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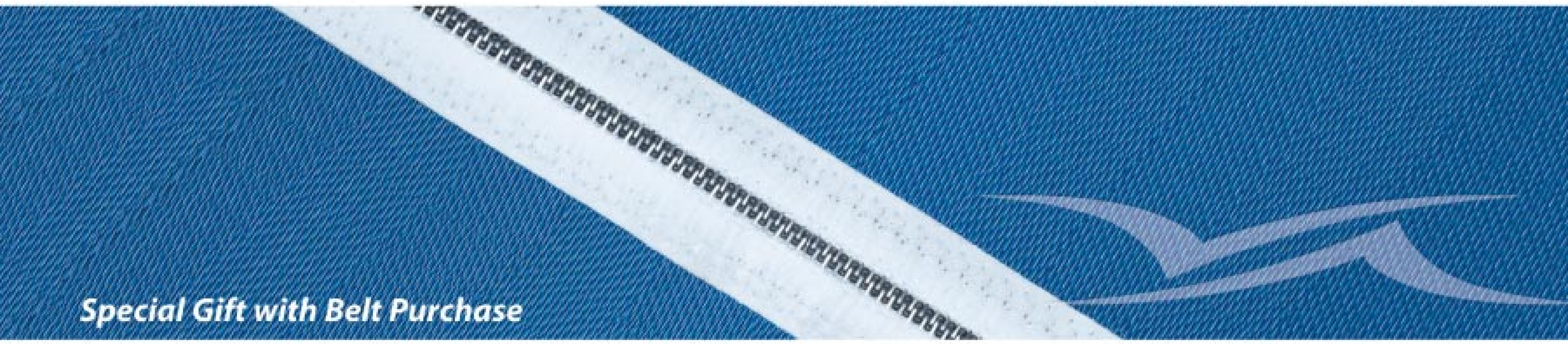


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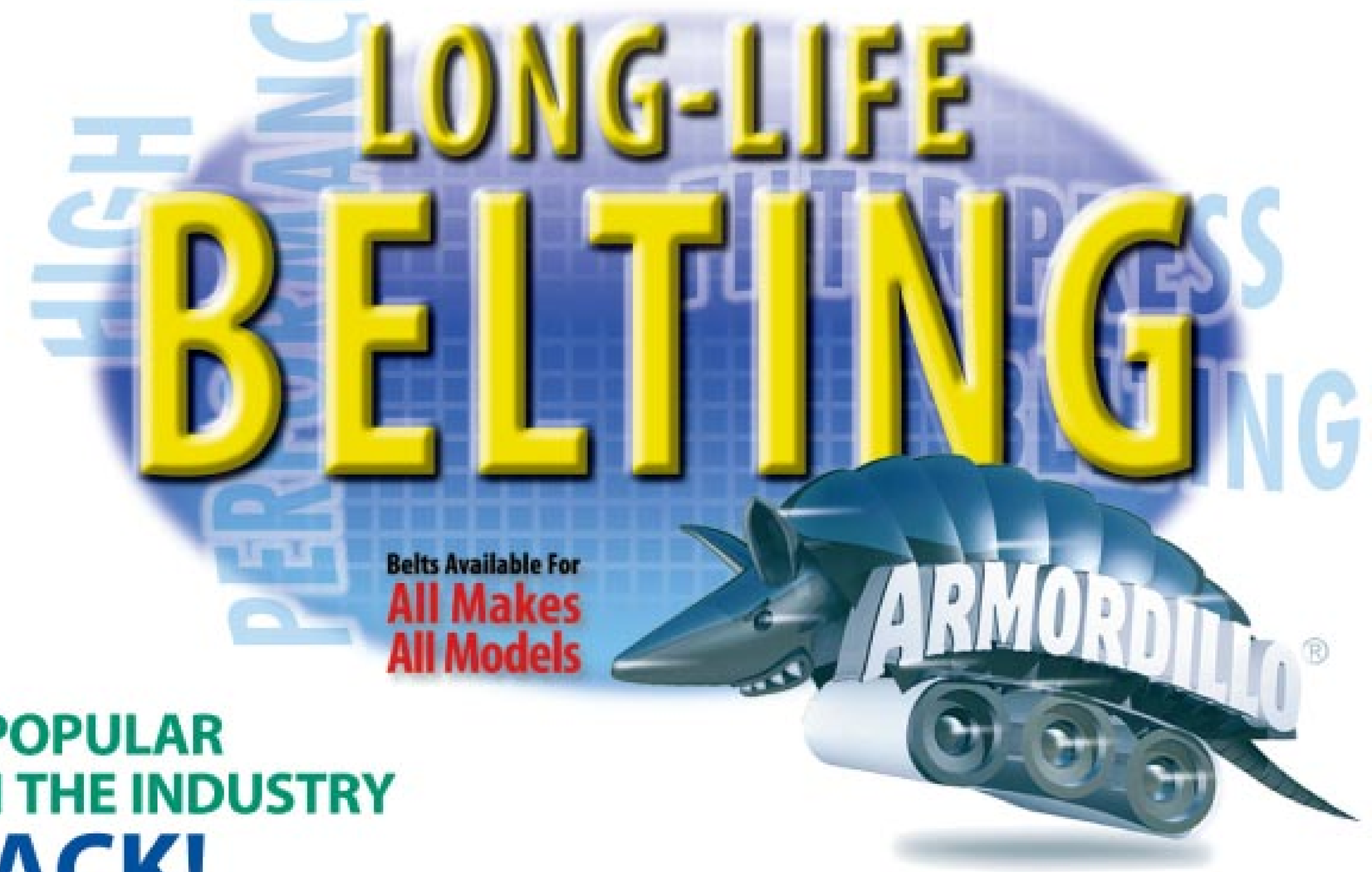


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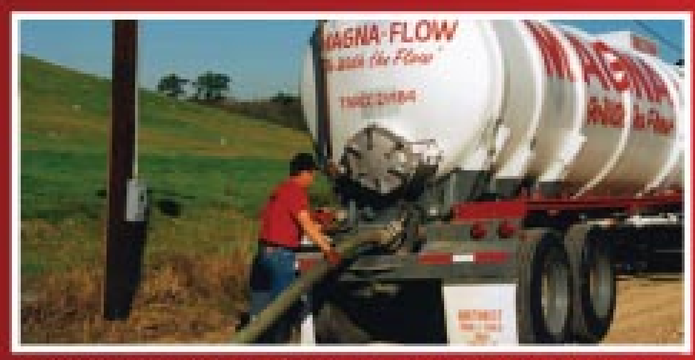


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NOVEMBER 2010






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Published monthly by:

COLEpublishing

1720 Maple Lake Dam Rd., PO Box 220
Three Lakes WI 54562

www.tpomag.com





In U.S. or Canada call toll free 800-257-7222
Elsewhere call 715-546-3346
E-mail: info@tpomag.com
Web site: www.tpomag.com
Fax: 715-546-3786

Office hours Mon.-Fri., 7:30 a.m.-5 p.m. CST

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**REPRINTS AND BACK ISSUES:** Visit www.tpomag.com for options and pricing. To order, call Jeff Lane at 800-257-7222 (715-546-3346) or e-mail jeffl@colepublishing.com.

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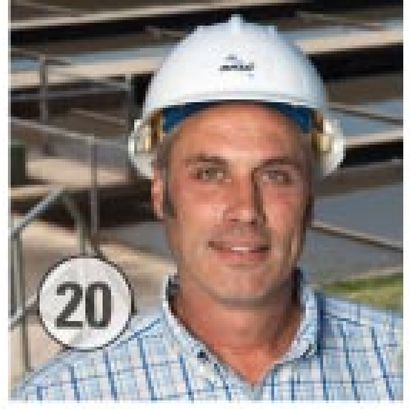
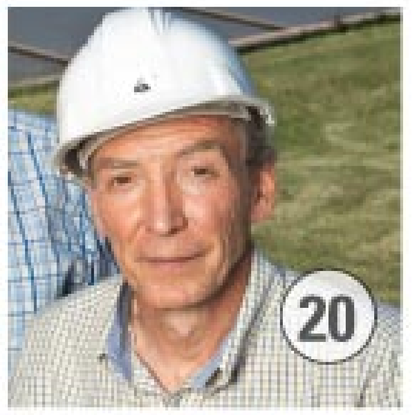
## features








## departments



**COMING NEXT MONTH:** DECEMBER 2010

**Product Focus: Energy Management and Renewable Resources**

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- Top Performer – Plant: Suffield (Conn.) Water Pollution Control Authority
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- How We Do It: Lagoon aeration in Parsons, W.V.
- PlantScapes: Extensive native plantings at Bonita Springs Utilities
- Greening the Plant: Microturbine technology in Albert Lea, Minn.
- In My Words: Infrastructure education in Minnesota
- Hearts and Minds: Student outreach in Mandeville, La.

### on the cover

When several key managers at the Fox River Water Reclamation District took early retirement, the remaining managers stepped up and made the organization even stronger. They include Ed Brown (left), chief operator, and Doug Haacker, superintendent, at the district's South Plant. (Photography by Rob Hart)

let's be clear

# 'Who Are We Exactly?'

TO HAVE A BRAND, YOU DON'T NEED TO BE A HUGE AGENCY WITH A NINE-FIGURE BUDGET. A FEW SMALL BUT WELL-CONSIDERED TACTICS CAN WORK WONDERS.

By Ted J. Rulseh, Editor

So the District of Columbia Water and Sewer Authority changed its name to DC Water and spent $180,000 on a branding campaign (see the "Hearts and Minds" article in this issue of *TPO*).

Must be nice to have that kind of money, eh? And time? Why, if your smaller community spent money on anything as frivolous as branding and public visibility, you'd get pilloried in the local press, right? Exercise in image polishing. Waste of public money. And all that.

Maybe you think that way and maybe you don't. Whatever. Let's stop for a moment and consider why branding can be one of the most important things your clean-water plant or wastewater department can do — and how you can do it with reasonable effectiveness and quite inexpensively.

## WHY HAVE A BRAND?

A brand has a simple purpose: To create in customers' minds a single, positive impression of an organization and what it does. Think Harley-Davidson. Campbell's Soup. Coca-Cola. Ford. Apple Computer.

Of course, it took years, zillions of dollars, and great products to create those brands. You can't build a brand that strong on a shoestring. But the basic idea is for customers to know at a glance who you are and what you stand for — or simply to know you're there at all. That much you can do.

You might ask, "Who cares? What's wrong with just doing a great job and keeping a low profile?" Nothing, maybe, until it's time to convince the public to spend big money for a plant upgrade.

Or until something bad happens, and then you become known simply as the people who caused the big overflow — the villains — because when it happened you had no bank account of good will to draw upon, no visible record of solid public service on which to stand. At times like those, a brand can make a lot of difference.

## WHAT TO DO

So suspend belief for a moment and pretend it really is important to present a consistent face to your customers —

backed up of course by excellent performance (without which branding truly is a futile exercise in image polishing). What can you do in the next six months or a year? Here are a few items.

**Logo.** Have a visual marker that appears everywhere — a symbol that says you stand for clean water, a clean community, and a quality environment. How to create it? Community logo contests are fine, but you shouldn't leave something this important to amateurs. Have a contest if you want, but let some local design professionals pick the winner, and hire a professional to refine and polish the chosen entry. If you already have a logo, but it's tired and drab, create a new one that has some pop.

You might ask, "Who cares? What's wrong with just doing a great job and keeping a low profile?" Nothing, maybe, until it's time to convince the public to spend big money for a plant upgrade. Or until something bad happens.

**Sign.** In our PlantScapes column in this issue and in coming months, you'll see great examples of treatment plant signs that are colorful, classy and inviting, and are often surrounded by great landscaping of flowers, native grasses and shrubs. Of course, put the logo on the sign. In materials sent to us recently, we've seen some striking "before and after" pictures. It's amazing what a difference in first and lasting impressions the right sign can make.

**Giveaways.** Make notepads. Coffee cups. Caps. Pens. Print the logo on them. Hand them out (judiciously) to visitors, tour groups, attendees at public meetings. Choose items of decent quality — never put your logo on junk.

**Uniforms.** I don't mean your team members should wear car mechanic blue jumpsuits with their name above the pocket. But what's wrong with everyone wearing quality work shirts in the same color — with the logo sewn in? Besides impressing visitors, nice work attire has a strange way of helping team morale, too.

