT	PERMIT
CBOD	200-250 mg/l	2.1 mg/l	5 mg/l
TSS	265-320 mg/l	1.5 mg/l	5 mg/l
Total N	56-62 mg/l	1.85 mg/l	3 mg/l
Total P	9-11 mg/l	0.21 mg/l	1 mg/l

three tanks. During high flows, the third tank can be put into action. A submersible waste activated sludge pump moves a portion of the settled solids to the biosolids holding tank or digester.

The solids are thickened to 1.5 to 2.0 percent solids, using a cationic polymer. Andritz centrifuges dewater the material to 24 to 28 percent solids, and a private contractor hauls a load of dewatered cake to a mainland landfill about once every two weeks. "The centrifuge really makes this plant efficient, says Pfiester. "Before, we were hauling wet sludge all the way to the mainland for processing. It was very expensive."

Final polishing of the effluent takes place in three Severn Trent deep-bed sand filters. Sodium hypochlorite disinfects the product water before it is delivered to the water reuse system storage tank. The authority maintains more than two miles of reuse system piping, and residents have the option of connecting to it for nonpotable water for irrigation, boat and car washing, and other applications.

Roy Coley, director of operations for the authority, explains that the hookup is free to end-users. The recycled water consumption rate is 70 percent of the rate for potable water. About 25 percent of the residents in the Big Coppitt service area use recycled water. "They seem to like it," says Coley. "During the dry season, we have watering restrictions," and the recycled water is a logical alternative.

At the plant, excess effluent water can be pumped into a shallow injection well if the reuse tank is full, or if the water does not meet the specifications based on fecal coliform count. Coley says, however, that the plant produces reuse water "pretty much all the time." The plant maintains a Wonderware (Invensys Operations Management) control system that uses Active Factory software to tie all plant PLCs together and trend a wide range of data.

A FRESHWATER LIFELINE

A 130-mile-long freshwater pipeline, conceived of as far back as 1925, built by the U.S. Navy in 1939, and enlarged and upgraded in 1980, continues to supply freshwater to the residents of the Florida Keys. Through the years, it has survived hurricanes, damage from passing ships, and low flows due to inadequate pumping. It is truly a lifeline to the mainland.

"It might be a world record for length," observes Roy Coley, operations director of the Florida Keys Aqueduct Authority. The earliest plans for a water pipeline were scrapped after rail service was established in the 1920s, enabling tank cars to carry water all the way to Key West.

Ships and barges were used as well. But after a hurricane damaged the rail line in 1936, the Navy decided a pipeline was needed to assure a reliable supply of clean water to its base at Key West. Withdrawn from the Biscayne Aquifer on the mainland, water was pumped the length of the Keys through an 18-inch line that had to be tied to bridges at 43 channels and placed on the ocean bottom at 13 channel crossings.

It took six days for the water to reach Key West, and sometimes pumping problems caused the flow to essentially disappear before it got to the end of the line. Whatever water the Navy didn't use was sold to communities.

In 1976, the Navy sold the land, buildings, wells and pipeline to the Aqueduct Authority, which made plans, raised funds, and built a new 36-inch pipeline from the mainland to Marathon, stepping it down to 24 inches from Marathon to Upper Sugarloaf Key, and to 18 inches from there to Key West. Capacity is 30 mgd; average flow is about 19 mgd.

Since other communities and water authorities also use the Biscayne Aquifer mainland wells for water, the authority has constructed a recovery and storage system using a different aquifer to supplement the original source.

Coley says the authority has two full-time teams devoted to pipeline maintenance, repairs, flushing and coating. The main concerns are where the line passes over water on bridges, or beneath the surface at the channel crossings. Besides the risk of damage by ships or dragging anchor lines, the crew members fight corrosion, monitor valves, and stay on guard for hurricanes, which have a history of raising havoc with this vital connection to the mainland.

SBR EXPERTS

"We grew up on SBRs," says Pfiester. "We've had experience with many different types, but we really like the Aqua-Aerobic system. It's very flexible; we can operate it in series or parallel." Even so, the Big Coppitt crew has made modifications to the three-tank system to improve operations.

"Aqua-Aerobic provides a very nice PLC program with their installation," says Pfiester. "They are light-years ahead in controls. But we had them customize the programming in a few areas." One adjustment was single-tank operation with one of the other two tanks serving as an equalization basin. "This allows for a true batch process instead of decanting while filling (in the same tank) during single-tank operation."

Another change involved five additional timers (for a total of 10) to the fill and react cycles to allow for more operator flexibility. The Big Coppitt



The Big Coppitt team includes, from left, standing, Roy Coley, director of operations; Danny Price, operator; Elishea Strickland, administrative assistant; Jay Miller, mechanic foreman; Kanahou Alana, operator; Argelio Companioni, mechanic; Dan Hill, mechanic; Dave Hoffman, mechanic; and Tom Pfister, wastewater division manager. Kneeling, from left, Theodore (Teddy) Knowles, lead operator; and operators Terry Ronget, James Money, and Jim Knafla.

"The ORP probes are a critical component for us, ensuring that we are creating the right anaerobic and anoxic conditions needed to denitrify within the SBR basins."

ROY COLEY

staff also worked with the engineering staff to design additional valves and piping, allowing the tanks to be gravity-drained, instead of pumped dry, when maintenance is needed on the fine-bubble diffuser headers.

"We also can reroute supernatant from the SBRs back to the headworks to be retreated if necessary," explains Coley. The size of the mudwell (or reject tank) was also increased to equalize the high-nutrient substrate from the centrifuge over the batch process. Otherwise, it could overload any single batch.

The Hach instrumentation package is another essential part of the success at Big Coppitt. The plant uses Hach sc1000 universal controllers networked with Hach probes that monitor TSS, nitrates, ORP (oxidation reduction potential), and dissolved oxygen. The sc1000s can accept extra probes for troubleshooting to each SBR basin.

"The ORP probes are a critical component for us, ensuring that we are creating the right anaerobic and anoxic conditions needed to denitrify within the SBR basins," explains Coley. "They also help us by determining when we can use the existing carbon coming in with the raw influent to meet nutrient

TEDDY THE SUPERMAN

Florida Keys Aqueduct Authority operations director Roy Coley and wastewater division manager Tom Pfister refer to Teddy Knowles, Big Coppitt plant lead operator, as "Superman."

"He's a go-go type of guy," says Coley. "He doesn't know any other way." Knowles started out as an operator trainee, has obtained his level C state certification and is preparing for level B. "He came in with no experience or education in wastewater treatment," says Pfister. "He gained experience, got his license and has become proficient in a very state-of-the art plant."

Coley adds, "There isn't anything he can't do. He handles budgets, optimizes our chemical usage, even runs the centrifuges."



Teddy Knowles

removal requirements, as opposed to adding expensive chemicals. We challenge ourselves every day to use the incoming wastewater for our carbon source."

The DO probes control the variable-frequency drives on the blowers (Kaeser Compressors), assuring accurate control of the aeration systems — critical in the nitrification-denitrification processes. A ChemScan (ASA Analytics) nutrient analyzer records and plots effluent nutrient levels.

Lead operator Teddy Knowles views a microscopic sample on an LCD screen mounted on the wall. The screen is used for training and tours, and as a resource when it helps to have more than one set of eyes to evaluate microbiology and decide on process decisions.



"We look at our bugs every day with our microscope. It helps us stay proactive and really see what is going on in our mixed liquor. This is really a bug farm, and our job is to grow a good crop."

TOM PFIESTER

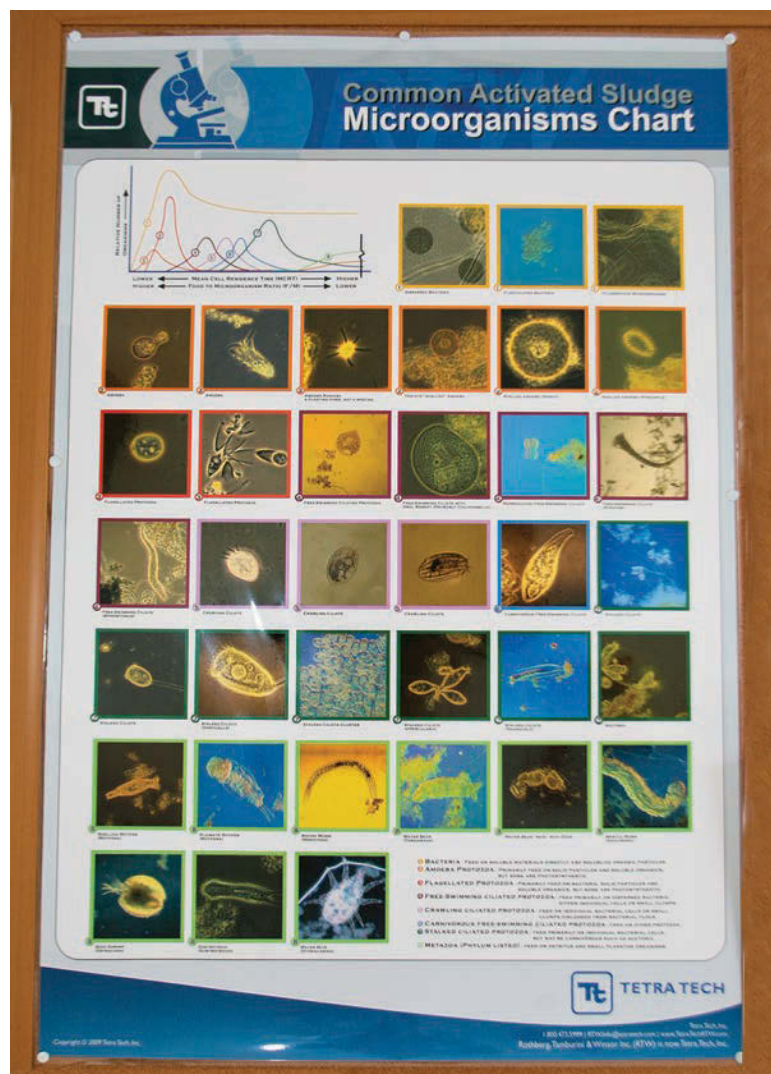
EFFECTIVE TROUBLESHOOTING

Nutrient removal, of course, is essential to meeting state standards for advanced treatment and producing product water that can be recycled to the community. The Big Coppitt team has developed a checklist of troubleshooting steps to make sure the system meets nitrification-denitrification standards. The key is extensive monitoring of alkalinity, pH, ammonia nitrogen and nitrates.