**Web site.** Don't just have a single page under the city's Web site that tells how old, what process, how much flow, and so on. Create an actual site where you can show your buildings and processes, introduce your people, describe your performance record, list your awards. Put the logo on every page.

**Brochure.** Have something to hand out to visitors, to students at class presentations, to job prospects at employment fairs. Again, think quality. Don't just slap something together in black and white. Have a professional design it. Use high-quality photographs. Hire an excellent printer. Include the logo.

## IT ALL ADDS UP

Doing all these things (and others I could name) won't make you as recognizable as General Electric. But their cumulative effect will be to help create a clear and enduring impression of what you do and why it's important. None of these items are terribly costly, especially when the costs are weighed against long-term value.

Does your treatment plant or agency have a strong brand? If so, let us hear about how you created it and how it helps you. Please drop a note to editor@tpomag.com, and I promise to respond. We'll use some of the most interesting stories on our pages. tpo

# Brand New Look

## THE WATER AND SEWER AUTHORITY IN THE U.S. CAPITAL REACHES OUT TO CUSTOMERS BY CREATING A NEW BRAND AND THE SLOGAN, "WATER IS LIFE"

By Diane Gow McDilda



LEFT PHOTO: The unveiling of the logo on the DC Water building. BELOW: The unveiling of the entrance sign. From left, District of Columbia mayor Adrian Fenty, DC Water general manager George Hawkins, and DC Water board chairman William Walker.

When the public is asked to approve water or sewer rate increases, it helps if they know where the money is going.

That was the reasoning behind the rebranding campaign in which the District of Columbia Water and Sewer Authority became DC Water. "Wastewater treatment is out of sight and out of mind," says George Hawkins, general manager of the agency. "Nobody thinks about it, and the public often doesn't recognize its importance.

"Now we have more stringent effluent requirements and a remarkably old, like Lincoln-administration old, collection system. If we don't connect with the public, fundamentally, how are we going to operate over the next 10 to 20 years?"

Ultimately, Hawkins hopes that when customers are asked for a $10 a month increase, they'll be so supportive they'll offer up $20 instead. He knows that's unrealistic, but he still aims for that kind of public support. "If it's a fundamental program, the public will find a way to support it," he says.

### INVOLVED FROM THE GET-GO

The agency announced the rebranding campaign at a press conference and asked the public for input in the form of a contest, offering a cash award of $2,500 for creating the new logo and slogan.

Hawkins admits there was some pushback from professional graphic artists who wanted more input, but the authority was determined to involve the public as a way to encourage citizens to think about what the agency does and how important it is.

There were 178 entries. Public affairs staff reviewed each one and ranked them on a score sheet. Hawkins and his staff then reviewed the top 20. "We liked parts of three of them, this part from one, that part from another," says Hawkins. "Our team did a final design based on a set of designs from the contestants, so the three winners divided up the cash award."

The tagline, "Water is Life" originated in-house — it was a signature line Hawkins used in his e-mails, and it seemed to fit with the water drop logo and DC Water's message of serving the public and protecting the environment.

The agency kept the final design under wraps until the unveiling ceremony outside the five-story operations building on June 15. There, staff members revealed the 7-foot-tall backlit, solar-powered DC Water sign mounted on the side of the building. For commuters traveling on I-295 it is hard to miss.

Mayor Adrian Fenty was on hand, posing for photos with Wendy the Waterdrop, the DC Water mascot. A presentation reminded the public that water and wastewater affect every part of their lives and that everyone is intertwined with DC Water services.

"Now we have more stringent effluent requirements and a remarkably old, like Lincoln-administration old, collection system. If we don't connect with the public, fundamentally, how are we going to operate over the next 10 to 20 years?"

**GEORGE HAWKINS**

**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@tpomag.com or call 877/953-3301.**

## COST CONSCIOUS

The rebranding campaign cost about $180,000. While that seems like a lot of money, Hawkins stresses that it's a matter of scale: the agency runs on a $400 million operating budget and a $400 million capital budget. Hawkins believes a rebranding program could easily be scaled down to fit the budget of a smaller municipality or utility.

Still, Hawkins knew the sensitivity. "We understood that it was the ratepayers' money and that we had to spend it carefully," he says. The new brand was rolled out slowly. "Things are not being changed all at once," says Hawkins. "We have more than 500 vehicles, so changes in the decals are made when the vehicles are in the shop for something else."

That includes Hawkins' car, which now displays the new logo along with his title, on both sides. "It connects me to people," he says. "They honk and wave. I do have to drive more considerately now, but the payoff is worth it."

Because the authority didn't legally change the name, existing letterhead with the old name can be used up. When new stock is ordered, it will have the new logo. The authority went one green step further: The new stationary uses soy ink and a higher recycled content.

Employee uniforms also show the new logo, but all that took was switching of patches. All in all, Hawkins looked to simplify the transition.

PHOTOS COURTESY OF DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY

Mayor Fenty with Wendy the Waterdrop.

## TO THE STREETS

Hawkins and his team didn't rely on the branding campaign to garner support for their projects: They took their presentation to the streets. "We did meetings everywhere and brought in a lot of different technical people," he says. "That way we were prepared. If someone came to the meeting and asked a question, there was someone there who could answer it."

While "everywhere" may be an exaggeration, it's not much of a stretch. From mid-April to mid-May, the group visited nearly 30 locations, from meetings with advisory neighborhood commissioners to environmental education fairs and police department youth events.

Wendy the Waterdrop mingled then and continues to, from handing out water at DC triathlons to helping keep visitors cool at a misting tent at the mall. During these public events, Hawkins made an effort to talk with the customers. "It's our responsibility to connect with the public," he says.

Besides building public support, the rebranding had another benefit: Morale improved. "Our thought about the industry is that the people who work for us are on the side of angels," says Hawkins. "The campaign is meaningful to our people because we're proud of what we do." tpo

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top performer: **AGENCY**

Aeration tanks and clarifiers at the Fox River Water Reclamation District south treatment plant in Elgin. (Photography by Rob Hart)

# Rising to the *Occasion*

KEY TEAM MEMBERS AT AN ILLINOIS DISTRICT STEP UP TO MEET BIG CHALLENGES CREATED BY A SUDDEN WAVE OF EARLY RETIREMENTS

By Trude Witham

WHEN 26 PERCENT OF FOX RIVER WATER RECLAMATION District employees took early retirement in 2006, including several key managers, there could have been serious consequences. Instead, the retirements opened the door for other employees to move up, and ultimately strengthened the organization.

The district reacted to the sudden loss of long-time, highly valued employees by promoting mainly from within and giving the new managers the training they needed to keep up the treatment plants' excellent performance.

The new team managed successfully through an extensive series of plant upgrades and performed so well that the plants received several awards from the National Association of Clean Water Agencies.

Ed Brown, chief operator of the South Plant, credits the successful transition to front-line employees willing to accept challenging new roles, and to a work culture that encourages teamwork and sharing of information.

## MAJOR EXODUS

The FRWRD is headquartered in Elgin, Ill., about 35 miles northwest of downtown Chicago. Its three wastewater treatment plants and water plant serve 180,000 residents. The district's 50-member team includes 21 operators, 13 people in maintenance, five in the lab, five in engineering, and six in administration.

The largest of the district's activated sludge treatment facilities is the 25 mgd (design) South Plant. It treats sludge from all three plants by anaerobic digestion and dewaters the biosolids for land application. That plant is also home to the district administration offices and laboratory.

The North Plant has an 8 mgd design flow, and the West Plant 5 mgd. All three plants have consistently met their discharge permits. "We have to meet pH, dissolved oxygen, ammonia, seasonal chlorine residual and coliform, but other than that, our permit specs are probably pretty typical for the size of our facilities in our area," says Brown.

In November 2005, the district Board of Trustees approved an Early Retirement Initiative (ERI), expecting perhaps three or four employees to take advantage. Within 18 months, 13 of the 50 staff members decided to retire, forcing the district to prepare for the loss of 40 percent of its core management and a large share of its institutional memory.

Those who left included the general manager, lead operator, chief chemist/lab manager, superintendent, and industrial surveillance officer, as well as several operators and maintenance staff. "When they offered the ERI, it seemed that everyone who was eligible took it," Brown recalls. "Most of them had 30 years on the job."

The district created an action plan to deal with the open positions, and the board conducted a nationwide search for an experienced general manager. The retiring general manager agreed to screen resumes and sit in on interviews.

The ERI allowed a 12-month "retirement window" in which employees could announce their intent to retire months before they actually did so. That made time for aggressive training for their replacements and smoothed the transfer of institutional knowledge.

## PROMOTING FROM WITHIN

Fortunately, the remaining employees, some of whom had been there for 20 years or more, answered the call. Except for new general manager Bob Trueblood, an external hire with 30 years of experience, all other management positions were filled from within.

These included Brown (18 years of experience), superintendent Doug Haacker (25) and assistant superintendent of operations Randy Chapman (30). Other key managers are:

- Scott Hansen, chief operator, South Plant, second shift.
- Steve Moore, assistant superintendent of maintenance.
- Rick Manner, assistant general manager.
- Jack Russell, lab manager.
- Herb Rudiger, chief operator, North Plant.
- Mike Dacka, industrial surveillance officer and pretreatment coordinator.

The district hired eight entry-level employees to fill the positions of those who moved up. "Not all the people who moved into management positions had management experience, and so there was quite a learning curve, a seat-of-the-pants, learn-as-you-go type of situation," says Brown. "But, what's amazing is that we were successful in meeting our specs during that time. There was no loss of quality, and if anything, we have seen an increase in quality."

Chapman agrees: "If we had hired people from outside the district to fill those positions, I think it would have been more difficult with more mishaps. By promoting from within, everyone stepped up to the task and improved the culture within the district. It's more of a group effort now."

The managers dealt with their employees' learning curves by offering a great deal of technical training, but they were on their own when it came to managing people. Chapman believes the district's managers have succeeded because most of them started out as operators, knew wastewater treatment, and knew their plants and personnel.

Also important: Their personnel knew them. "We came into these positions already having the respect of the people working under us," says Brown. "It takes time to build that kind of working relationship, and not having to spend the time and energy doing that gave us more opportunity to concentrate on learning the technical aspects of the positions we were promoted to. I believe that contributed to our success, along with the ability to work together when it comes to decision-making."