"We start by sampling for these in the idle phase, to see what's left from the last cycle, and we use that as a starting point for the next batch," says Coley. At the end of the mixed fill cycle, the plant staff samples again while monitoring for DO and ORP. These values in turn give a good indication of the amount of nutrient removal being achieved and whether cycle times need to be changed.

The same parameters are sampled in the oxic cycles to determine the proper amount of aeration, and in the anoxic and react cycles to confirm denitrification and BOD removal. The sampling and monitoring also help the plant optimize biological phosphorus removal throughout the steps, without degrading nitrification-denitrification. The addition of aluminum sulfate between the sand filters polishes off any remaining phosphorus.

In the end, however, it is the bugs that really tell the treatment story at Big Coppitt. Pfister's staff performs a visual inspection of the plant biology every day. "We look at all our indicators — where we are on food-mass ratio, floc structure, floc color, filamentous growth," Pfister says. "We identify the organisms we want to maintain, or increase, or decrease. We don't try



A microorganisms chart from Tetra Tech is a quick-reference tool that helps plant personnel identify the F/M ratio and regularly make wasting decisions.

to eradicate filaments, rather control them. Filaments are very good BOD removers and also help produce a very clear effluent.

"We run the plant with the microscope, rather than just turn the air on and run the equipment. It's a mixture of art and science." **tpo**

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AWARDS EARNED BY LINDA BARRIER AND HER TEAM AT ROCK CREEK WASTEWATER TREATMENT PLANT CAME FROM ATTENTION TO DETAIL — RIGHT DOWN TO THE BUGS

By L.K. Williams

Clarifier tanks at the Independence treatment plant. The Rock Creek plant treats 10 mgd and uses a basic activated sludge process. The biosolids treatment process includes dissolved air flotation and wet-air oxidation. Biosolids are burned in a fluidized bed incinerator. (Photography by Denny Medley)



HOW DO OPERATORS WORK AFTER WINNING consecutive safety and plant awards from their peers? Harder than they did before, according to Linda Barrier, superintendent of the Rock Creek Wastewater Treatment Plant in Independence, Mo.

In 2010 the Missouri Water Environment Association (MWEA) recognized the facility with the Treatment Plant Safety Award. It had earned the Treatment Plant of the Year award in 2009 — one achievement the Rock Creek team wanted most. “We all set our minds to it and went after it,” Barrier says.

On the ground, that meant seeing the big water-quality picture and attending to all the details that make compliance a reality. “You go out, you look, you smell, you take everything into consideration,” Barrier says. “One of my big deals down here is that I like to look at the bugs that we’re growing every day. They can tell you the whole story. We made a habit out of every test that we run; we take a look at the bugs.”

This practice and others have served Barrier and the plant well. A 29-year industry veteran, she won the MWEA’s William D. Hatfield award in 2008, and its Operator of the Year award in 2006.

GOING MUNICIPAL

Barrier turned to the municipal sector after being laid off from a man-

agement position at a steel company, where she was in charge of neutralizing the acids used to clean steel rods. After that experience, she was looking for more than a job. “I had seen that there was a need in the wastewater treatment field,” she says. “It was something back in 1982 that nobody wanted to do, and it was going to be a pretty secure field, and it was going to be growing.”

After about a year of applying for positions in the male-dominated field, she was hired by the city of Independence. “When I had my interview down here, one of the guys who interviewed me told me that no women could do this job,” she recalls. “And I told him, ‘You’re looking at the first one.’”

Barrier took entry-level and advanced wastewater certification courses from Joe Herndon Area Vocational Technical School in Raytown, Mo. (Now known as the Herndon Career Center.) At that time, Dick Champion was an instructor there and was (and still is) director of the Independence Water Pollution Control Department. Barrier credits his guidance for helping to build her skills.

“He challenged me and still does to this day,” she says. “You had to be sharp in class because you knew he was going to try and trip you up with questions.” Champion this year received a National Environmental Achievement Award for his service and commitment from the National Association of Clean Water Agencies.

Plant superintendent
Linda Barrier.



profile

Rock Creek Wastewater Treatment Plant, Independence, Mo.



BUILT:	1978 (expansion in progress)
POPULATION SERVED:	55,000
DESIGN FLOW:	10 mgd
TREATMENT LEVEL:	Secondary
TREATMENT PROCESS:	Activated sludge
RECEIVING WATER:	Rock Creek (Missouri River tributary)
BIOSOLIDS:	Incinerated
WEBSITE:	www.ci.independence.mo.us/wpc/Wastewater.aspx
GPS COORDINATES:	Latitude: 39°6'55.50"N; longitude: 94°27'51.88"W

NOT LAUGHING NOW

Confidence in her abilities and dedication to the goal also brought Barrier forward in her career. "When I first started here, I told people, 'I'm going to be your boss someday,'" she says. "They laughed at me." No one seems to be laughing now. She scaled the ladder from operator I to shift supervisor to assistant superintendent and then, about 10 years ago, superintendent.

Searches for better opportunity brought key members of Barrier's team together at about the same time she earned her last promotion. Jon Staton, operator I, left a bankrupt agricultural co-op to join the team. Dan Francis, operator II, was laid off from Armco Steel. Khristina Irvine, administrative specialist, came from a failed accounting software company. Vince Kackley, operator II, was hired after serving in the U.S. Navy, where he worked as a pipefitter, welder and ship wastewater treatment operator. The team's success, Barrier says, comes from working together and never settling for "second best."

Operator Justin Smith
takes sludge samples.



Rock Creek Wastewater Treatment Plant PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT
BOD	187 mg/l	11.6 mg/l	30 mg/l
TSS	561 mg/l	8.9 mg/l	30 mg/l
Ammonia	33 mg/l	14.8 mg/l	N/A
pH	7.3	7.3	6-9
DO	N/A	7.5 mg/l	N/A

"Linda gives us guidelines, but she pretty much lets us run the process. We make sure we're in compliance, way in compliance."

DAN FRANCIS

With a hint of pride, Barrier says that although Irvine works in the plant office, she has passed the Level D wastewater certificate exam. "That shows how interested and dedicated people are down here," she observes.

COMPLIANCE AND UPGRADE

How does the Rock Creek team work day-to-day? "Linda gives us guidelines, but she pretty much lets us run the process," Francis says. "We make sure we're in compliance, way in compliance." Rock Creek's NPDES permit allows an average of 30 mg/l for TSS and BOD, but the treatment process routinely produces less than half that.

Constructed in 1978, the plant serves about 55,000 residential customers in Independence and Sugar Creek. The 10 mgd activated sludge plant is undergoing an expansion, first with an upgrade to fine-bubble aeration.

In the current process, wastewater flows into four 60-foot-diameter primary clarifiers. In secondary treatment, mechanical aerators in four 64-foot-square basins provide oxygen for bacteria to grow and feed on the effluent over four to six hours. After the secondary clarifiers, the effluent flows to Rock Creek, a Missouri River tributary.

With the help of a \$1 million American Reinvestment and Recovery Act grant, the city plans to replace its mechanical aerators with a fixed-header, fine-bubble diffused aeration system to improve turndown capability. The process is moving forward after construction permit approval in March and a preconstruction meeting in August.

"We've been wanting that for 10 to 15 years," Barrier says. "Diffused aeration will provide better control of the heartbeat of the activated control sys-



Operator Dan Francis takes samples at the belt press (Ashbrook Simon-Hartley).

tem.” The upgrade also will reduce operating horsepower by 40 percent, saving about \$40,000 in pump operating costs, according to the HDR consulting engineering firm, which designed the plant expansion and upgrade.

SOLIDS AND STORMWATER

Rock Creek’s solids treatment process includes the blending of thickened primary sludge with excess waste activated sludge that has undergone water reduction through dissolved air flotation (DAF). Blended sludge moves through grinders and Siemens Water Technologies – Zimpro conditioning.

A high-pressure Ingersoll Rand air compressor injects air into the sludge flow at the entrance of the first heat exchanger inflow pipe. A generator operating at 400 psig sends hot steam into the reactor. The 850-gallon reactor operates at 385 degrees F for 30 minutes between 320 and 350 psig. Kackley explains that the wet air oxidation process “pressure cooks” the material, breaking down organic materials for easier dewatering by the Ashbrook gravity belt press. Barrier notes that the changeover to belt presses from vacuum filters significantly improved the solids percentage.

After time in the decant basin, the biosolids cake is ready for incineration. Staton uses a little oil to fire up the Dorr Oliver fluidized bed incinera-

EDIBLE ICE CREAM AQUIFERS

If you haven’t seen an edible ice cream aquifer, you might want to visit next year’s Ecofest – It’s All About Water! Held in June at Waterfall Park in Independence, the event has developed a following over the last four years. The ice cream was part of one interactive display at the cooperative watershed and stormwater management awareness festival.

The event this year received the National Association of Clean Water Agencies Environmental Achievement Award for public information and education. Supported by the Independence Department of Water Pollution Control, the Missouri Department of Natural Resources (MDNR) and a few companies, the festival attracts about 500 people.

MDNR created the edible ice cream aquifer station to get the attention of children and teach them about groundwater. The “aquifer” uses clear soda (water), ice cream (confining layer), food coloring (pollution), sprinkles (sand and gravel) and a straw (for drilling a well).

Other hands-on activities include a stream table demonstrating bank erosion and water themed games. The festival engages local elementary students through a T-shirt design contest.

Kristina Irvine, administrative specialist, explained that Ecofest is only one of several green initiatives the department and Rock Creek plant take on. For 12 years, the department has coordinated the household hazardous waste program. The department also encourages volunteers to report rainfall across the watersheds in its jurisdiction.

More recently, the Rock Creek plant is setting up rain barrels on site and at the sewer maintenance division to supplement irrigation water for landscaping and possibly for an employee-planted vegetable garden.



The Rock Creek team includes, front row, from left, Stephanie Mitchell, Ken Kalwei, Kristina Irvine, Christine Smith and Casey Park; back row Frank Bailey, Randy Dickson, Don McPheeters, Dan Francis, Wayne Brock, Justin Smith, Jon Irvine, Jon Staton, Vince Kackley, Linda Barrier, John Rucker and Dennis Lewis.

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The Independence plant has earned numerous awards, including the 2009 Treatment Plant of the Year Award from the Missouri Water Environment Association. It received the same award in 1983, 1986 and 1989. In addition, the plant won the MWEA Treatment Plant Safety Award for 2010.

tor to 1,100 degrees but quickly shuts off the fuel because the cake burns by itself. Water "knocks" the ash off the exhaust, and the resulting slurry is pressed to a dry form and sent to landfill.

TACKLING WET-WEATHER FLOWS

One of the biggest challenges for Barrier and her team is controlling flow during heavy rains. The expansion plan should help the facility achieve zero bypasses. Over the next five years, overflow basins are to be added at five pump stations to handle excess flows. The department considers the basins a preventive measure that will help the plant meet future, stricter regulations.