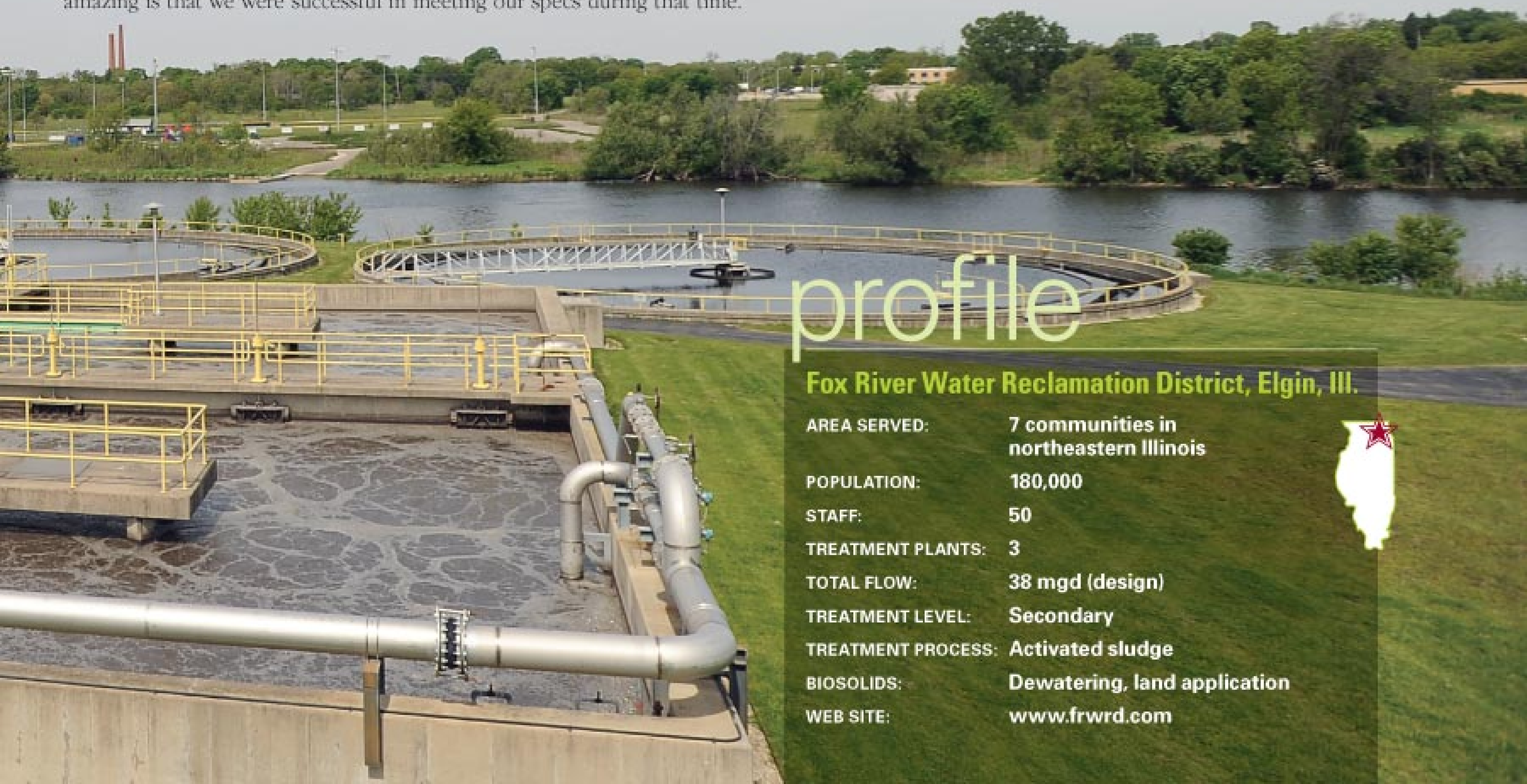
## A BETTER ENVIRONMENT

Since the reorganization in 2006, the district has made significant changes that strengthened the team. Those include:

- More personnel development and training.
- More operators and maintenance personnel involved in project design and development and in daily process control decisions.
- More participation from non-management staff in wastewater and water supply professional organizations.

"These things together contribute to a better working environment and greater job satisfaction, and hopefully that results in a smoother, more efficient operation," Brown says. The district has seen an increase in certified employees, as many operators and maintenance personnel went back to school.

"Before the ERI, there were six Class 1 wastewater employees," says Brown. "Four of those retired, and yet we now have nine. We had five Class 4 wastewater employees before ERI. One retired, and now there are eight. If you look at all the Class 1 to 4 operators, we had 16, lost six, and now have a total of 20. That's a pretty good increase."



# profile

## Fox River Water Reclamation District, Elgin, Ill.

| | |
|---|---|
| AREA SERVED: | 7 communities in northeastern Illinois |
| POPULATION: | 180,000 |
| STAFF: | 50 |
| TREATMENT PLANTS: | 3 |
| TOTAL FLOW: | 38 mgd (design) |
| TREATMENT LEVEL: | Secondary |
| TREATMENT PROCESS: | Activated sludge |
| BIOSOLIDS: | Dewatering, land application |
| WEB SITE: | www.frwrd.com |

## MUCH DECORATED

Consistent performance at the Fox River Water Reclamation District's three treatment plants has led to several awards for permit compliance in the past five years. In particular, the plants have received these Peak Performance awards from the National Association of Clean Water Agencies:

- North Plant: 2006 Silver Award, 2007-09 Gold Awards
- South Plant: 2006, 2007, 2009 Silver Awards
- West Plant: 2006-2009 Gold Awards

Phil Miller, wastewater operator, pumps sludge out of a primary clarifier.

### MEETING CHALLENGES

Since 2006, the district has gone through 13 plant upgrades. "We've had quite a few changes in the last few years, including a switch to sodium hypochlorite disinfection, upgrades to the main pumping station, and new force mains," says Brown.

Although the larger projects were outsourced, in-house teams handled some of the smaller jobs, such as replacing the pumps at three lift stations and complete skirt replacement on two 110-foot-diameter Lakeside Equipment peripheral feed clarifiers.

The switch to sodium hypochlorite in 2009 was mainly for safety reasons and to improve control. "We now have a much safer, less labor-intensive disinfection system," says Brown. "The chemicals are now computer controlled using oxidation-reduction potential (ORP). That gives us better overall control of disinfection and dechlorination." Other upgrades included:

- A sludge force main between North and South plants.
- Replacement of conveyors for belt presses and a truck loading bay at the South Plant.
- Replacement of three return sludge screw pumps with Lakeside screw pumps at the South Plant.

According to Haacker, the plants' biggest challenge came in September 2008 during heavy rains related to Hurricane Ike. "We had nine inches of rain in two days, and it was during the middle of our pump upgrade project," he says. "We had five 10 mgd portable pumps all running to bypass the station. All we had were these pumps, but luckily they came through OK."

### GOOD WORKPLACE

Despite all the changes from the ERI, there has been no turnover in the district except for one new hire who didn't work out. "It's a good place to work," says Brown, "but I think it's more that people like their jobs and look forward to coming to work every day."

> "If we had hired people from outside the district to fill those positions, I think it would have been more difficult with more mishaps. By promoting from within, everyone stepped up to the task and improved the culture within the district. It's more of a group effort now."
>
> **RANDY CHAPMAN**

It's also the management style. "We make a point of talking to all the operators between shifts and making everyone feel like part of the team," says Chapman. "Everyone shares information, and I don't need to ask them how it's going, because they tell me."

Haacker stresses that it's not just the operators who keep the plant running well. The lab, maintenance and engineering employees also deserve a great deal of credit. "Our lab people, including the manager, test everything from suspended solids to phosphorus, and inorganic materials with atomic absorption spectroscopy," he says. "Keeping this work in-house provides us with better quality control, as well as immediate feedback for process control."

Phil Miller maintains the sludge and oxygen levels in the aeration tanks.

Brown adds, "The maintenance crew is an integral part of the whole thing. They do everything from rebuilding pumps, repairing force main breaks, repairing sewers, maintaining the vehicles, doing grounds work, and checking and maintaining lift stations. The engineering crew orchestrates all the process improvements."

## ALWAYS IMPROVING

Despite a track record of compliance and awards, a healthy culture and happy employees, the managers at FRWRD are not complacent. They plan to continue their education and their participation in professional organizations.

"My goals include continuing to educate and train myself and others," says Brown. "I also plan to stay actively involved with the organizations I am a member of, and continue to do the best job that I can to prepare myself for the next advancement opportunity."

Brown, Haacker and Chapman are members of the Water Environment Federation, the Central States Water Environment Association, the Illinois Association of Water Pollution Control Operators, the Illinois Section of American Water Works Association, and the Fox Valley Operators Association, of which Brown is vice president.

"It's extremely helpful to be involved in these organizations because of the training they offer, and because it helps to share ideas with other wastewater operators as well as hear about problems others have had and how they solved them," Brown says.

Brown hopes others can benefit from knowing about the district's ERI experience. "The takeaway from this is that a few key people who were once in the background were able to step up and keep the district running without missing a beat," he says. "With this type of loss happening or about to happen nationwide, maybe some of our experiences and the obstacles we overcame will help other plants out there."

Chapman says that if other plants were to go through what his district experienced, "new managers should include everyone in the decision-making process. That can improve everyone's attitude."

Haacker recommends that experienced as well as less experienced managers keep up with their training: "If you run a small facility and half the employees retire, and you don't know anything about operations, where does that leave you?" tpo

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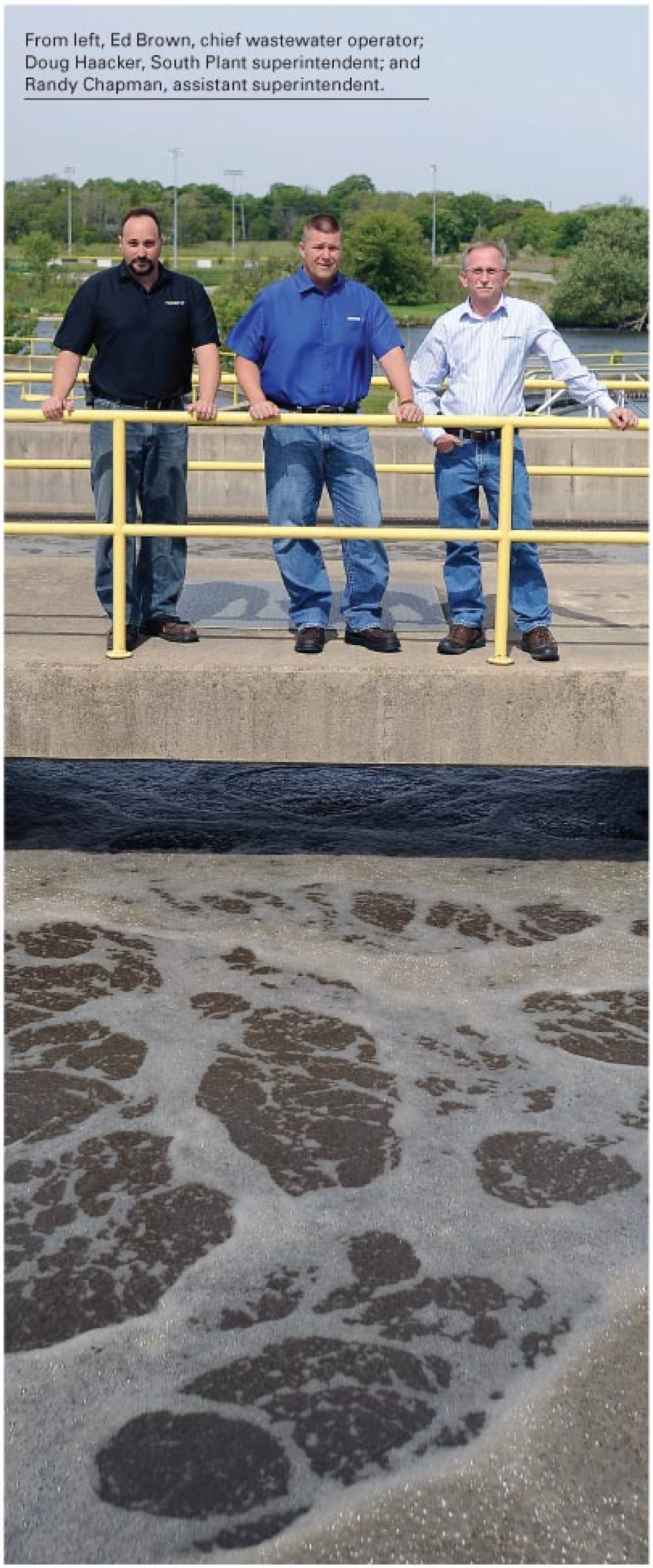
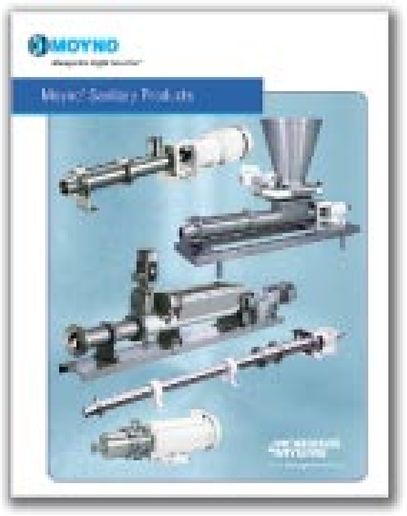


From left, Ed Brown, chief wastewater operator; Doug Haacker, South Plant superintendent; and Randy Chapman, assistant superintendent.

## industry news




### Moyno Offers Product Brochure

Moyno's latest product brochure describes technical innovations and key features of its progressing cavity sanitary line, including sanitary pumps, high-pressure pumps, the electrically driven AugMentor pump stuffer and the Chopper Hopper that combines grinding and pumping in one unit.

### Staco Releases Products Brochure

Staco Energy Products has released a 4-page, full-color brochure detailing the company's power quality products for wastewater facilities, including voltage regulation, power conditioning, power factor correction, harmonic mitigation and uninterruptible power supplies for use in water pumping stations and wastewater treatment sites. The brochure can be downloaded at www.stacoenergy.com.

### Aqua-Aerobic Purchases Swiss Company

Aqua-Aerobic Systems, Loves Park, Ill., has purchased Mecana Umelttechnik Ag of Reichenburg, Switzerland. Mecana has served the municipal, commercial and industrial sectors, specializing in biological, compact sewage treatment systems and cloth media filtration technology. Mecana will continue to operate from its facility in Switzerland.

### VOMM Partners with Drycake

VOMM Impianti e Processi SpA, Rozzano, Italy, has partnered with Drycake to market the Turbo Sludge dryer in North America. The sludge dryer needs no backmixing and adjusts final output according to the needs of the individual application.

### Jeyanayagam Joins CH2M HILL Consulting Firm

Dr. Samuel Jeyanayagam has joined CH2M HILL, a full-service consulting, design, construction and operations firm, as vice president and senior principal technologist in the company's Global Technology Group. He will provide technical leadership and direction on wastewater treatment projects nationally and internationally. Dr. Jeyanayagam's areas of expertise include biological nutrient removal, biosolids processing and ultraviolet disinfection. He received his master's and doctorate degrees from Virginia Tech.

### Caldwell Tanks Offers Asset Preservation Program

The Tank Asset Preservation (TAP) program from Caldwell Tanks includes the TAP-ONE extended warranty for new tanks. A pre-established rate will not increase over the life of the warranty and is renewed annually at the owner's discretion. Caldwell Preservation Teams are comprised of in-house professional engineers and NACE-certified coating inspectors. **tpo**

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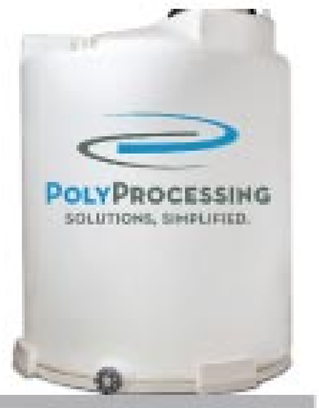
# Safety Equipment

By Benjamin Wideman

## HYPOCHLORITE STORAGE

Sodium hypochlorite storage systems from Poly Processing use carbon black, white or gray compound XLPE resin that dramatically reduces UV degradation of the chemical. To prevent the buildup of transition metals in the tank, the unit has an IMFO system that allows for full drainage of the tank. This can greatly increase the half-life of the chemical and the life of the tank.




**Sodium hypochlorite storage systems from Poly Processing**

The OR-1000 system allows four times the antioxidant strength of a normal polyethylene. It is made in a rotomolding process that creates a seamless bond between an inner surface of medium-density polyethylene and an outer surface of high-density crosslinked polyethylene. **866/590-6845; www.polyprocessing.com.**

**EcoPolyBlend spill-control pallets from Justrite Mfg.**

## SPILL CONTROL

EcoPolyBlend spill-control pallets from Justrite Mfg. are a green solution that protects against groundwater contamination. They are made of 100 percent recycled polyethylene. **847/298-9250; www.justritemfg.com.**

## SERVICE BARGE

The 8- by 12-foot Service Barge from American Pleasure Products Inc. has all-aluminum frame construction with stainless steel hardware. It has an 8- by 12-foot platform, weighs about 550 pounds, and has a capacity of 1,400 pounds. The unit has 3/4-inch 7-ply marine-grade plywood flooring, 23-inch diameter aluminum pontoons, a heavy-duty motor mount for small gasoline or electric motors, and a 1,000-pound-capacity crane. Non-slip vinyl decking provides a safe work environment and easy cleanup. The barge has a heavy-duty protective handrail with 1/4-inch rail spacers and a protective lower rail to help keep tools on board. There are safety chains at all handrail openings and lifting eyes at each corner. **989/685-2697; www.aquacycleusa.com.**

**Service Barge from American Pleasure Products**

**Dynarail handrail systems from Fibergrate Composite Structures**

## SAFETY HANDRAILS

Dynarail fiberglass reinforced plastic (FRP) handrail systems from Fibergrate Composite Structures provide safety and comfort for workers on stairways, walkways and platforms. Combining corrosion resistance, long life and a low-maintenance design, the railings do not become hot when exposed to the sun. Components are lightweight and easy to fabricate. Everything is provided to install OSHA- and IBC-compliant horizontal and inclined handrail systems with two or three rails. **800/527-4043; www.fibergrate.com.**

## EYE PROTECTION

Varsity eye protection from Gateway Safety has a V-shaped temple design and wraparound lens. Designed for indoor or outdoor use, its soft, adjustable nosepiece provides a custom fit and keeps glasses from slipping even when wet. It weighs less than 1 ounce and meets or exceeds ANSI Z87.1+ and CSA Z94.3 standards. It also blocks more than 99.9 percent of UV-A, B and C light. It is available with gray or clear temples and in lens colors including clear, gray, clear or gray anti-fog, amber, orange, vermillion. Mirror lenses are available in clear, silver, or blue. **800/822-5347; www.gatewaysafety.com.**

**Varsity eye protection from Gateway Safety**

**Water/Wastewater confined space communications kit from Con-Space Communication**

## COMMUNICATIONS KIT

The Water/Wastewater confined space communications kit from Con-Space Communication is designed to go with its user into confined spaces such as tanks, towers, bilges and tunnels. The waterproof, dust-tight unit works with all respiratory protection. **800/546-3405; www.con-space.com.**

## EMERGENCY LIGHTING

The Max-Lite Series emergency lighting unit from Chloride Systems is designed for locations where oil-, water- and dust-resistant equipment is required. The device is certified to NSF Standard 2 Splash Zone and is UL listed for use in damp and wet locations in temperatures from 0 to 40 degrees C.

Standard Intelli-Charge self-diagnostic electronics monitor all critical functions, and optional self-testing satisfies monthly periodic testing requirements in NFPA 101 and the IBC. The system includes an onboard IR receiver and is preprogrammed for use with the company's optional handheld test device, enabling remote testing to meet all applicable building code requirements. The system includes maintenance-free sealed lead-calcium or nickel-cadmium batteries. **910/259-1000; www.chloridesys.com.**

**Max-Lite Series emergency lighting unit from Chloride Systems**

## FALL PROTECTION

**Self-closing safety gates from FabEnCo**

FabEnCo self-closing safety gates, available in aluminum, carbon steel and stainless steel, are adjustable swinging gates for fall protection as required by OSHA at unprotected openings on ladders, platforms, stairs, catwalks, mezzanines and machine guarding. Gates include the A Series (double-bar gate), XL Series (extended vertical coverage), R Series (metal alternative to replace old plastic gates) and Z Series (for new construction). Gates can be ordered in galvanized steel and safety yellow powder coat.

Easy to install on most types of handrails (angle, flatbar, pipe) or to existing walls, the gates save the time and money it takes to fabricate gates. Gates can be mounted on the left or right side of handrail openings, at different levels. Once the stop bolts have been adjusted, each gate's stainless steel spring automatically closes the gate to the customizable stop point set on the gate — up to a 90-degree angle.

Gates are shipped with all necessary mounting hardware and mounting instructions. **800/962-6111; www.safetygate.com.** tpo

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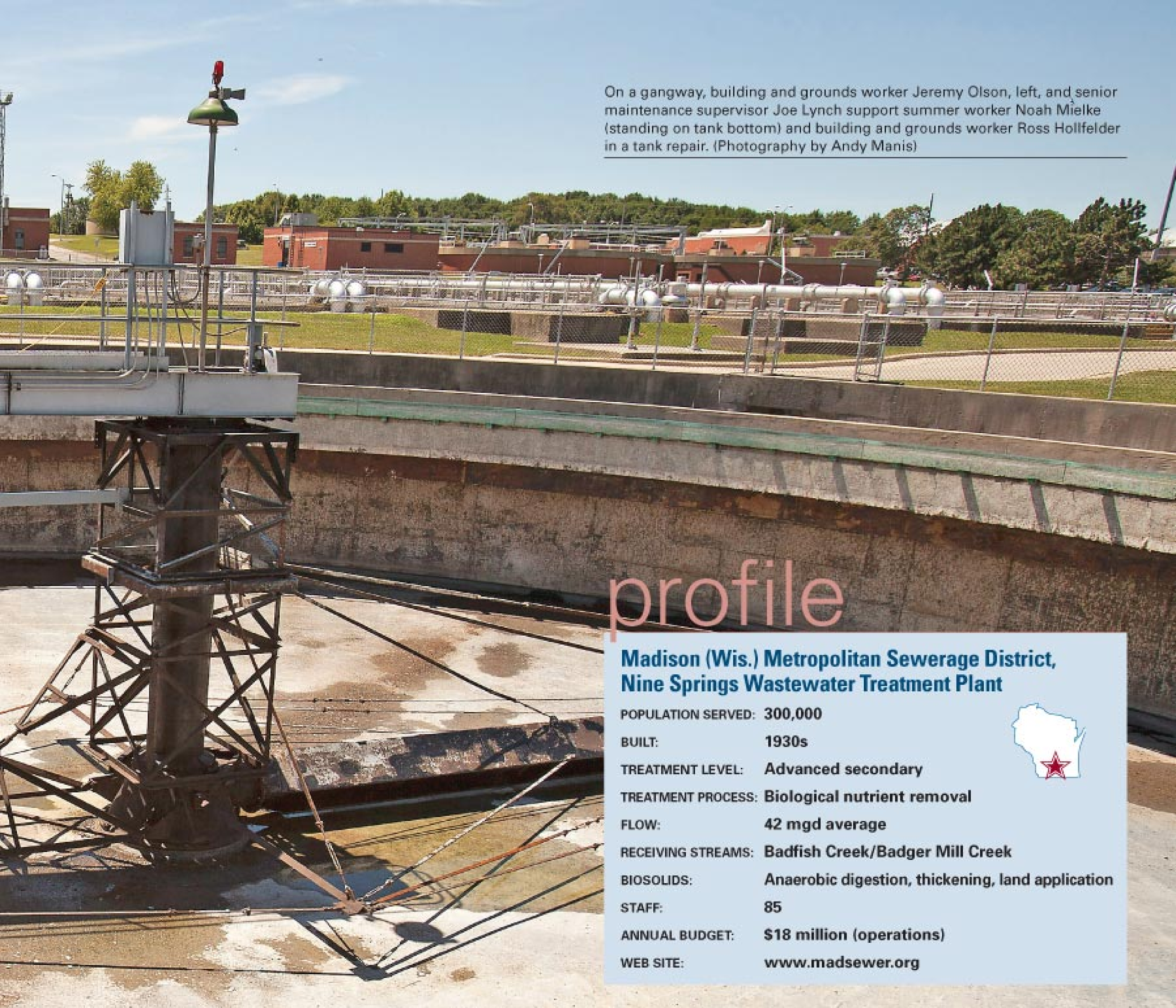
# School to *Work*

A CLOSE RELATIONSHIP WITH THE UNIVERSITY OF WISCONSIN HELPS MADISON'S WASTEWATER TREATMENT PLANT FIND SOLUTIONS TO CHALLENGING PROBLEMS

By Jim Force



On a gangway, building and grounds worker Jeremy Olson, left, and senior maintenance supervisor Joe Lynch support summer worker Noah Mielke (standing on tank bottom) and building and grounds worker Ross Hollfelder in a tank repair. (Photography by Andy Manis)

## profile

### Madison (Wis.) Metropolitan Sewerage District, Nine Springs Wastewater Treatment Plant



| | |
|---|---|
| POPULATION SERVED: | 300,000 |
| BUILT: | 1930s |
| TREATMENT LEVEL: | Advanced secondary |
| TREATMENT PROCESS: | Biological nutrient removal |
| FLOW: | 42 mgd average |
| RECEIVING STREAMS: | Badfish Creek/Badger Mill Creek |
| BIOSOLIDS: | Anaerobic digestion, thickening, land application |
| STAFF: | 85 |
| ANNUAL BUDGET: | $18 million (operations) |
| WEB SITE: | www.madsewer.org |

AT A TREATMENT PLANT THAT HAS BEEN PRACTICING biological nutrient removal (BNR) for more than 20 years and enjoys a unique relationship with the engineering and soils departments at a major university, siloxanes and struvite probably don't have a chance.