Working with HDR on the plant expansion, Barrier has developed a wish list that includes more SCADA control at the pump stations with overflow basins. The facility operates now with a Wonderware (Invensys Operations Management) Factory Suite In Touch SCADA system. She also has asked for new dissolved oxygen meters for the aeration system to help monitor and control the activated sludge system.

Pending nitrification and disinfection regulations are driving future upgrades. By 2013, the facility will have new chlorination-dechlorination facilities to comply with state rules. By 2015, Rock Creek will have enlarged its blower building to accommodate four more aeration basins for nitrification requirements in its permit. All told, the expansion will enable the facility to increase peak capacity from 18 mgd to 20 mgd.

LOTS OF MOTIVATION

Working in wastewater treatment can become a routine, but the Rock Creek team generates positive energy. "It's the people I work with that keep me interested," Barrier says. "When you get along with people and accomplish things, it keeps you going."

Kackley says his shifts are not really "work" because he enjoys what he's doing. Staton suggests that part of the team's motivation comes from making a difference today for tomorrow's environment.

With the advantage of having a self-motivating team, Barrier employs the simplest management style. "Actually, I like to sit back and do nothing, just empower them," she says. "I let them do their jobs." **tpo**

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FROM A SUPERSATURATED DISSOLVED OXYGEN SYSTEM AND SOLAR BIOSOLIDS DRYING TO WILDLIFE HABITAT AND A XERISCAPE GARDEN, AN ARKANSAS PLANT KEEPS IT GREEN

By Doug Day

When a pilot test showed that a new post-aeration system was increasing dissolved oxygen by 70 percent while using 75 percent less power and liquid oxygen, the team at the Paul R. Noland Wastewater Treatment Plant knew they had found something they wanted. Run by CH2M HILL, the plant in Fayetteville, Ark., became the first to use a new technology for polishing effluent — a Supersaturated Dissolved Oxygen Injector.

Called SDOX by its inventor, BlueInGreen of Fayetteville, the technology was developed with funding from the National Science Foundation and private equity investors. “I met them in 2006,” says Duyen Tran, project manager at the plant. “The founders are professors at the University of Arkansas. It sounded interesting, so we set up a live trial run. We tested it for a month and it looked very beneficial for our process.”

The test indicated potential savings of \$15,000 per year, so the plant installed it in late 2007. “We now realize savings of more than twice that amount per year, so it’s been very good for us,” Tran adds. “At the time, we thought we’d get payback in about five years. We actually had the system paid for in less than three years.”

The pilot helped the SDOX win the 2010 Innovative Technology Award from the Water Environment Federation.

“At the time, we thought we’d get payback in about five years. We actually had the system paid for in less than three years.”

DUYEN TRAN

That’s just one of the many things the plant has done to save money and reduce environmental impact. For instance, improved SCADA monitoring of lift stations and more efficient driving routes reduced truck travel by 6,100 miles, saving 436 gallons of fuel and 9,069 pounds of CO₂ emissions annually.

The plant has also maintained a Running Register of Sustainability that encourages suggestions from the staff. Resulting projects include:

- Increased lighting efficiency
- Solar drying of biosolids
- Automated control of aeration
- Pedal-powered and electric vehicles for in-plant transportation

FIRST OF ITS KIND

The SDOX technology has reduced the use of liquid oxygen at the plant by 2.8 million cubic feet a year, according to operations manager Tim Luther. “It uses new oxygenation technology that



Duyen Tran, CH2M HILL project manager at the Paul R. Noland Wastewater Treatment Plant, takes a spin on one of the plant’s zero-emission vehicles. The other is an electric utility cart.

restricts oxygen loss to the atmosphere so that nearly 100 percent of the oxygen fed to the system is dissolved,” he says. “It uses less oxygen and power, saves money, and is much more environmentally friendly. That is sustainability.”

The oxygen is supersaturated into solution under pressure, and the solution is fed into the treated effluent for polishing, enabling more efficient oxygen transfer. With no degassing taking place, all of the dissolved oxygen is available for the natural removal of residual volatile organic compounds (VOCs) and other pollutants.

Delivering up to 350 mg/l of oxygen, according to BlueInGreen, the system can be used for odor control in facilities such as force mains, for supplemental oxygenation in other plant processes, for lake and reservoir oxygenation, and at spill sites in rivers and streams to provide oxygen to prevent fish kills.

Fayetteville’s 12.6 mgd A2/O biological nutrient removal (BNR) treatment plant is also testing another BlueInGreen invention called HyDOZ. That unit, already proven in small-scale tests, is in its first large-scale pilot test. “Using the same principle as supersaturated oxygen, it uses supersaturated ozone to help disinfect wastewater,” says Tran. “The added benefit could be the removal of emerging pollutants like pharmaceuticals and volatile compounds.”

SUGGESTION BOX

The staff is encouraged to suggest projects that are evaluated and tracked by a spreadsheet tool called the

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AWARD WINNER

The Paul R. Noland Wastewater Treatment Plant has received numerous awards related to sustainability in recent years:

- 2011: Wildlife Habitat Certification, National Wildlife Federation, wetland project
- 2010: Wildlife Habitat Certification, National Wildlife Federation, habitat improvements
- 2009: Governor's Corporate Conservationist of the Year, Arkansas Wildlife Federation
- 2009: Illinois River Watershed Partnership Golden Paddle Award, prairie restoration
- 2008: U.S. Conference of Mayors, Public/Private Partnerships Outstanding Achievement Award
- 2008: Arkansas Department of Environmental Quality, Environmental Stewardship Award Finalist, Sustainability category

The plant and its staff have also received nearly 20 awards for operational and safety excellence from various organizations since 2008.

Running Register of Sustainability. "It uses weighted criteria to determine which projects will give us the best benefits: environmental, financial, and social," says laboratory director and sustainability champion Bruce Richart.

The tool was designed by the CH2M HILL Sustainable Solutions Business Group. The ideas come in an annual plantwide brainstorming session. "We started out in 2007 with some of the easier projects, like a recycling program and eliminating polystyrene cups and bottled water," says Richart. "The best ideas come from the people who are closest to the process."

Many of the projects, like lighting efficiency, require no capital cost. "We went out one evening and looked around the facility," says Richart. "We were able to turn off some breakers and switches. That reduced the exterior lighting by 42 percent while still maintaining safety and security." It also reduced sky glow from the plant.

Another noncapital idea improved the treatment process. "One of the biggest ones involved the aeration basins," notes Luther. "We installed automatic controls so the aerators dynamically switch from high-speed to low-speed to maintain a certain level of dissolved oxygen." That has saved an estimated \$13,000 per year in electricity and labor.

Other projects are extremely simple. One suggestion was to acquire zero-emission transportation — an industrial tricycle — for staff to get around the site. "We purchased one in early 2008 to see if the staff would use it," says Richart. "A good percentage of the staff like it, and you get the cardiovascular benefit."

It eliminated a gasoline-powered utility cart, and that led to replacement of another gas-powered cart with an electric model this year, saving 161 gallons of gasoline in the first six months. Beyond the sustainability register, the plant tracks many indicators of sustainability including energy use, transportation, chemical use, potable water consumption, effluent reuse, recycling, and community involvement.

SOLAR DRYING

One of the first things identified in the Running Register of Sustainability was biosolids drying. After a few years of planning, six

Parkson Thermo-System active solar biosolids dryers were installed in spring 2011. The 42- by 204-foot enclosures use the sun for 95 percent of the energy needed to dry biosolids. Four semi-trailers of wet biosolids are reduced to less than one trailer, reducing the amount going to the landfill.

"In the first six weeks, we had diverted 61 tons of biosolids and saved 8,900 gallons of diesel fuel in transportation," says Luther. That saved \$63,000, and the plant now saves about \$1,000 a day. A thermal gas dryer from Fenton was added late in the year, allowing the plant to produce Class A biosolids for beneficial reuse.

A related idea from an employee has made the transportation more cost-effective. "It's hard to get the biosolids out of the back of the truck when you empty it," says Luther. "We were purchasing vegetable oil to coat the box. One of the staff members had the idea of purchasing used oil from a food processing facility. What used to cost \$7 a gallon now costs \$1.25."

HABITAT IMPROVEMENT

Fayetteville is in the northwest corner of Arkansas, in the Boston Mountains of the Ozark range, just outside the Ozark National Forest. A 5.3-acre meadow restoration led to replacement of invasive plants with native wildflowers and grasses.

A larger effort was the 46-acre Woolsey Wet Prairie Sanctuary, now a popular tourist attraction and outdoor classroom. The project restored the area to native plants and habitat that attracts a diverse mix of wildlife.

In addition, an acre of grass in front of the plant has been replaced by a xeriscape garden that needs less watering. The staff at the Paul R. Noland plant has proven that a focus on sustainability doesn't have to mean large capital expenditures to achieve big improvements. **tpo**

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Being Neighborly

BIOTRICKLING REACTORS ENABLE NEW JERSEY TREATMENT PLANTS TO ELIMINATE HYDROGEN SULFIDE ODORS AND GAIN GOOD STANDING IN THE COMMUNITY

By Scottie Dayton

Concentrations of hydrogen sulfide at the headworks of the Rancocas Road Treatment Facility in Mount Holly, N.J., reached 100 parts per million by volume (ppmv) or higher. The staff treated the enclosed building as a confined space.

The headworks, installed in the early 1980s, had no odor control. Aeration of the uncovered grit chamber drove gases into the atmosphere and out a vent 60 feet from the main road into town. During humid weather or on still days, the odor was especially offensive for drivers.

With the aging plant pushing its 5 mgd design capacity and new developments projected to deliver an additional 1 mgd, William Dunn, executive director of the Mount Holly Municipal Utilities Authority, worked with his staff to plan an upgrade to the facility, build a new 3 mgd Maple Avenue plant, and divert some flow to it.

"We still monitor the headworks building for employee safety, but we haven't recorded hydrogen sulfide in that space since inoculating the reactors. We couldn't be more pleased and neither could our neighbors."

JOEL HERVEY



The Maple Avenue facility has two EcoFilter EF 62 biotrickling reactors with 1,030 cfm blowers controlling odors from the headworks.



ABOVE: The EcoFilter EF 124 biotrickling reactor for the sludge storage tank and rotary drum thickener at the Rancocas Road facility has a 4,800 cfm blower.



RIGHT: The bottom module of the EcoFilter unit holds the structured synthetic media in columns separated by airflow channels. The module is the first of three to make up the reactor vessel that will control odors from the tank.

"One priority was making our presence undetectable to our neighbors," says Joel Hervey, deputy director for plant operations. "We had tried dual scrubber odor control systems and a packed-tower scrubber system at the Rancocas Road facility. Neither was very effective, and both were labor intensive. We needed a better mousetrap."

BioAir Solutions won a bid for odor control work with EcoFilter biotrickling reactors. The installation, the largest of its kind in the state, eliminated the odor problem.

FIRST THINGS FIRST

The Rancocas Road facility takes flows from six towns, the farthest 6.5 miles away. Long detention times in the force mains, and flows insufficient to flush them, generate sulfides.

During design, Dunn hired Robert Bowker, P.E., of Bowker and Associates, a consulting firm in Portland, Maine, that specializes in odor control. He sampled points in the collection system and throughout the plant to determine loadings for the new plant

Share Your Idea

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Project engineer Ryan Leary, left, from Allen A. Myers in Worcester, Pa., and foreman Mario Ribau evaluate the odorous air ductwork controlling odors from the sludge storage tank.

in Lumberton. Moving beyond the grit chamber, Bowker identified other odor sources: two sludge storage tanks and a leachate storage tank, both covered.

Based on Bowker's study, BioAir proposed two EcoFilter EF 124 units for the Rancocas Road facility and three EF 62 units for the Maple Avenue plant.

"One EF 124 reactor with 4,800 cfm blower is installed between the headworks and a sludge storage tank and rotary drum thickener, which is a new piece of equipment," says Hervey. "The other reactor with a 4,000 cfm blower is between the leachate storage tank and second sludge storage tank on the opposite end of the plant. The microbes in the second unit also treat some ammonia."

The Maple Avenue facility has two reactors with 1,030 cfm blowers at the headworks and one reactor with a 515 cfm blower at an internal drain pump station. The turnkey units include control panels, piping, blowers, spray nozzles, structured synthetic media, integral airflow channels, and an exhaust stack.

To prepare for their arrival at the Rancocas Road facility, Allen A. Myers, a construction company in Worcester, Pa., installed fiberglass covers on the grit channels, sealed them airtight, and installed piping off the covers. The firm also piped the storage tanks, poured concrete pads for the reactors, and ran water and electrical lines.

INTO ACTION

After Myers set and plumbed the reactors, workers inoculated the media with bacteria from the aeration basin. Plant operators supplemented the microbes with nitrogen and phosphorous to accelerate population expansion.

Myers also installed a temporary pump on each unit to return sloughing biomass in the drain water to the spray nozzle. "Recirculating the water for the first month reduced the inoculation time," says Hervey.

The blowers pull air through manhole covers outside the building, across the odor sources, and into the bottoms of the reactors. As air flows up through the engineered channels, water trickling down captures odorous compounds, and microorganisms on the media oxidize them. Clean air leaves through the exhaust stack.

At regular intervals, a programmable logic controller opens the motorized ball valve in the Eco-Panel, sending effluent at 65 psi to the spray nozzles. "Irrigation keeps the media and microbes moist," says Hervey. "After the water percolates down and flows to the drain, we pipe it into the influent line. The reactor is self-cleaning because sloughing bacteria go out with the water."

GIVE IT TIME

It took one month for the microbes to acclimate to the pollutants at the Rancocas Road facility. "Anything they did was an improvement," says Hervey. Carbon canisters on the headworks at the Maple Avenue facility controlled odors until those reactors were at full capacity.

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mental Protection air permits for the Rancocas Road facility, operators monitor hydrogen sulfide concentrations at the inlets and exhausts weekly. Once a month, they run a one-hour test on the levels. They also monitor airflow levels, ambient temperature, and drain water pH weekly and check the valves and system for leaks daily.

"Because we split our flows, hydrogen sulfide at the Rancocas Road headworks peaks around 20 to 30 ppmv at the inlet and almost zero at the exhaust," says Hervey. "At Maple Avenue, the peak headworks numbers average 5.35 ppmv and almost zero at the exhaust." Third-party testing confirmed that the technology removes 99 percent hydrogen sulfide and ammonia and 95 percent of overall odors.

"It's much more pleasant walking around the Rancocas Road facility now," says Hervey. "We still monitor the headworks building for employee safety, but we haven't recorded hydrogen sulfide in that space since we inoculated the reactors. We couldn't be more pleased and neither could our neighbors." **tpo**



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VISITORS

New Employees

By Briana Jones

As director of utilities for the City of East Chicago, Ind., Pete Baranyai keeps an eye on all the happenings around the treatment plant, including animal activity. These baby raccoons were born on the East Chicago Sanitary District property, right at the doorway to the operations control center. "Maybe they were looking for employment?" says Baranyai.

The great egret and black-crowned night heron can teach the new raccoons a few tips of the treatment plant hunting trade. "Wastewater treatment plants are areas where these types of birds can come in and they're not bothered much by people," says Baranyai. The birds hung around the plant's combined sewer overflow treatment basin waiting for minnows to wash out.

"In the middle of an industrial capital, it's interesting that all these things are able to co-exist," says Baranyai. With current plant inhabitants fending for themselves and future inhabitants already growing up, the East Chicago plant has a full circle of life taking place. **tpo**

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Where the Roads Diverge

WHY ARE ENGINEERS AND OPERATORS OFTEN AT ODDS? THE REASON MAY HAVE TO DO WITH DIFFERENT WAYS OF THINKING AND SEEING THE WORLD

By Ron Trygar, CET

I think there may be an imaginary place — a time or a crossroad of life — where some of us unconsciously decide to take the path toward operations, and others toward engineering. I'd like to share this perspective.

I've worked in the wastewater treatment field 28 years, at a variety of treatment plants in various positions. I have found in common at every facility the negative opinion operators and engineers hold about each other. I've been fascinated (and sometimes disheartened) at the low esteem in which some operators hold engineers, and vice versa.

Not every operator dislikes engineers, and plenty of engineers get along quite well with operators. But it seems these folks are a minority. I've concluded that this may be due to different modes of thinking. Perhaps my experience will illustrate.

STRUGGLES WITH MATH

When I started in wastewater treatment, I found that the algebra I couldn't grasp in high school suddenly made sense, as I could apply it to the world of biomass. Today I teach treatment plant operators and trainees all aspects of the profession, including math, and I really enjoy helping operators 'get it.'

Because I enjoy teaching and learning, I decided to become more proficient as a trainer, especially with chemistry. My wife and I enrolled

and its ability to carry so much weight.

"It's the same if an ant falls off a desk. The desk is thousands of times taller than the ant, but when he lands on the ground, he still goes about his ant business. If a man falls the same proportional distance, he goes splat on the ground. We can explain this mathematically, even though it doesn't seem logical."

REACHING THE FORK

At some random point in life, we may reach a fork in the path of education. I believe that when learning math, a person sees things either logically (like an operator) or conceptually (like an engineer). A person who can think theoretically can see the equations and algebra as they are taught, and the subject comes relatively easy. That's not the case for others.

For instance, when my high school algebra teacher wrote the equation $x = a + b$, and told us to substitute some number for a and b , I was immediately lost: Why not just put the numbers in the equation, instead of using letters? Letters are letters and numbers are numbers, I thought. But most classmates followed along with little to no problem.

It seems that as engineers follow a higher educational path through life, and as operators gain their real-world experience, the division between them becomes greater. At some point, operators begin believing that engineers don't know how to operate a treatment plant and don't have any common sense. Engineers begin believing that operators don't have the same level of education and therefore are not qualified to design a treatment plant, suggest improvements, or make operational decisions.

Operators think engineers won't listen to their ideas; engineers think operators lack the knowledge to understand why some of their ideas won't work. These two cultures exist today and can cause problems with the operation of a treatment plant.

THEORY AND REALITY

An article describing several specific examples of these problems appeared in the December 2010 issue of *TPO* magazine. Written by engineers, plant supervisors and operators, the article included this sentence: "Better communication between operators and engineers can mean more people-friendly treatment plant designs."

A good friend who is an engineer once told me that most engineers are good at math and can calculate almost anything. "Designing a treatment plant to handle a known amount of gallons with a known organic strength, to meet known effluent standards, and to continue to meet these standards at high flows, comes easy to engi-

We obviously have different skill sets, yet each profession depends on the other to accomplish a common task. Communication is a two-way street, and it works best when we listen to what is being said.

at a local college, and now, two nights per week, I sit in class with a few other adult learners, along with students just beginning their college careers.

I find the math is still somewhat difficult and not always clear. During a discussion with our instructor, one student made an analogy using grapes. What he said made complete sense to me, but our teacher said no — he was incorrect because he wasn't following some basic math rules. Specifically, when a number has an exponent of zero, the result is always 1. ($4^0 = 1$, or $50^0 = 1$). As in this case, some math rules don't seem to make sense — but they are the rules.

This was where I happened upon the imaginary breakpoint, or crossroads, between operators and engineers. Operators see things logically; engineers can see things mathematically, or theoretically.

I discussed this concept with my wife and she replied: "Yes, that's right. Think about an ant. An ant can carry many times its own body weight, much more than a human can. It doesn't seem logical that it could, but it can. We can use math to explain the structure of the ant

neers since it is all based in math," she observed.

"But when microbiology is added to this equation, the math gets a little fuzzy. Poor-settling sludge due to bacteriological bulking is difficult to calculate, and therefore the clarifiers might not work as designed."

That's where plant operators seem to excel: They have a unique ability to make the plant work, no matter how it's designed. Operators can literally make or break an engineer's brilliant design. A professional engineer recently shared his view on this: "An aerospace engineer can design a wonderful aircraft, but it takes trained pilots to make the plane fly."

TOWARD COMMON AIMS

So what's the point of all this? If we are to achieve the common goal of clean water and environmental protection, we must all work together. By seeing where we come from and how we arrived at where we are today, we can move forward with a better understanding.

We obviously have different skill sets, yet each profession depends on the other to accomplish a common task. Communication is a two-way street, and it works best when we listen to what is being said.

If we choose to continue with negative opinions of each other and communicate poorly as a result, we all lose, and the environment suffers. So let's begin listening, showing a little respect for each other's profession and opening the lines of communication. In the end, we'll all reap the rewards of well-designed and operated treatment plants that achieve compliance at minimal cost.

ABOUT THE AUTHOR

Ron Trygar is senior training specialist in water and wastewater at the University of Florida TREEO Center and a certified environmental trainer (CET). He can be reached at rtrygar@treeo.ufl.edu. tpo



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Closing the Deal

A CLEVER MARKETING PROGRAM HELPS POMPANO BEACH PERK UP DEMAND FOR ITS RESIDENTIAL REUSE WATER AND BUILD UP THE BASE OF CUSTOMERS

By Ted J. Rulseh

Reclaiming wastewater for reuse in irrigation is a great and increasingly widespread policy. But what if no one is signing up to use the reclaimed water?