A hub of water management research and innovations, the Nine Springs Wastewater Treatment plant in Madison, Wis., is well prepared to overcome the challenges of these troublesome residuals, as well as future issues.

"We enjoy a great relationship with the staff and students in the University of Wisconsin's civil and environmental engineering programs, and more recently, the university's soils department," says Paul Nehm, director of operations and maintenance. "We sit down regularly with the faculty and plan graduate-level research projects. We help the students conduct their studies, and the students in turn help us find solutions to problems."

Perhaps the most significant achievement of this applied research approach was work that showed that single-stage nitrification could perform well in Madison's cold climate. The discovery saved the plant's owner, the Madison Metropolitan Sewerage District, at least $2 million versus the cost of a two-stage nitrification system that had been proposed.

That was more than 25 years ago. Today, the focus is on removing siloxanes from the plant's digester gas so that the chemicals, found in shampoos and other personal care products, don't deposit in the engines that burn the gas.

Another issue is preventing struvite (ammonium magnesium phosphate) from scaling and clogging pipes and pumps. The plant's operations and maintenance staffs, and a number of graduate students, have been working on the problems. Solutions are at hand.

### 80 YEARS OF SERVICE

The Nine Springs plant lies on the southeast side of Madison, Wisconsin's capital. A regional facility since the 1930s, it treats about 42 mgd from a district that encompasses a number of cities, villages and townships. About two-thirds of the flow emanates from Madison. The plant also accepts septage from non-sewered areas in the district.

Nathaniel Heiden, relief operator, inspects equipment used to test dynamic wet pressure on the aeration diffusers.

**Madison Metropolitan Sewerage District**
**Nine Springs Wastewater Treatment Plant**
**PERMIT AND PERFORMANCE (2009 YEARLY AVERAGES)**

| | INFLUENT | EFFLUENT | PERMIT |
|---|---|---|---|
| BOD | 228 mg/l | 3.9 mg/l | 7 mg/l |
| TSS | 218 mg/l | 4.0 mg/l | 10 mg/l |
| Nitrogen | 37.5 mg/l TKN | 0.09 mg/l ammonia | 1.0 mg/l |
| Phosphorus | 5.8 mg/l | 0.29 mg/l | 1.5 mg/l |


Madison Metro has long provided high-quality biosolids to area farmers. Shown are, from left, Brad Walker, building and grounds supervisor; Nathaniel Heiden, relief operator; Rick Neath, plant operator; and John Nelson, relief operator.

The flow enters the plant through a system with five interceptor sewers and 17 pumping stations and passes through a trio of rotating band screens (Brackett-Green, now Ovivo). Screen openings are 6 mm, and the screens operate with variable-speed drives that control influent wet well levels and maintain a minimum level above the influent flowmeters.

Three vortex-type grit chambers remove sand and grit, and the screenings and grit are deposited in containers for landfilling. Nineteen rectangular primary settling tanks (Siemens clarifier with Rexnord Industries' non-metallic chain) remove floatable and settleable solids, which are pumped to the solids handling portion of the plant.

Secondary treatment consists of what Nehm and his staff call a "UCT variation" system. The activated sludge process is configured into anaerobic, anoxic, and aerobic zones, equipped with fine-bubble diffusers (ITT Water & Wastewater – Sanitaire). The process achieves phosphorus and ammonia removal in a single tank. For all of 2009, effluent averages were 0.09 mg/l for ammonia and 0.29 mg/l for phosphorus.

Treated water then settles in a combination of center feed/peripheral draw and peripheral feed/peripheral draw Envirex secondary clarifiers (Siemens Water Technologies). The overflow passes to a UV disinfection system which operates between April 15 and Oct. 15. Relief operator Dianne Krewald cleans all UV lamp banks with phosphoric acid solution during winter and prepares the units for the next disinfection season.

Plant effluent is discharged to two watersheds. A 5-mile pipe carries the greater portion to Badfish Creek, which empties into the Yahara River several miles south of the plant. A lesser flow is directed by pipe to Badger Mill Creek in the Sugar River watershed.

## USEFUL BIOSOLIDS

Biosolids are no afterthought here. In fact, a complex treatment train captures digester gas, turns it into fuel, and provides power and hot water for the plant. Gravity thickeners bring the primary sludge to about 4.9 percent solids, and dissolved air flotation units thicken the waste activated sludge to about 4.5 percent solids ahead of the anaerobic digesters.

The digesters operate as a single-stage mesophilic system, reaching temperatures of about 100 degrees F. They are equipped with Ovivo draft tube mixers and Infilco Degremont cannon gas mixers. Augmented with a liquid emulsion polymer, Ashbrook gravity belts thicken the digested biosolids to an average concentration of 5.4 percent solids. Using district-owned trailers, private contractors and district staff haul the material wet to about 60 area farms and apply it with district-owned Ag-Chem injectors (AGCO). The product is known commercially as Metrogro.

Gas produced in digestion is about 60 percent methane. Some gas feeds boilers for plant heating and runs an 800 hp Dresser Waukesha engine powering one of the aeration tank blowers. The rest fuels two 450 kW Dresser Waukesha engine-generators to produce electricity. In the most recent full year of operation, the total system produced a daily average of 10,440 kWh, and the engine blower saved the purchase of about 8,900 kWh per day.

> "The district has been extremely fortunate to have a great university in its backyard. The multiple projects completed cooperatively have resulted in some great decisions, development of talented engineers, and the advancement of the profession."
>
> **JIM NEMKE**

Operations supervisor Jeff Woerpel (left) and operations engineer Steve Reusser.

There's more: Heat from the engines is recovered to heat the digesters and most of the plant buildings. "I think we're getting the most efficient use of the gas," says operations supervisor Jeff Woerpel.

## SMOOTH ORGANIZATION

The 85 district employees work daily to ensure that wastewater is transported safely to the treatment plant, that the treatment plant meets the discharge limits required by the Wisconsin Department of Natural Resources, and that the biosolids are safely recycled. "This requires the commitment of a talented staff at all levels of the organization," says Nehm.

The plant's engineering department works with various consulting firms, acting as project managers for collection and treatment systems. The special projects group includes a state-certified laboratory that analyzes samples from the plant and from surrounding communities in the district.

Two employees staff the purchasing department, and the collections team includes a five-person crew responsible for the sewer interceptors. The district maintains a squad of electricians, maintenance mechanics, and building and grounds personnel. All electricians and mechanics receive training through an apprentice program that leads to journeyman status.

Plant operations are the responsibility of eight operators, half working 12-hour shifts, covering the plant 24/7. The other four operators work 8-hour shifts and fill in for vacationing 12-hour operators. Five operators are certified Grade 4, the state's highest classification.

Plant operator Rick Neath, left, and mechanic Dick Hockett with one of the Dresser Waukesha engines in the treatment plant's biogas-to-energy system.

## SOLVING PROBLEMS

The Nine Springs plant has had its share of challenges and, using the resources of its professional staff and the support from the university, it has compiled an impressive record of practical solutions.

In the past year, the plant staff has rebuilt a number of pumps and pump stations and revamped headworks, thickener and sludge circulation pumps. The electrical staff performed preventive maintenance under a computerized maintenance management system, calibrated electrical and instrumentation equipment, did thermographic testing of switches and motors, repaired and tested portable gas detectors, and inspected and cleaned all electrical components.

But the projects to control siloxanes and prevent struvite buildup have taken most of the attention in recent months. Siloxanes are on Woerpel's front burner because they can end up as harmful deposits in the plant's digester gas handling system.

"We had a catastrophic failure in one of the engines in 2006," he recalls. "The operator heard a tremendous noise, and the machine simply quit. We discovered a chunk out of the engine crankshaft, and the pistons were full of siloxane deposits — not a good thing. We've seen a tenfold increase in siloxanes in recent years." Moisture in the digester gas contributed to the problem.

To address those issues, the staff worked with Applied Filter Technology, a company in Snohomish, Wash., that had developed a solution in use at a number of landfills and at some treatment plants. The company provided a three-stage gas cleaning system. In the first stage, a large vessel containing wood chips removes sulfides. The final two stages use segmented activated graphite, a carbon based media, to remove the siloxanes so they won't precipitate as a silicate and foul the engines.

A mechanic checks the temperature of a repaired bearing using a Raytek handheld thermometer.

Since the treatment equipment is located outside on a skid, senior maintenance supervisor Joe Lynch, and others devised a shelter to shield workers and the machinery from cold winds. Applied Filter provided basic training in the technology, but the operators essentially learned along the way.

One lesson involved media cleaning. "We cleaned the media in the sulfide removal tank and the first siloxane removal tank after a year and a half," Woerpel says. "The sulfide removal media was really hard stuff. We had to call in the sewer department and use their Vactor unit to break it up and vacuum it out."

## FIGHTING FOAM

A significant issue facing the Nine Springs Wastewater Treatment Plant staff is anaerobic digester foaming, a serious winter problem for the past 10 years. The foam has the potential to damage the digester gas handling equipment and shut down the plant's energy recovery systems.

A 2009 study under the direction of professor Sharon Long of the University of Wisconsin College of Agriculture and Life Sciences developed various test methods for measuring foaming potential in the digesters and the feed sludge, and tests were created for identifying filamentous bacteria normally associated with foaming.

This work is ongoing. Plant personnel and the researchers are taking part in activities sponsored by the Central States Water Environment Association aimed at learning what operators in Wisconsin, Illinois, and Minnesota are doing to control digester foaming.

Dick Hockett, left, and Rick Neath discuss the plant's biogas treatment system.

The effort has been worth it. The siloxane levels are back to normal, and the plant has seen no further engine damage. "It's been a bit labor intensive," says Woerpel, "but we've been able to manage it."

### STRUVITE STRUGGLES

Even as the district wins the battle with siloxanes, struggles with struvite continue. Steve Reusser, operations engineer, shows a plastic bag full of pieces of struvite, looking like chunks of the White Cliffs of Dover. "This is uncontrolled struvite removal," he says. Then, showing a clear vial full of small white beads, he adds, "This is controlled struvite removal."

A sample of struvite (magnesium ammonium hydroxide) removed from piping in the treatment plant.

The beads are the product of a new process developed by Ostara Nutrient Recovery Technologies Inc. of Vancouver, B.C. It consists of an upflow column that forms the struvite beads, which can then be withdrawn from the process and marketed as a fertilizer. The Nine Springs staff plans to install the technology within the next two years.

"Our water is hard here, and we have a high level of magnesium in the wastewater," says Reusser. "Our digesters produce a fair amount of ammonia, and ever since we installed our BNR process, a lot of phosphorus is released in the digesters." As a result, struvite forms in the piping coming out of the digesters.

To make more phosphorus available for a process such as Ostara, the district worked with professors and students at the university to research ways to optimize phosphorus release from the waste activated sludge before digestion. This research has been going on for more than 10 years. Plant research engineer Alan Grooms has been further refining the process so it can be included in the construction of updated digestion facilities.

### INNOVATIVE SPIRIT

After more than 80 years of treating wastewater in the Madison area, the Nine Springs facility remains on the leading edge of process improvements and creative solutions. It's a spirit of innovation embodied in the plant staff and in the professors and students who do research there. They feed on each other.

Last summer, graduate student Amanda Boyce was dismantling her successful experiment to remove excess phosphorus at the organic acid digester phase and recover it as calcium phosphate, which could be used for fertilizer. "It could be beneficial because it can greatly reduce the amount of phosphorus in biosolids, preventing phosphorus buildup in soil and the pollution of local waterways," she says.

Boyce, who recently completed her master's degree and has taken a job with the DNR, says the Nine Springs staff and facilities strongly supported her research. "They've done everything from analyzing samples to collecting waste samples for me," she says. "They also allowed me to use several pieces of equipment, and since my project required daily attention, they gave me access to the plant on weekends and even holidays."

Retired chief engineer and director Jim Nemke sums up the relationship: "The district has been extremely fortunate to have a great university in its backyard. The multiple projects completed cooperatively have resulted in some great decisions, development of talented engineers, and the advancement of the profession.