The city of Pompano Beach, Fla., faced that challenge in recent years after launching a residential water reuse program to go along with its successful commercial offering. Homeowners were reluctant to sign on because they perceived the up-front connection cost as too high and disliked the headache of contracting for the hookup on their own.

To remedy that, the city turned to a marketing program that combines creative pricing and service with a promotional campaign targeting the limited number of customers in areas where the reuse water distribution system is in place.

The program generated interest almost immediately — within a month and a half after its launch in July, the city (population 104,000) had received nearly 100 requests for reuse water and had more than 50 of them essentially ready to connect.

Don Baylor, the city's water reuse plant superintendent, and Maria Loucraft, lab manager and also charged with special projects, talked about the program, which operates under the banner of "I Can Water," in an interview with *Treatment Plant Operator*.

"We didn't make connections mandatory, and people weren't connecting because of the up-front cost to connect and because of the private site work that had to be done on their property."

MARIA LOUCRAFT

tpo: What is the history of the city's water reuse program?

Loucraft: We call the reclaimed water system OASIS — Our Alternate Supply Irrigation System. Pompano Beach doesn't have a wastewater treatment plant. We send our wastewater to Broward County, and then we take some of the secondary effluent from them as it is headed out toward the ocean outfall. We bring it into our reuse facility, where it receives some additional filtration and disinfection and then use it for irrigation.

Baylor: The Pompano Beach tertiary treatment process uses sand media upflow filters for particulate removal, followed by chlorination. The daily flow of the plant is 2 mgd, the total capacity is 75 mgd, and it has physical capacity to upgrade to 125 mgd.

tpo: Who are the primary reuse water customers?

Baylor: Our long-time customer is the City of Pompano Beach Golf Course, which has two 18-hole courses. We have also watered



Don Baylor and Maria Loucraft with one of the six-foot banners promoting the OASIS "I Can Water" campaign.

median strips around the Pompano Beach airport, as well as several parks and playing fields in that same general area.

tpo: How did the residential water reuse program begin?

Loucraft: A number of years ago, the golf course over-pumped its groundwater wells. When they went to the water management district for their consumptive use permit, they were denied unless reclaimed water could be made available. When the city went in shortly after to ask for its consumptive use permit for the drinking water wells, we were forced to put in a reuse water facility, which we built in 1989.

Part of our consumptive use permit stipulated that we needed to provide irrigation to residential customers. We began building the residential system in 2003, but we didn't get a lot of demand from residential customers.

tpo: Why would you say there was resistance from the residential sector?

Loucraft: We didn't make connections mandatory, and people weren't connecting because of the up-front cost to connect and because of the private site work that had to be done on their property. Besides the connection, they needed backflow prevention and a thermal expansion device. That typically cost from \$500 to \$1,000, depending on layout of property.

We have more than 300 existing customers, including the city accounts and commercial accounts that are required to hook up. But until this year, we only had 73 residential customers. Meanwhile, we are adding about 10,000 feet of pipe per year to the reuse water distribution system, and that translates to about 200 more homes per year that could be brought online. As it stands today, our system could accommodate about 1,200 residential customers.

tpo: What was the thought process behind the "I Can Water" campaign?

Loucraft: On seeing that the customers weren't connecting, the city commission directed us to find a better approach. They allowed us to come up with a new, more creative way to connect those customers.

What we came up with was hiring a contractor who would oversee the work on the customers' private properties, while the city would take care of financing for that and recover it through the reuse water rates structure. So now the up-front cost to homeowners is nothing.

The rate for new connections went up a little bit compared to the rate for existing reuse customers. So to reward those existing customers who had hooked up and paid their own money up front, we are taking over their backflow device so they no longer have to go through annual checks, and we are keeping them at the lower rate.

It's quite a bit of cost to connect each customer, but we also have received a grant from Broward County. They've offered us up to \$220,000 to assist us with the connection costs. So we have partners in this.

tpo: How do the rates for reuse water and potable water compare?

Baylor: The residential rate for existing customers is 61 cents per 1,000 gallons, and the rate for new customers is 84 cents per 1,000 gallons. In both cases there is an additional \$7.88 per month availability fee. Potable water rates start at \$2.24 per 1,000 gallons, and most customers pay an availability fee of \$12.88 per month. Our rates are tiered for conservation and also depend on meter size.

tpo: How was the marketing and promotion campaign put together?

Loucraft: "I Can Water" is the marketing side of the program. That was approved by the commission in July, so we are in the first stages.

The marketing was very important to us because we are pretty much left-brain, technical people here. We needed advice from someone on the outside who thinks more like the public. We hired Environmental PR Group. We described the program to them, and they came up with marketing approaches.

tpo: Why did you choose "I Can Water" as the catch phrase?

Loucraft: We're under water restrictions here in South Florida and we thought that by saying we can actually provide the freedom to water, that would be a catchy way for people to remember the program.

Baylor: People can use reuse water a lot more often than they can use potable water for irrigating their lawns. There's a minimal time frame in which you can use potable water. It's two days a week depending on your address. On the other hand, they can use reuse water any day of the week, except they can't use water between 10 a.m. and 4 p.m. That's the hottest part of the day, and Broward County issued that restriction for the sake of water efficiency.

tpo: What are the components of the promotional campaign?

Loucraft: We have a slide presentation on Pompano Beach local access cable TV. There is a website at www.icanwater.com. We have a hotline where people can call and leave their name and number so that they can be hooked up.

We have sent out three sets of mailers to the eligible customers. Six-foot banners have been placed at strategic locations. There's one at the golf course and one at one of the city customer service centers, and one travels with our presentations. We have a booth at community events, and we're starting a series of homeowner association meetings.

Baylor: We've also issued press releases to local media, and our

utilities director, Randy Brown, has given interviews to local media.

tpo: What has been the cost of the promotional activities?

Loucraft: The marketing program hasn't cost us a lot so far. Even including the development of our Web page, I don't think we have even reached \$30,000.

tpo: How many people are you targeting to connect through this program?

Loucraft: We would love to reach a total of 1,200 residential customers in another two years. Our goal is to reach 750. We would consider 750 a success. That would represent 92.4 million gallons per year in potable water savings from about 700 new hookups, or 0.25 mgd of increase in reuse water distribution.

"If you were to look on a map at the saltwater intrusion line that follows the eastern coast of Florida, you would see that line take a significant dip to the east right where we're supplying this reuse water. This reuse water is actually helping to protect our drinking water supply."

DON BAYLOR

tpo: What has been the reaction to this program so far? What are you seeing in terms of interest?

Loucraft: There is a lot of interest. We have received a lot of calls. People are very eager and excited about the program. We're hoping to keep it running smoothly and keep firing ahead. We hope people don't get impatient with us, because they want it yesterday.

Baylor: We have 52 residential customers for whom we already have plumbers' quotes and are in the queue for connecting. We have another 40 or so who have asked us to contact them with information and pricing.

tpo: Besides the promotional program, what do you think accounts for this increase in acceptance of the residential reuse program?

Loucraft: People are excited because now the connection is being done for them and they don't have the up-front costs. In the past they had to hire their own plumber. A lot of cities still do it that way. This is a bit different. Our goal was to make it no problem at all for the customers. They sign one form that allows us to work on their property, and after that we want no headaches whatsoever for them.

tpo: How do you physically make the connection to the house?

Loucraft: It's connected directly to their irrigation system. We also have to make sure that backflow prevention is installed on the potable side and then an expansion device is installed. For people who don't have irrigation systems, we want to serve them as well, so we have come up with a prototype for a hose bib. Some restrictions go with that. It has to be in front of the home. It has to be lockable. We have to meet the state regulations with it. But that option is there for people who don't have in-ground systems.

tpo: Looking at the bigger picture, are there any other benefits to the residential reuse program?

Baylor: Yes, there is one really good side benefit. If you were to look on a map at the saltwater intrusion line that follows the eastern coast of Florida, you would see that line take a significant dip to the east right where we're supplying this reuse water. We're protecting the groundwater farther to the west, which is where one of our well fields is located. This reuse water is actually helping to protect our drinking water supply. **tpo**

Process Chemistry/ Lab Analysis

By Briana Jones

TWO PARAMETERS

The Thermo Scientific Orion benchtop pH/conductivity multiparameter meter from Environmental Express displays two parameters plus temperature at once and provides measurements in soil and water analysis applications. The meter is easy to set up and delivers long-life performance for R&D and QA/QC applications.

It features a bright, backlit LCD display with ready indication; simultaneous display of pH, mV or ORP and conductivity, plus temperature; a built-in Quick-Start Guide with calibration instructions; automatic or manual temperature compensation to two decimal places; and auto-read/hold function. The meter stores, displays and prints up to 10 methods with individual method password protection. It can operate an autosampler and stirrer probe (sold separately) and is IP54 dustproof and splash proof. **800/343-5319; www.envexp.com.**



Thermo Scientific Orion benchtop pH/conductivity multiparameter meter from Environmental Express



UniFlow Aire-Stream fume hoods from HEMCO Corp.

FUME HOODS

UniFlow Aire-Stream fume hoods from HEMCO Corp. are constructed entirely of chemical-resistant, flame-retardant, nonmetallic composite resins and feature a unitized construction that does not require screws, bolts, rivets or

metallic hardware to assemble. The units have low-flow, constant volume hoods and variable air volume and offer 50 percent energy savings. The hoods are available in widths from 30 to 96 inches and can be equipped with a wide selection of accessories. They are available in bench-mount and floor-mount models, and custom sizes can be modified to suit special needs. Work surfaces and base cabinets are available for each size hood. Process-specific models are PVC, polypro, phenolic or stainless steel-lined for phenolic acid or acid digestion. **800/779-4362; www.hemcocorp.com.**

TREATMENT ADDITIVES

Hydrex water treatment additives from Kruger USA, part of Veolia Water, include a wide range of chemicals formulated for most applications. The line is categorized in product series (1000-9000) and includes solutions suitable for drinking water and wastewater treatment. A global support team provides amalgamation of chemistry and equip-



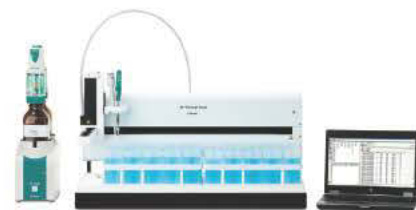
Hydrex water treatment additives from Kruger USA

ment technology. Hydrex professionals offer state-of-the-art complete carbon footprint assessments and ecoGreen alternatives. **919/677-8310; www.krugerus.com.**

SAMPLER CHANGER

The 898 XYZ sampler changer from Metrohm USA is an XYZ automate for analysis of large sample series. Measurements and titrations are carried out directly in the sample vessels. Controlled by tiamo software, the unit fits 82 samples with the ability to change racks during operation.

The sampler can be operated with various sample racks and many applications can be directly automated. As the racks are split into two, racks with the next batch can be inserted while the samples are running. The software allows users to simply place the samples and enter sample data. Or users can enter the data with a barcode reader or balance. After the start signal, the whole batch is automatically processed. **800/727-6768; www.metrohmusa.com.**



898 XYZ sampler changer from Metrohm USA

SULFIDE DETECTOR TUBES

The Gastec Sulfide Ion in Solution Detector Tube No. 211 from Nextteq provides a quick and easy method for detecting sulfide ion levels in solution. No technical training is necessary to perform the test accurately. The detector tubes are available in four ranges for specific measuring, with a total range of 0.5 to 1,000 parts per million. No mixing of chemicals is required.



Gastec Sulfide Ion in Solution Detector Tube No. 211 from Nextteq

The direct-reading tubes produce a quantitative color-stain that pinpoints problem areas in two to three minutes. The calibration scale, printed directly on each tube, provides easy-to-read, on-the-spot results. The tubes save time by avoiding laboratory turnaround time. No color comparison chart or laboratory equipment is necessary to determine results.

The color-stain ends with a clearly defined line of demarcation. **877/312-2333; www.nextteq.com.**

PORTABLE MULTIPARAMETER METER

The handheld portable Series 150 multiparameter electrochemistry instrument from Orbeco-Hellige measures pH/Redox, dissolved oxygen and conductivity/TDS. The unit's intuitive interface makes it easy to use, and its large display makes it easy to read. It has an RS232 and USB connection that allows the user to transmit stored data to a computer. The instrument is supplied with electrodes, buffers and accessories. **800/922-5242; www.orbeco.com.**



Series 150 multiparameter electrochemistry instrument from Orbeco-Hellige

HORIZONTAL FLOW SAMPLER

The Swing Sampler from Nasco is designed for collecting samples from horizontal flowing streams, checking effluent going through an underground pipeline and sampling where several sewers intersect. The 960 ml high-density polyurethane bottle holder pivots to allow collection



**Swing Sampler
from Nasco**

from any angle. The adjustable fiberglass pole extends from 6 to 12 feet (Model B01310) or from 8 to 24 feet (Model B01366). Aluminum threads on the end of the pole and a nylon adjustable locking ring hold the bottle in place. The bottle includes a plastic cover that contains a vinyl liner for a tight fit. **800/558-9595; www.whirl-pak.com.**

SYNERGISTIC TREATMENT

PRI-SC (peroxide regenerated iron-sulfide control) from US Peroxide is a combination treatment that integrates iron salts with hydrogen peroxide in a synergistic and cost-effective way. The treatment involves adding an iron salt at the upper reaches of the collection system and using hydrogen peroxide to regenerate (oxidize) the spent iron at one or more points downstream, each time yielding fresh ferrous and ferric iron for subsequent treatment.

Incorporating a final regeneration site provides rapid oxidation of sulfides to very low levels, reducing the hydrogen sulfide loading to the influent scrubbers, and hydrous ferric iron that can be used for additional odor control. The process works with gravity interceptors, force main discharges and headworks treatment. **877/346-4262; www.h2o2.com.**



**PRI-SC (peroxide regenerated
iron-sulfide control) from US Peroxide**



**Sampling cabinet from
Sentry Equipment Corp.**

SAMPLING CABINET

The heated, insulated sampling cabinet from Sentry Equipment Corp. is constructed of 2-inch-thick foam insulation encapsulated in stainless steel sheet metal. The cabinet interior is seal-welded and the bottom sloped to a drain port that leads to the site's oil and water sewer. These features aid in the cleanup of any spills inside the cabinet. An explosion-proof heating system maintains a temperature of 50 degrees F inside despite external freezing temperatures.

The exterior features a drip edge to prevent rain, snow and ice from penetrating the seal around the door, which is equipped with a three-point latch system. An external switch allows the heater to be turned off before opening the cabinet. Cabinets can be made to incorporate nitrogen inlets and vents to purge the cabinet of any volatile organic compounds. **262/567-7256; www.sentry-equip.com.**

SEASONED SAMPLER

The All Season Sampler from QCEC offers low ownership cost and reduction in heat loss due to the high-R-factor construction. There are no sample tubes to replace and no maintenance or rebuilding is necessary. The sampler has an additional option that monitors each sample and provides accurate sample sizes to within 4 ml. It pulls up to a 300-foot horizontal draw and 28-foot head. The dual version can sample two locations with just one sampler. It uses the same refrigeration module as commercial machines, providing rapid and cost-effective temperature drawdowns. **515/266-2268; www.qcec.com.**



All Season Sampler from QCEC



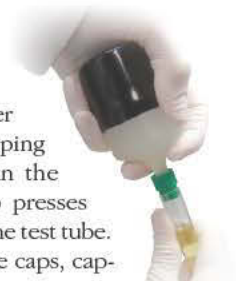
**934-AH borosilicate glass fiber
filter from Sterlitech Corp.**

GLASS FIBER FILTER

The 934-AH borosilicate glass fiber filter from Sterlitech Corp. establishes water quality in suspended solids content and meets all criteria for measuring suspended solids in water and wastewater as determined by Standard Method 2540D and EPA Method 160.2. The binderless borosilicate microfiber enables use with volatile suspended solids and other samples up to 1,022 degrees F. The filter features 1.5-micron particle retention and is available in a variety of diameters. **877/544-4420; www.sterlitech.com.**

BEL-ART SCIENCEWARE TEST TUBE CAPPER

The Scienceware test tube capper from Bel-Art Products eliminates hand and finger fatigue that can be caused by the repetitive capping of test tubes. A vinyl-covered handheld fits in the palm of the hand while a polypropylene tip presses down on the cap to securely position it within the test tube. Designed for use with recessed center test tube caps, capping can be performed on glass or plastic test tubes. **800/423-5278; www.belart.com.**



**Scienceware test tube capper
from Bel-Art Products**



Microcat-XNL from Bioscience

AMMONIA FIGHTER

Bioscience offers a formulation of pre-selected Nitrosomonas and Nitrobacter microbial strains for use in biological wastewater treatment plants receiving wastes containing ammonia. Microcat-XNL is a nonrefrigerated liquid. Microcat-XNC is a refrigerated slurry concentrate of the same composition that can be used at rates

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Alliance Water Resources, Sedalia, Mo.

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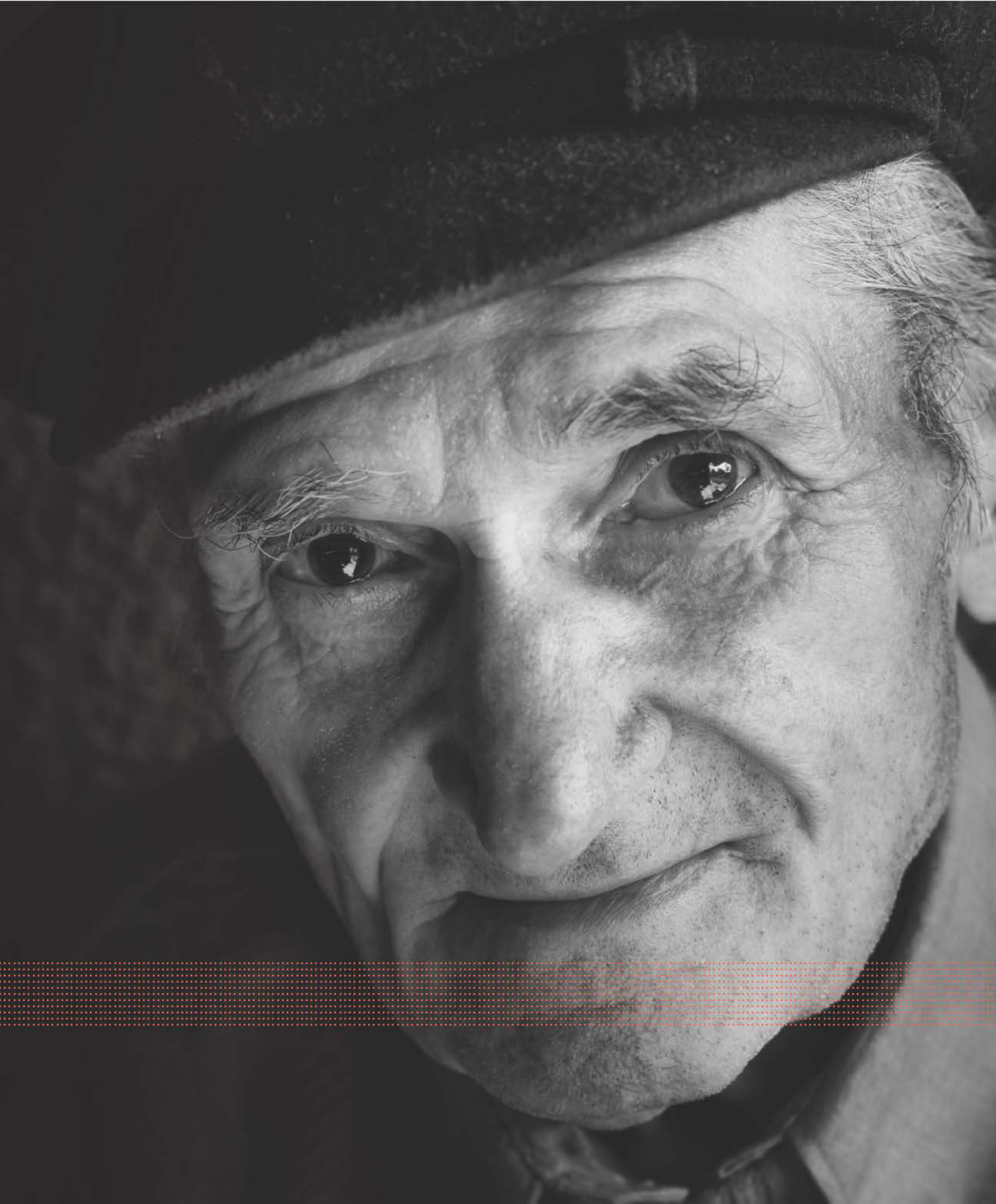
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Formulation consumes organic solids

Problem

Biosolids buildup in the anaerobic lagoons at the Mount Olive (N.C.) Wastewater Treatment Plant was lowering storage capacity.