"Why wouldn't anyone with the opportunity and resources get involved with applied research at the local level?" **tpo**

## more info:

**AGCO/Ag-Chem**
770/813-9200
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**Applied Filter Technology**
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www.appliedfilter.com

**Ashbrook Simon-Hartley**
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www.as-h.com

**Dresser Waukesha**
262/547-3311
www.waukeshaengine.com

**Infilco Degremont Inc.**
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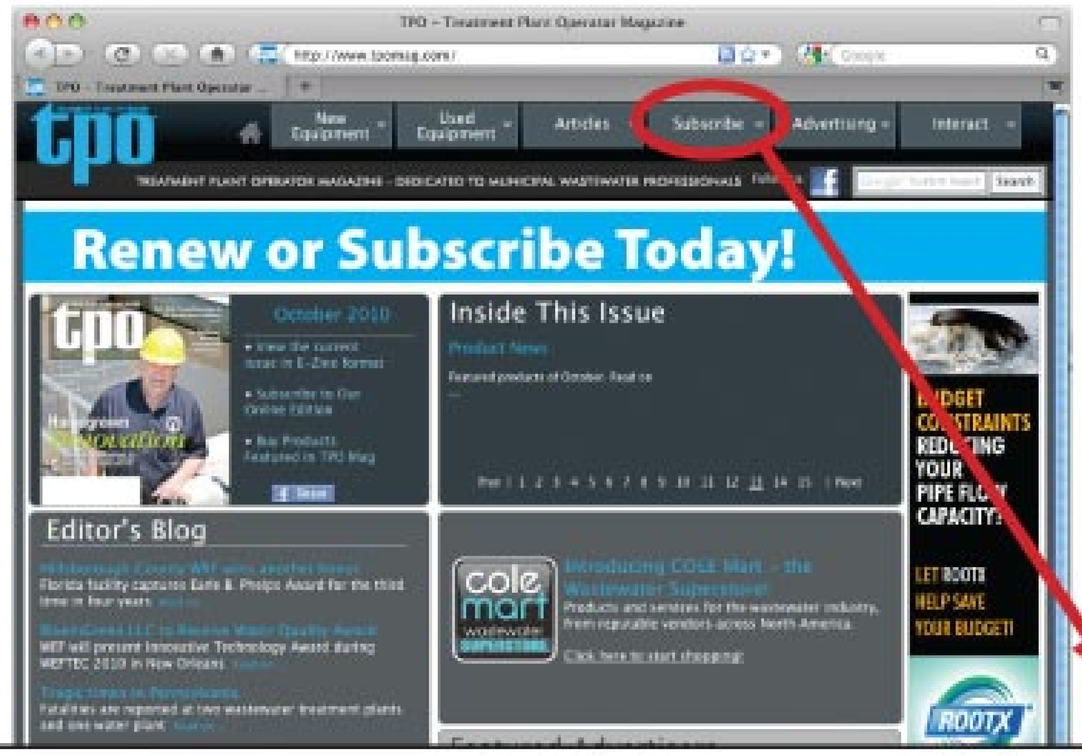
# 2011 wall-sized calendar

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# Keeping the Neighbors Happy

## OPERATORS HAVE A WIDE RANGE OF CHOICES IN TECHNOLOGIES FOR REDUCING ODOR EMISSIONS AND KEEPING GOOD COMMUNITY RELATIONS

By Rakesh Govind, Ph.D.

*There once were two cats from Kilkenny*
*Each thought there was one cat too many.*
*So they fought and they fit*
*And they scratched and they bit*
*And instead of two cats, there ain't any!*

Wastewater treatment plants and their neighbors sometimes can behave like the two cats from Kilkenny, fighting about odors and their impact on home values.

Odors are often elusive and sometimes unbearable. They can defy scientific documentation but continue to persist, like ghosts often seen but not heard. As neighbors continue to encroach on treatment facilities, odor management is increasingly important.

Dust can be an important component of odor, since it adsorbs odors and can be transported long distances. Fortunately, treatment operators have a variety of options for keeping odors under control and maintaining good relations with the community.

### MULTIPLE SOURCES

Odors are generated at several locations in wastewater treatment plants:

- Influent pump stations (typical odorants are hydrogen sulfide, reduced sulfur compounds, ammonia).
- Headworks (screening and degritting).
- Primary sedimentation basins.

For any facility contemplating odor control, an overall analysis up front can help in developing a comprehensive odor management plan.

- Aeration basins (low hydrogen sulfide, volatile organics).
- Sludge storage tanks (hydrogen sulfide, reduced sulfur compounds, ammonia, amines, organic acids).
- Dewatering, drying, loading (polymer odors, organics, ammonia).
- Digesters (hydrogen sulfide, reduced sulfur compounds, ammonia, amines, organic acids).

The concentration of odorous contaminants depends on the rate and kind of ventilation used for the enclosed systems. For example, covered buildings can operate under negative air pressure and all odorous gases can be vented through an odor treatment system.

Odor evaluation methods can be classified in three broad categories. Analytical methods include gas chromatography, sensors for specific chemicals, colorimetric detector tubes (low cost), and electronic noses with proprietary sensors. Olfactory methods include field olfactometry using a standard odor intensity referencing scale (OIRS), dilution-to-threshold dilution factors, and the olfactory threshold of an individual, such as an odor inspector. Community odor surveys can also be used to gauge the degree and geographic extent of odors.

The general philosophy for controlling or treating odor emissions is to try simple methods first before implementing complex treatment strategies. This lowers the cost of an odor-management plan. Here is a look at the benefits and potential drawbacks of several basic methods for regulating odors and achieving the desired goal at the fence line.

### AMBIENT AIR DILUTION

For contaminants not subject to regulatory requirements, such as VOC or HAPs, facilities can improve dispersion of odorous gases by increasing stack heights and optimizing the stack diameter to achieve an exit velocity of 3,000 feet per minute.

### SOURCE CONTROL

Source control involves covering the source to prevent the emission, or chemically treating the liquid-phase in the collection system to remove the odor-causing compounds and reduce sulfide corrosion.

Physical covers have limitations in that they concentrate contaminants inside the enclosed headspace increasing sulfide concentration and thereby accelerating corrosion inside the vessel. That involves capital expense for repair and makes access more difficult, as it may require confined-space entry.

Chemical treatment, if applied upstream in the collection system, can provide odor control and corrosion prevention at downstream points, such as manholes, air relief valves and re-pump stations. Treatments include addition of iron salts, nitrate solution, oxidizing agents like hydrogen peroxide, and chemicals that disrupt the sulfate-to-sulfide bioconversion process (such as the NanoCleanse enzyme solution or anthraquinone).

Chemical oxidants such as chlorine, sodium hypochlorite, potassium permanganate, ozone, hydrogen peroxide and ferric salts require on-site storage and handling of chemicals, raising safety, exposure and liability issues. Chemicals also require metering systems and proper mixing. Finally, chemicals can produce byproducts, such as precipitates.

Another option is air oxidation using venturis, blowers or compressors. These methods increase operating costs, limit gas-transfer rates and cause odorous compounds to be stripped out and released to the ambient air. Pure oxygen can be used, although it is five times more expensive than air, requires on-site storage and causes precipitation of iron oxide. Oxidizing compounds such as hydrogen peroxide are classified as hazardous and are consumed in large quantities since they oxidize everything in the wastewater — BOD, odorous compounds, and other constituents in the wastewater.

Use of chlorine or hypochlorite causes sulfides to oxidize to sulfate. The ratio of chlorine to sulfide is 8.9 under low pH and 2.2 at high pH. In field applications, the ratio used is 5 to 15, since chlorine also indiscriminately oxidizes other compounds. The major issue with chlorine and hypochlorite is the formation of halocarbons from the organics in the wastewater, and the release of these carcinogenic compounds into the ambient air.

Iron salts are specific to sulfides and do not react with other odorous compounds. Ferric salts, such as ferric chloride, react with sulfides to form sulfur while being reduced to ferrous iron. The ferrous iron reacts with dissolved sulfide to form ferrous sulfide, a light black precipitate. Ferrous sulfide also oxidizes to ferric sulfate in the aeration basin, wherein it can remove phosphorus. The major issue with iron salts is their hazardous nature, requiring double-walled tanks and piping.

Nitrate biochemically oxidizes the sulfide to sulfate in the bulk flow and in the surface layers of slime. It is also consumed biologically, since it serves as an alternate electron acceptor. Under anaerobic/facultative conditions, fairly high concentrations of nitrate and good mixing are needed to reduce sulfide concentrations in the water. Also, the sulfate formed can again reduce to sulfide under the proper conditions.

Enzyme solutions, such as NanoCleanse biochemically prevent formation of sulfides. This can be a cost-effective strategy to reduce the formation of hydrogen sulfide in anaerobic digesters.

## POINT-OF-DISCHARGE CONTROL

Technologies used for point-of-discharge odor control are activated carbon adsorption, chemical sorbents, chemical scrubbers and biofiltration.

Activated carbon adsorption is simple and can be used to adsorb a wide variety of odorous compounds. While economical at low inlet contaminant concentrations, it is not effective for ammonia and other nitrogen-based compounds. Water-regenerable carbons can be reused only a couple of times, since their capacity decreases with each cycle. They use large amounts of water, and the metal oxides chemically convert mercaptans in the gas stream to disulfides, which sometimes makes the exhaust gas smell worse.

Chemical sorbents react with hydrogen sulfide and mercaptans to form solid products. Sorbents can use organic substrates such as wood chips or an inorganic support. Iron oxide sorbents react with hydrogen sulfide to form sulfides, which are oxidized by the air in the exhaust gas to form sulfur, and the oxide is regenerated. The sulfur deposited eventually clogs the system and requires change of the sorbent.

Recently, a new class of highly porous sorbent foam products have been developed that can be used for biogas and for odorous gases. The main advantage of these sorbents is that they do not react with carbon dioxide, an issue with chemical scrubbers using sodium hydroxide. Other sorbents used include potassium permanganate dispersed on porous supports to oxidize the odorous compounds.

Chemical scrubbers use a solution of sodium hydroxide and sodium hypochlorite to solubilize and oxidize the hydrogen sulfide and reduce sulfur compounds. In multi-stage systems, the consumption of sodium hypochlorite is reduced by first scrubbing with sodium hydroxide to solubilize the hydrogen sulfide, and then reacting with hypochlorite in the final stage.

Potential issues with chemical scrubbers are the cost of chemicals, on-site storage of hydroxide and hypochlorite, corrosion of liquid-handling systems, and release of chlorine gas, which is also odorous and can react with organics in the water (transferred from the gas phase) to form carcinogenic halocarbons.

Biofiltration uses either naturally bioactive media, such as compost, soil, or synthetic media, such as randomly packed synthetic material or monolithic media. Compost and soil media systems have a large footprint, eventually require media replacement, and can handle low inlet hydrogen sulfide concentrations.

Synthetic media systems are more robust, can handle higher inlet contaminant concentrations, have a smaller footprint, and offer higher treatment capacity. The most common media is polyurethane foam, either as randomly packed small cubes or as a monolith, formed by wrapping foam sheets into a cylinder inserted in the vessel as a one-piece cartridge. Biofilters biologically convert hydrogen sulfide to sulfate in the water, resulting in low pH within the media. A potential limitation of foam media is plugging due to biomass growth, resulting in higher gas-phase pressure drop over time.

PHOTO COURTESY OF PRD TECH INC.

Odor control technologies include biofiltration systems that automatically regulate biomass growth on the media to prevent media clogging.

Biofilters treating a mixture of organic and inorganic odors need to address biomass growth and media plugging. One such system uses a different synthetic media that can be periodically washed down while the system is still operating to prevent biomass accumulation. The water wash is operated automatically by the gas-phase pressure drop across the biomedia beds.

## MORE ON THE HORIZON

Odor treatment is still an emerging area, and operators frequently try different technologies depending on the circumstances. For any facility contemplating odor control, an overall analysis up front can help in developing a comprehensive odor management plan. The choice of odor treatment technology is not a matter of one system over another but of developing a synergism of various methods to create an overall treatment system that is cost-effective and manageable.


ABOUT THE AUTHOR

*Rakesh Govind, Ph.D., is a professor of Chemical & Materials Engineering at the University of Cincinnati and president of PRD Tech Inc., a provider of odor control and other clean environment technologies based in Cincinnati, Ohio. He can be reached at rgovind837@aol.com.* tpo

# Every Drop Counts

## RENEWABLE ENERGY PROJECTS INVOLVING DIGESTER METHANE AND CONCENTRATED SOLAR POWER HELP A NEVADA REGIONAL AUTHORITY SAVE MONEY AND CONSERVE WATER

By Doug Day

Water is a common topic of conversation when you live in the middle of the Mojave Desert. With less than 10 inches of precipitation a year, the fast-growing area of Las Vegas, Nev., places a premium on water conservation and reclamation.