Solution

Operators removed up to one-half of the biosolids with conventional equipment, then added **ASI Maintenance Plus formulation from Agriment Services** to remove another 25 percent. Each one-pound package contains nonpathogenic bacteria that digest and liquefy solids, reduce odors and control insects. The water-soluble packs are introduced directly into the lagoons.

RESULT

The lagoons' storage capacity was restored along with the biological health of the waste management system. **252/568-2648; www.agrimentservices.com.**



Probes recognize testing parameters

Problem

Membrane-style dissolved oxygen meters at the Loveland (Colo.) Wastewater Treatment Plant were time-consuming to set up, maintain and calibrate. Drifting test results made measurements unreliable.

Solution

The plant purchased the portable **HQd meter with luminescent dissolved oxygen (LDO) probe from Hach**. An intuitive user interface with guided self-calibration reduces calibration errors.

Besides measuring dissolved oxygen, different IntelliCAL plug-and-play probes simultaneously measure other parameters such as pH and ammonia. The probes store the last known calibration and the calibration history, reducing the need to recalibrate when moving from one meter to another. LDO technology eliminates membranes.

RESULT

Loveland runs five tests in the time it took to run one test with the older system, and the results are accurate. **800/227-4224; www.hach.com.**



Meters improve field utility

Problem

The laboratory team from Greene County Sanitary Engineering in Beavercreek, Ohio, conducted monthly sampling on the Little Miami River and Massie Creek to monitor the county's two wastewater treatment plants and comply with NPDES reporting requirements. Members carried separate meters for pH and dissolved oxygen (DO). Some sites were difficult to sample.

Solution

The team chose the **Professional Plus handheld multiparameter meter from YSI**. The Quatro cable allows them to measure pH, DO, and temperature quickly and reliably. The meter also measures oxidation reduction potential, conductivity, ammonium, and nitrate or chloride.

RESULT

The team even used the meter for testing BOD in the laboratory. **800/897-4151; www.ysi.com.**



other case studies

Vortex grit chamber enhances removal

Problem

The upgrade and expansion of the Soledad (Calif.) Wastewater Treatment Plant included a high-performance vortex grit chamber in the headworks. To prevent finer grit from wearing out pumping equipment, accumulating in clarifiers, and contaminating biosolids, officials looked for a grit removal system.

Solution

The facility installed the **Mectan V variable-angle grit removal and separator from John Meunier**. The tangential inflow velocity along the peripheral wall of the circular chamber helps remove grit. Paddles in the chamber maintain velocity, holding solids in suspension. As grit settles down the sloped transition between the upper chamber and grit well, circular and conical shapes reduce turbulence. A 360-degree flow path with separator plate ensures no short-circuiting. Air or water scours the bed of the well to fluidize the material before a pump or airlift transfers it to the classifier.



RESULT

Field tests revealed that the system removed more grit for each particle size analyzed than the specification requirements. The grit removal rate remains consistent for all flows. **888/638-6437; www.johnmeunier.com.**

Scrubber transforms gases

Problem

As an operator at the Moccasin Bend Wastewater Treatment Plant in Chattanooga, Tenn., tried to switch 1-ton chlorine cylinders, a leak occurred. The worker escaped without injury as the facility implemented its emergency response plan.

Solution

Officials purchased a FOC-1 fiberglass emergency gas scrubber with **Chlorosorb dry-scrubbing medium from Purafil ESD** and installed it next to the chlorination room. The media neutralizes 400 pounds of chlorine in the first minute and additional gas at 80 pounds per minute thereafter. The chemisorptive process traps chlorine inside pellets where an irreversible chemical reaction changes the gas into a harmless solid.



RESULT

"The scrubber neutralized all the chlorine that leaked out," says Jerry Stewart, director of Water Resources. "It turned a potentially major incident into a minor one, enabling us to shut off the gas before it escaped to surrounding areas." **800/222-6367; www.purafil.com.**

Cloth media filters improve performance

Problem

Intermittent flows from the Bear River Casino caused the continuous backwash sand filters at the Loleta (Calif.) Wastewater Treatment Plant to use much of the backwash effluent during low flows. Periodically, the filters even ran completely dry, causing maintenance issues and poor filtration.

Solution

In 2010, the plant purchased an **FFP-90403 fixed-plate filter from Fluidyne Corp.** to replace the sand filters. The FFP has four small cloth panels, each with three square feet of acrylic media, and no moving parts or pumps.



RESULT

The unit has a much smaller footprint than the sand filters, increased the system's ability to handle peak flows, and minimized backwash during off-hours. **319/266-9967; www.fluidynecorp.com.**

Filter reduces reject flow

Problem

Because the Pompano Beach (Fla.) Water Reuse Facility paid to process reject flow from the Dyna-Sand continuous backwashing sand filter, officials looked for ways to reduce the volume of backwash water and optimize filter performance.

Solution

In a test project, workers converted one sand filter cell with an **EcoWash filter from Parkson** and left the other in its standard setup. The intermittent washing cycle in the test cell improved performance and shortened reject periods.



RESULT

The baseline reject flow averaged 28,800 gpd and the test cell averaged 2,880 gpd. The facility also saw a significant power savings due to the compressor's reduced run times. Officials installed the system in the remaining cells. **954/974-6610; www.parkson.com. tpomag.com**

people/awards

The **Fiesta Village Advanced Wastewater Treatment Plant** (Lee County, Fla.) received the Florida Water Environment Association's 2011 Earle B. Phelps Award in the advanced wastewater treatment plant category. The award honors wastewater treatment plants that have maintained the highest levels of pollutant removal.

The **Wastewater Treatment Division of the City of Raleigh Public Utilities Department** received a Platinum Peak Performance Award from the National Association of Clean Water Agencies.

Metropolitan Council Environmental Services (St. Paul, Minn.) received a Gold Award from Xcel Energy for the highest electrical savings of all the utility's large commercial and industrial customers in an eight-state area.

The **North Liberty Membrane Bioreactor Wastewater Treatment Plant** received the Outstanding Civil Engineering Project Achievement Award from the Iowa Section of the American Society of Civil Engineers.

CH2M HILL received the WaterReuse International Award from the WaterReuse Association for the Luggage Point Advanced Water Project (Australia).

TPO welcomes your contribution 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.

education

Michigan

The Michigan Water Environment Association has a Wastewater Administrators seminar in Frankenmuth Jan. 19-20. Visit www.mi-wea.org.

Texas

The Texas Water Utilities Association has these courses:

- Jan. 24 – Basic Wastewater, Longview
- Feb. 14 – Distribution, Longview
- Feb. 29 – Safety, Mineola
- March 13 – Wastewater Collection, Carrollton
- March 19 – Management, Texarkana
- March 20 – Safety, New Braunfels
- March 27 – Safety, Longview

Visit www.twua.org.

Utah

The Water Environment Association of Utah has a Biosolids 101 seminar on Feb. 15. Visit www.weau.org.

treatment plant operator
tpo
Have you seen the **tpo** E-Zine?
Go to tpomag.com to view the e-zine.

CALENDAR OF EVENTS

Jan. 22-25

New England Water Environment Association Annual Conference and Exhibition, Boston Marriott Copley Place Hotel. Visit www.newea.org.

Jan. 30-Feb. 2

Water Environment Federation Utility Management Conference 2012, Hyatt Regency Miami, Fla. Call 703/684-2441 or visit www.wef.org.

Feb. 5-8

New York Water Environment Association Annual Conference and Exhibition, New York Marriott Marquis. Visit www.nywea.org.

Feb. 7-8

Michigan Water Environment Association and Michigan Section of the American Water Works

Association Joint Expo, Lansing Center. Call 517/627-0913 or visit www.mi-wea.org.

March 13-14

Georgia Association of Water Professionals Industrial Conference & Expo, Callaway Gardens Convention Center, Pine Mountain. Visit www.gawp.org.

March 19-22

Illinois Water Environment Association and the Illinois Section of the American Water Works Association Joint Annual Conference, Crowne Plaza Hotel, Springfield. Visit www.iweasite.org.

March 24-28

Missouri Water Environment Association Annual Conference, Osage Beach. Visit www.mwea.org.

Virginia

The Virginia Water Environment Association has an Industrial Waste and Pretreatment seminar March 5-6 in Charlottesville. Visit www.vwea.org.

Water Environment Federation

The WEF has a Wastewater Treatment Modeling seminar Feb. 26-28 in Mont-Sainte-Anne, Quebec. Visit www.wef.org or www.modeleau.org/WWTmod2012.

Wisconsin

The Wisconsin Department of Natural Resources is offering these courses:

- Feb. 1-2 – Ponds and Lagoons: Introduction and Advanced, Fennimore
- Feb. 6-10 – General Wastewater Treatment: Introduction and Advanced, Madison
- Feb. 21-22 – Anaerobic Digestion: Introduction, Burlington
- Feb. 23 – Anaerobic Digestion: Advanced, Burlington
- Feb. 27-29 – General Wastewater Treatment: Introduction and Advanced, Green Bay
- March 6-7 – Ponds and Lagoons: Introduction and Advanced, Manitowoc
- March 13-14 – Disinfection: Introduction and Advanced, Green Bay
- March 19-23 – General Wastewater Treatment: Introduction and Advanced, Chippewa Falls
- March 26-27 – Mechanical Sludge Handling: Introduction and Advanced, Oconomowoc

Visit www.dnr.state.wi.us.

The University of Wisconsin Department of Engineering-Professional Development is offering the following courses:

- March 26-27 – Upgrading Your Sanitary Sewer Maintenance Program, Madison
- March 28-30 – Wastewater Pumping Systems and Lift Stations, Madison

Visit www.epdweb.engr.wisc.edu.

The Wisconsin Wastewater Operators Association has a Spring Biosolids Symposium March 21 in Stevens Point. Visit www.wwoa.org. **tpo**

TPO invites your national, state, or local association to post notices and news items in the Worth Noting column. Send contributions to editor@tpomag.com.

ITT Spins Off Xylem and ITT Exelis

ITT Corp. established Exelis Inc., the company's defense and information solutions business, as ITT Exelis and Xylem Inc., its water technology services business, as distinct, publicly traded companies. All three companies will be listed on the New York Stock Exchange. ITT shares will continue to trade under the ticker symbol ITT. Exelis shares will trade under XLS and Xylem shares will trade under XYL. The company also announced a new board of directors. Frank T. MacInnis was named chairman. Other ITT board members include G. Peter D'Aloia, Donald DeFosset Jr., Christina A. Gold, Paul J. Kern, Linda S. Sanford and Markos I. Tambakeras.