Serving a population that has doubled since 1990, the Las Vegas Water Pollution Control Facility treats 65 mgd using trickling filters, activated sludge, and biological nutrient removal. The treated water is sent back to Lake Mead — the region's source of drinking water — to be used again.

To make the best use of available energy resources the Las Vegas treatment plant, part of the Southern Nevada Water Authority, uses digester methane as a power source for process blowers. SNWA has also made a major commitment to solar energy that includes a new concentrated solar installation. Today, 12 percent of SNWA's power comes from renewable energy. Its goal is 25 percent by 2025.

### REGIONAL APPROACH

SNWA, formed in 1991, delivers 377 mgd for people in the Las Vegas Valley, Laughlin and Boulder City along with the 40 million visitors to the area every year.

Two-thirds of the district's annual water allocation is returned to Lake Mead from wastewater treatment plants in Las Vegas, Henderson, and the Clark County Reclamation District. SNWA is limited to 300,000 acre-feet a year from Lake Mead, but gets credits for putting treated water back into the reservoir.

"For every gallon we clean, treat and put back into Lake Mead, we are able to take another gallon out."

**JOHN BETTENCOURT**

"For every gallon we clean, treat and put back into Lake Mead, we are able to take another gallon out," says John Bettencourt, water pollution control facility engineering project manager. To reduce the demand on Lake Mead, the region's water reclamation plants recycle wastewater for irrigation and for electric power plant cooling.

### MAJOR POWER DRAW

Lake Mead, a 9.3-trillion-gallon reservoir behind the Hoover Dam on the Colorado River, provides nearly all of the water for 22 million people in Arizona, California and Nevada, about 80 percent of it for farm and urban irrigation.

Despite all the bright lights of the Vegas strip, pumping and treating water is the single largest power user in the region. The SNWA estimates pumping and treatment for drinking water consumed 853 million kWh in 2008. Wastewater agencies in the

PHOTOS COURTESY OF THE LAS VEGAS WATER POLLUTION CONTROL FACILITY

Staff members at the Las Vegas Water Pollution Control Facility have named their Dresser Waukesha engines Wilma and Betty. Each saves the plant $1,000 a day by using digester gas to power blowers.

**What's Your Story?**

***TPO* welcomes news** about environmental improvements at your facility for future articles in the Greening the Plant column. Send your ideas to editor@tpomag.com or call 877/953-3301.

The Las Vegas Water Pollution Control Facility treats 65 mgd of wastewater for people in Southern Nevada. Treated water is discharged to the Las Vegas Wash (left) and flows to Lake Mead. Some treated water irrigates two neighboring golf courses.

region's Clean Water Coalition report that treating wastewater uses 119.2 million kWh per year.

The Las Vegas wastewater plant is undertaking several projects to increase use of digester gas, according to Bettencourt. At present, two 900 hp Dresser Waukesha engines powered by digester gas drive process blowers in the nitrification and biological nutrient removal sections of the plant. "Our studies show that the engines save us $1,000 dollars a day per engine over using electric-driven blowers," says Bettencourt.

The engines, installed about 15 years ago, are available about 60 percent of the time, but a new gas scrubbing project will help remove even more impurities from the gas, reducing maintenance needs and increasing availability to about 90 percent. A pilot program to add FOG (fats, oils and grease) to the digesters will also start soon. "We hope FOG will increase our gas production without giving us too many headaches," says Bettencourt.

Meanwhile, the plant has undertaken a gas utilization study to analyze the best use for the plant's methane. That may lead to installation of microturbines or fuel cells. The plant has also issued a design-build contract to Martin-Harris Construction for a $20 million, 20-acre, 3 MW solar energy project. The feasibility study says the project will pay for itself in 20 to 30 years, depending upon how fast other energy costs increase.

## CONCENTRATED SOLAR

SNWA has undertaken many renewable energy projects to save money and conserve water. In an area where watering lawns is illegal in the afternoon for five months of the year, everyone is assigned to a "watering group." People can get rebates for replacing water-intensive grass with desert landscaping. These and other conservation efforts have saved 7 billion gallons a year since 1999.

SNWA has four solar installations, according to Gary Wood, renewable energy program manager. The newest is a concentrated photovoltaic system from Amonix Inc. at the River Mountains Water Treatment Facility in Henderson. It began operation in June 2009.

Conventional photovoltaic cells capture the sun's energy and convert it directly to electricity. Concentrated solar energy multiplies the sun's energy. Each of the six 40- by 55-foot solar panels has Fresnel lenses, like those used in lighthouses, to magnify the sun's energy 500 times. The lenses concentrate the sunlight onto one-square-centimeter multijunction solar cells made of three photovoltaic materials that capture a broader spectrum of wavelengths and produce more energy than a standard solar cell.

A dual-axis tracking system follows the sun to maximize production. In single-axis tracking systems, panels follow the sun from east to west. Dual-axis systems also adjust to the elevation of the sun through the seasons.

"On our fixed solar systems, we're seeing capacity factors in the neighborhood of 20 to 22 percent," says Wood. "Our single-axis trackers are about 25 percent, and this dual-axis system has a capacity factor of about 28 percent."


The nitrification aeration basin at the Las Vegas treatment facility.

## MORE TO COME

The system produces about 600,000 kWh per year. That's less than 1 percent of the electrical load at River Mountains, but it serves a valuable research and development function. "We're looking to add to our renewable portfolio, and we want to use technology we're comfortable with," says Wood.

SNWA also has three hydroturbines in water pipelines that provide 2 MW of capacity, and another 0.3 MW turbine is being added to the system. They replace sleeve valves that would normally regulate flow. "We're recovering energy that otherwise would be lost," says Wood.

SNWA has just begun an energy-efficiency retrofit performance contract with Ameresco Inc., and signed a power purchase agreement with a company that will convert waste oils into biodiesel to fuel 3 MW generating capacity.

Another project under consideration would use waste sludge to fuel 4 MW of capacity beginning in 2013. "We've secured a lease in northern Nevada for a potential geothermal power plant, and we are in discussions about some wind power," says Wood.

It's not a complete solution, but it will help keep clean water running to homes, farms, and businesses in the Mojave Desert. tpo

## more info:

**Ameresco Inc.**
866/263-7372
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"I love protecting the waters. I like to fish. We have a dock right off our final clarifiers where recreational boats come to pump off waste. We can go down there early in the morning and after work and catch striped bass and bluefish.

"I've been here 27 years, and I've seen the river clean up. We see harbor seals in the winter. For years we never used to see them, and now we get them every winter."

Kevin Cini
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CHIEF PLANT OPERATOR
City of Groton (Conn.)
Wastewater Treatment Facility

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# EYE ON THE LITTLE THINGS

## DARRIN BOYER'S LOVE FOR THE MICROSCOPY OF WASTEWATER TREATMENT HELPS TRANSLATE TO EXCEPTIONAL TREATMENT PERFORMANCE FOR THE CITY OF PLANO, ILL.

By Jim Force

WHEN DARRIN BOYER LOOKS INTO THE MICROSCOPE, HE LIKES WHAT he sees. "I'm fascinated by the different protozoa, the population densities, the most prominent filamentous," he says. "You can really tell the health of the plant. I take a look every other day for about an hour or so; not because I need to, but because it's really interesting."

Boyer, who's been in the clean water profession for 31 of his 50 years, is superintendent of the Plano, Ill., Water Reclamation Facility, a 2.4 mgd biological nutrient removal plant about 45 miles southwest of downtown Chicago. Started up in 2006, the plant's designer, Walter E. Deuchler Associates of Aurora, Ill., won the American Council of Engineering Companies of Illinois Honor Award for plant improvement projects.

And Boyer, who is as modest as he is recognized by his profession, recently won the William D. Hatfield Award for excellence in wastewater treatment from the Illinois Water Environment Association.

"He's one of the best operators I've ever worked with," says Mark Halm, project manager with Deuchler Associates. "This was the first biological phosphorus removal plant in our state, and Darrin was very much involved in equipment selection and plant layout. He has a good overall knowledge of nutrient removal. This plant design was done collaboratively."

Darrin Boyer. (Photography by John Bonk)

### GROWTH SPURT

Plano lies in a rapidly growing suburban area: Its population doubled to more than 10,000 between 2000 and 2009. Developers of subdivisions in the city paid for much of the $14 million cost of the plant upgrade.

The improvements included new headworks and blower buildings, extensive upgrades to the biological process, a new secondary control building housing mixed liquor distribution to the final clarifiers, water reuse pumps, plant drainage/scum pumps, the internal return pumps, and UV disinfection. A package treatment unit was converted to an aerobic digester, and the new design incorporated a centrifuge for biosolids dewatering.

The old activated sludge plant had very little instrumentation for process control and therefore very little data collection, historical trending and monitoring capabilities. Working with its electrical engineering subcontractor (Intelligent Design and Construction Solutions) and system integrator (Complete Integration & Services), the Deuchler design firm and the city chose a PlantPAx plantwide automation system from Rockwell Automation. The system features intelligent motor control and networking for better system diagnostics and process control, data collection, and remote monitoring.

Today, about 850,000 gpd of raw wastewater enters the facility through a pair of automatic 6 mm Parkson bar screens and an aerated grit chamber. The layout is equipped with a flow equalization tank and a fermentation process for volatile fatty acids.

After preliminary treatment, the flow passes through a new biological nutrient removal system consisting of anaerobic and anoxic selectors and aeration tanks for nitrification. Treated flow is split between two Walker Process secondary clarifiers, then passes through the UV disinfection unit (ITT Water & Wastewater – Wedeco).

Plant effluent cascades down a natural re-aeration channel. It meets

Darrin Boyer, superintendent of the Plano Water Reclamation Facility, performs a microscopic observation in the lab.

The Plano plant is a 2.4 mgd biological nutrient removal facility.


# profile

## Darrin Boyer, City of Plano (Ill.) Water Reclamation Facility

| | |
|---|---|
| POSITION: | Superintendent |
| EXPERIENCE: | 31 years |
| EDUCATION: | Numerous university and trade courses, special classes in biological treatment |
| CERTIFICATIONS: | Class 1 wastewater, Class A potable water, Collection System from Illinois EPA |
| AWARDS: | William D. Hatfield Award, Illinois WEA, 2010 |
| GOALS: | Continue to improve treatment, gear up for next plant expansion and upgrade, continue to explore microscopy of wastewater and biological treatment |


Darrin Boyer inspects the sludge dewatering centrifuge from Alfa Laval, which is fed by a conveyor system from Parkson Corporation.

## KUDOS FROM THE ENVIRONMENTALISTS

The Prairie Rivers Network is a nonprofit organization dedicated to river protection, conservation, and restoration in Illinois. Its mission includes protection of the state's rivers for people, fish and wildlife, and it is an affiliate of the National Wildlife Federation.

The organization has recognized the City of Plano for its efforts to upgrade wastewater treatment and protect the water quality of Big Rock Creek.

In its new guidebook, the Plano Water Reclamation Facility is featured as one of several case studies. "Big Rock is considered by the Illinois Department of Natural Resources to be a biologically significant stream, inhabited by two state-threatened and endangered species," the report says. "In addition, aquatic plant stands and a variety of mussels can be found throughout the stream and downstream of the plant discharge."

The organization goes on to give credit to the city for implementing a seasonal no-discharge system by conveying all treated wastewater to the Cedardell Golf Course for irrigation from April to October. The organization applauds the plant upgrade to biological nutrient removal, as well as the city's management of stormwater to reduce urban runoff pollutants.

Finally, the group notes the city's participation with the Fox River Study Group to study and improve water quality in the Fox River Watershed, with annual support of $0.25 per capita and coordination of activities such as monthly stream monitoring, a ban on phosphorus-based lawn fertilizers, a program for take-back of unwanted medicines, monitoring for endocrine disrupters, and participation in stream restoration projects with the Illinois DNR.

Illinois standards for reuse and recycle, and the flow is diverted to nearby Cedardell Golf Course where it irrigates greens and fairways. Any unused water remaining in the irrigation pond is discharged into Big Creek.