Michael Heitmann

Garney Construction Acquires Weaver, Names COO

Garney Holding Co. acquired Weaver General Construction of Englewood, Colo. Weaver specializes in the construction of water and wastewater facilities with an emphasis in construction management-based delivery. Garney, which specializes in the construction of water and wastewater pipelines, treatment facilities, pumping stations, water storage tanks and industrial projects, also named Michael Heitmann president and chief operating officer. He will oversee strategic planning and business development from the company's Kansas City, Mo., headquarters.

Pall Named a Top Green Company

Pall Corp. was named one of the greenest companies in the United States by *Newsweek* magazine. The filtration, separation and purification business ranked fifth in the capital goods sector and 69th on the magazine's U.S. 500 List. The rankings assess the environmental performance of the world's largest publicly traded companies.

Neptune Corporate Brochure Available

The Neptune Chemical Pump Co. chemical metering pumps, chemical feed systems and chemical injection accessories corporate product brochure can be downloaded in PDF format at www.neptune1.com/pumps/images/genbull.pdf.



Hach Announces BIG Picture Winners

Cranberry Brush Creek Wastewater Treatment Plant, a municipal wastewater facility, and Arkema Inc., producer of industrial chemicals, each were awarded \$50,000 in Hach equipment based on their submissions to Hach's BIG Picture contest.

Schwing Bioset Receives U.S. EPA Approval

The U.S. Environmental Protection Agency approved Schwing Bioset's process that reduces operating temperatures from 158 degrees F to 131 degrees F as a way to further reduce pathogens. Operating at the lower temperature results in a 20 percent reduction in operating costs. The technology process continuously converts municipal biosolids into a Class A/EQ saleable product in full compliance with 40 CFR Part 503 Rule. **tpo**

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1. LMI CHEMICAL METERING PUMP

ROYTRONIC EXCEL Series AD chemical metering pumps from LMI Milton Roy, a Hamilton Sundstrand company, feature microprocessor control options and electromagnetics to meet all flow/pressure ratings. Pumps are available for applications up to 250 psi with capacities between 0.002 and 2.0 gph. Push-button controls for stroke speed and mode, LCD user interface, stroke adjustment and a low level float switch connection are available. Select models include a graphical display, alarm modes, external control options, pulse divide/multiple modes, pulse and 4-20 mA input and output connections, dual low level switch connection, universal voltage and advanced electronic features for pump configuration. 215/441-0800; www.miltonroy.com.

2. PROMATION NONSPRING RETURN ACTUATORS

P9-13 Series, quarter-turn electric, nonspring return actuators from ProMation Engineering feature an industrial-grade design for use with all ball and butterfly valves or dampers requiring higher torque outputs from 17,500 inch-lbs to 40,500 inch-lbs. Other features include self-locking hardened steel drivetrain, mechanical end-of-travel stops and clutch-free manual override for single-handed positioning of the actuator in any direction. 352/544-8436; www.promationci.com.

3. SJE-RHOMBUS REMOTE MONITORING SYSTEM

I-Link Cellular RTU and I-Link WebPortal remote motoring systems from SJE-Rhombus use an integral, cell-based communications gateway to provide two-way communication for monitoring pump lift stations and other water or wastewater pumping applications. The system con-

sists of the I-Link 100 or 200 Cellular RTU hardware interface and customized data access through the I-Link Web portal that provides real-time system information, including monitored equipment, administrative services and report generation. The system can be installed in new control panels with retrofit units available. 888/342-5753; www.sjrhombus.com.

4. DUPERON FLEXRAKE DEBRIS CLEANER

The Model FPFS FlexRake with Thru-Bar technology from Duperon ensures scrapers fully penetrate the bars and that horizontal cross members are cleaned on three sides, eliminating wrapping and clinging debris. Features include an energy-efficient operating speed of 0.5 rpm, which allows scrapers to discharge once per minute for reduced head-loss and slot velocity, as well as minimizing debris accumulation. 800/383-8479; www.duperon.com.

5. BREDEL HIGH-FLOW SLUDGE PUMP

The SPX100D hose pump from Breidel is designed for challenging sludge applications. Using no valves, seals or rotors in the product stream, the pump can run dry and handle high grit or air entrained sludge. The pump handles flows to 400 gpm. Features include self-loading design, easy access to shims and shoes. Discharge pressure reaches 232 psi and operating speeds reach 30 rpm for continuous use and up to 38 rpm for intermittent use. Materials are fully contained within the hose element and don't come in contact with moving pump parts. No drive realignment or off-site rebuilding of the pump is required. 800/282-8823; www.wmpg.com.

6. BLACKMER SYSTEM ONE

System One centrifugal pumps and reciprocating gas compressors from Blackmer are made for high-volume, severe-duty applications in the water and wastewater industries. Features include a stiffer heavy-duty shaft and larger bearings. The units are available in four frame variations: heavy-duty Frame S delivers up to 450 gpm, Frame A and LD17 reach capacities of 1,400 gpm, while Frame M offers a centerline mount for high-temperature applications with right- or left-side discharge. **616/241-1611; www.blackmer.com.**

7. ELECTROSWITCH TIME DELAY CONTROL RELAY

The time delay control switch relay from Electroschwitch mitigates arc flash danger in local circuit breaker operation by allowing for manually initiated time-delayed trip or close. A flashing LED notifies the operator of the pending trip or close operation and serves as a warning to evacuate the arc flash area. Once a local trip or close is initiated, the 10-second delay allows an operator to cancel the pending operation. To avoid inadvertent operation, control push-buttons must be depressed for four continuous seconds to activate the 10-second delay. Other delay time options are available. No special wiring is required for installation. **781/335-5200; www.electroschwitch.com.**

8. SCHWEITZER ETHERNET SECURITY GATEWAY

The SEL-3620 Ethernet security gateway from Schweitzer Engineering Laboratories Inc. features enhanced firewall and access control for substations and industrial environments. The software offers centralized, user-based access controls to serial intelligent electronic devices, Ethernet IDs and protection devices downstream of the SEL-3620 without disturbing existing configurations or requiring infrastructure upgrades. The program also generates complex passwords and adds automatic password management that supports regular IED password changes on a user-configurable schedule or on a triggered basis. **509/332-1890; www.selinc.com.**

9. FLOWWORKS GRAPHIC EDITING TOOLS

Data editing and analysis tools from FlowWorks Inc. enable users to highlight data directly on time-series, scatter graphs or in tables, then flip to an editing screen. Notes and editing history are saved so reverse changes can be made if needed. The FlowWorks Web platform collects data directly from SCADA systems, USGS and NOAA environmental stations. Designed to manage water, sewer, rainfall and other remote data, it can perform CSO event analysis and alarming and I&I and rainfall IDF analysis. FACE real-time data collection tools enable users to create new data channels from incoming data using equations, logical statements and advanced mathematical functions. **206/859-6999; www.flowworks.com.**

10. NRP MULTIGAS SCRUBBERS

NRP 90 and NRP 135 air scrubbers from NRP Products LLC are designed to remove H₂S, ammonia and mercaptan odors from manholes, lift stations, pump stations and confined spaces. The NRP 90 has a 55 cfm suction system, built-in gas sensor to regulate on/off mode for H₂S levels, filtering and scrubbing media and battery or AC operation, while the NRP 135 has a 135 cfm suction system. Both scrubbers use activated carbon for filtering and permanganate for scrubbing. **316/303-0505; www.nrp-inc.com.**

11. WAHL HEAT SPY THERMO IMAGING CAMERA

The Heat Spy high-speed 30 Hz, 160 by 120 pixels thermal imaging camera from Wahl Instruments Inc. is available in two series with 16 different configurations. The z30 series Detector is designed for on-the-spot maintenance inspections and repair. The z50 series Inspector is designed for users required to document and prepare reports. The upgradable camera eliminates the need to buy multiple units for different applications. The z30 model features 11 languages, four color palettes, C, F or K

degree measurement scales, hot/cold seeking and two fixed spot measurements. The z50 offers an additional seven color palettes (11 total), built-in emissivity table for easy lookup, measurement offset correction, digital camera and image storage via SD card. **800/421-2853; www.palmerwahl.com. tpomag.com.**

product spotlight



ScrewactorHD
from Headworks

Conveyor/Compactor Keeps Screenings from Clogging Plant

By Ed Wodalski

The ScrewactorHD heavy-duty shafted spiral conveyor/compactor from Headworks can bust, crush and tear up materials such as fired clay brick, blocks of oak, baseball bats, beverage cans and bottles, tires, traffic cones and buckets of gravel.

"This is a little more heavy-duty to handle things in wastewater that wouldn't be considered typical screenings, like rocks, bricks, pieces of wood and irregular-shaped objects that are difficult to convey," says Wayne McCauley, senior projects and special projects manager. "It takes those materials and breaks them when necessary into smaller pieces."

McCauley says one problem treatment plants face, especially those with older collection systems, is inorganic solids entering the system, or pieces of the system itself, such as a brick-lined sewer, breaking down and getting caught. "At some point you need to retrieve and dispose of it," he says.

The low-profile conveyor/compactor (about 6 feet long and 3 feet wide) can handle about 105 cubic feet per hour and is easily retrofitted to existing systems. Solids are fed directly into the shafted spiral from one or two bar screens and then conveyed through the wash zone on the way to the press zone where they are dewatered and compacted. A trumpet-shaped discharge tube provides additional dewatering and directs solids to a roll-off container.

Below the drain section, a U-trough with quick-release clamps collects the presswater. Two rotary shaft seals keep the presswater inside and away from the greasable axial thrust bearing and drive. When an overload is detected, the unit shuts down and an alarm is sent.

The unit is manufactured from grade 304 or 316 stainless steel, and the spiral shaft is made of alloy steel. System maintenance is minimal, mainly limited to the wear bars and the gear reducer, which typically requires an annual oil change. Options include a screenings washing system that loosens and emulsifies organic material on the screenings and a continuous bagging module that collects screenings. **713/647-6667; www.headworksusa.com.**

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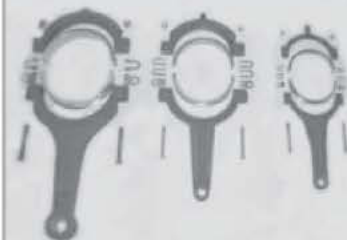
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The screenshot shows the tpomag.com website interface. At the top, there's a navigation bar with links like 'NEW EQUIPMENT', 'CLASSIFIEDS', 'ARTICLES', 'ADVERTISING', 'INTERACT', and 'SUBSCRIBE'. Below this, there are several featured ads, including one for 'Fairbanks Morse' pumps, a 'School Year-Round' ad, and a 'Wastewater Treatment Plant' ad. The bottom section includes an 'Editor's Blog' and 'Industry News'.

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