Waste solids are aerobically digested and dewatered to about a 20 percent cake on the centrifuge, provided by Alfa Laval. Contractor Stewart Spreading hauls the cake to area farms where it is spread on land as a Class B biosolids.

The new plant is one of the positive developments in the recent growth in Plano, Boyer believes. "I think overall, the growth has been good, as long as it's well managed," he says. "It used to be we didn't have enough parks for our Little Leagues, but now we do. If growth is taken care of and planned, I think it improves a community's quality of life."

Boyer operates a Cat front-end loader used to move biosolids.

### BIG CHANGE

Boyer prepared well for the changeover from the old activated sludge system that used to serve Plano in less dynamic times. He has spent the last 17 with the City of Plano and holds a Class 1 wastewater certification, a Class A potable water certification, and a Collection System certification with the Illinois EPA. In addition, he has completed numerous training programs with Southern Illinois University, Penn State University, and University of Wisconsin-Madison.

"We've annexed new areas, and in order to build those out, we'll have to expand treatment. Having someone like Darrin on our staff means we don't have to worry about it."

**MAYOR BOB HAUSLER**

He attributes his detailed knowledge of biological nutrient removal in large part to special courses he has taken in Colorado from instructor Ron Schuyler, engineer and microbiologist with Tetra Tech RTW (a Tetra Tech company). "I've taken half a dozen courses out there," he says. "Schuyler gives a fantastic class."

In fact, Boyer could be the poster child for continuing education in the clean water profession. Almost immediately after graduating from high school in 1979 and joining the Plano water reclamation facility staff, he began taking classes to improve his technical and management skills.

"As soon as I was eligible, I wanted to get certified," he says. "I started taking classes. Our city encourages continuing education, and it has paid off. This field is ever changing. If you don't keep up your education, you'll get behind."

"Nine fifth-grade classes visit the facility every year. It's during a time when their studies are involved in working with microscopes. The students and teachers are amazed at the activity they see."

**DARRIN BOYER**

Boyer credits Ralph Pfister of the Yorkville-Bristol (Ill.) Sanitary District for inspiring him, both as a professional wastewater manager and as Boyer's instructor at Waubonsee Community College in Sugar Grove. "He's heavily involved in the field, and I've always respected what he does," Boyer says. "When I received the Hatfield Award recently, Ralph was in the crowd and came up and patted me on the back. That was fun for me."

Boyer's dedication to continuing education has paid off in improved operations at his treatment plant, and it has earned him the admiration of his colleagues. "Darrin is very knowledgeable, especially about anything that's new," says Don Lawyer, operator at Plano, who has worked with Boyer for nine years. "He worked closely with our design engineer to make sure we got the plant we needed to meet the phosphorus limits."

Lawyer says another of Boyer's strengths is his interaction with the city and town board, and his communication with his staff. "He makes sure we get what we need," Lawyer says. "And he makes sure everyone knows what's going on. We're a small staff, and everyone knows how to do everyone's job. Further, Darrin's not afraid to get out there and get dirty. He'll jump right in there with you."

Solids handling operator and maintenance specialist Don Haggard has worked on Boyer's team for six years and credits his boss with a willingness to try new things. "He's innovative," says Haggard. "Recently we've experimented with the city's leaf pickup program, mixing leaves with our biosolids in our sludge handling building to see if we could reduce our waste stream and produce a product that could be used as compost by the city."

In Haggard's view, that's the way Boyer operates — trying new things with an eye to reducing cost. "The compost plan is just one of the examples," he says. "Whenever we purchase equipment, like a large wheel loader we acquired recently, Darrin is always analyzing how it might be used by other departments in the city to save on expense."

Plano Mayor Bob Hausler appreciates Boyer's efforts, too. "Darrin is invaluable to our city," he says. "He's very conscientious and is always trying to find better ways to do his job and make our city a better place." Hausler is happy that Boyer is on his team as the city plans for future growth. "We've annexed new areas," he says, "and in order to build those out, we'll have to expand treatment. Having someone like Darrin on our staff means we don't have to worry about it."

## SHOWING THE KIDS

Darrin Boyer's enthusiasm for his job, and for the microscopy of wastewater, carries over into his efforts to educate the public about clean water. He hosts area school children for tours of the Plano treatment plant. Using the microscope, he shows them the workings of biological treatment and helps them understand the natural processes that protect the area's environment.

"We have been doing this program for about 10 years now," Boyer says. "Nine fifth-grade classes visit the facility every year. It's during a time when their studies are involved in working with microscopes. The students and teachers are amazed at the activity they see. I take what I'm looking at under the microscope and project it on a large TV screen. Every year the students and teachers tell me they are very thankful for the experience."

"About half the time, the students write letters back to me about their visit. The teachers put the letters together and forward them. The students talk about what they've learned about clean water and say they've talked to their parents about what they saw at the plant."

Any chuckles? "Yes," recalls Boyer. "I remember one little girl who wrote to say how much she enjoyed what she called 'the creepy-crawly' and how it helped make a nice clean place for the fish to live." The 'creepy-crawly' was a microscopic view of a live rotifer he enlarged to full screen.

Boyer's colleagues and city officials don't need to be concerned about having their wastewater superintendent around for the next challenge. Boyer, who is from the area and is married with two children, isn't going anywhere soon. "I'm comfortable and I love this job," he says. "The city respects and supports us."

In fact, as he looks into his microscope every other day, Boyer sees beyond ordinary plant activity. "It's a window to the future of your plant," he says. "The permits are approved, and our plant is OK'd for doubling again when development resumes."

When that happens, Boyer will be able to take even more pleasure from his work. "I love to be able to see clean water leaving the plant," he says. "I take great pride in that."

**tpo**

## more info:

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# Priming the Pump

TREATING WASTE FROM A NEARBY ETHANOL PLANT MEANS A NEW REVENUE STREAM AT LOW ADDED COST FOR THE TREATMENT PLANT IN MAIZE, KAN.

By Ted J. Rulseh

Last year Matt Meeks bought a new 50 hp blower and variable-frequency drive for the City of Maize (Kan.) Wastewater Treatment Plant. No city official questioned the purchase — because, after all, Meeks had raised the money.

For nearly two years, the Maize plant has accepted partially treated process water from a nearby ethanol plant at a price of five cents per gallon. With potential to receive as much as 2 million gallons of the water per year, the plant could see $100,000 in annual revenue beyond everyday fees from connected customers.

The plant has ample capacity to take the water, and so far it has had no adverse effects on the process.

## OUTSOURCING TREATMENT

The Maize plant, serving a community of about 3,000 residents, is a 0.5 mgd (design) extended aeration activated sludge facility. Average flow is about 0.25 mgd. "It's a very stable plant," says Meeks, senior water/wastewater controller for the city. "Our worst headaches are from storm surges: We don't have an equalization basin."

In early 2009, the manager of the ethanol plant, half a dozen miles away, approached Meeks to discuss treating the process water.

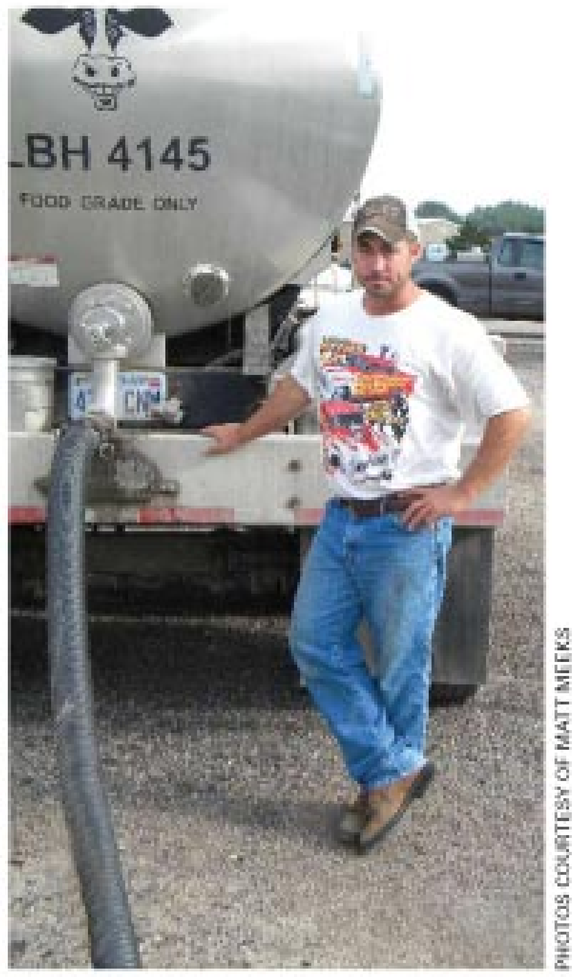
"I told the city council that what we have here is a prime example of how a well-maintained, well-operated plant is an asset to the community that owns it, to the communities around it, and to the environment."

**MATT MEEKS**

The City of Maize treatment plant, a 0.5 mgd extended aeration activated sludge facility, accommodates the ethanol plant process water without upsets.

The water contains on average 30 mg/l BOD and 126 mg/l TSS and has a pH of 9 and 8.0 ppm dissolved oxygen.

Meeks says one issue the ethanol plant has is that under state regulations, any rainwater that collects on the plant grounds is classified as process water and goes to the treatment ponds. Rather than refine its own treatment process and discharge the water under its own permit, the facility prefers to outsource treatment and focus on optimizing ethanol production, Meeks says.




Area farmer Keenan Kelley, owner of Agra Enterprises, hauls the process water from the ethanol plant to the Maize treatment facility.

PHOTOS COURTESY OF MATT MEEKS

Meeks restricts daily deliveries to 50,000 to 60,000 gallons. Deliveries are sporadic and are tied to rain events. The water is delivered in tank trucks. The Maize plant accepted 1 million gallons in 2009 and by the end of June had taken 880,000 gallons in 2010. Trucks empty into the first manhole upstream of the treatment plant's main lift station pumps.

## NO UPSETS

"It seems to work just fine," Meeks says. "We have the excess capacity, and we have such a long detention time that the plant just seems to assimilate it. The main effect we get is a little green color, which I think is from algae cells lysing.

"We just keep an eye on everything to make sure we're not heading toward an upset. We watch the effluent ammonias and pH and the plant DOs. Every now and then we sample what's coming in to make sure it hasn't changed in some fashion. We use a little more energy to treat the water, and maybe we spend a little more money handling the additional digested solids going out."

Maize uses Agra Enterprises, a part-time hauling business owned by area farmer Keenan Kelley, to haul its biosolids to land application sites. The same company hauls the process water from the ethanol plant to Maize.

Revenue from treating the ethanol plant's water is helping Meeks keep plant equipment up to date. Besides the blower and VFD, he

### Share Your Idea

*TPO* welcomes news about interesting methods or uses of technology at your facility for future articles in the How We Do It column.

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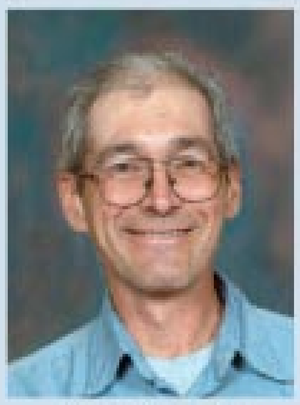
## OPERATOR OF THE YEAR


Matt Meeks

Matt Meeks, senior water/wastewater controller for the City of Maize, received the 2009 Wastewater Operator of the Year award from the Kansas Rural Water Association.

Meeks began his career in 1988 as an employee in the water department at Garden City, Kan., and has worked in public utilities ever since. After four years in Garden City, he earned certification as a Class IV Water Operator. He then gained additional training and went on to other jobs before joining the city of Wichita, where he received Class IV Wastewater Operators Certification. During that time, he earned a four-year degree in environmental science.

In late 2000, he began work for Maize, where he handles water and wastewater operations with the help of other public works employees. Meeks is one of only 76 operators in Kansas who hold Class IV Water and Class IV Wastewater certifications, according to the KRWA.

has purchased a 3 hp submersible in-plant process pump and rebuilt another.

### LOOKING AHEAD

At present, the ethanol plant is building a sewer line to deliver the water to the treatment plant. City officials, recognizing the potential value of that line, negotiated with the ethanol company to upsize it to create capacity for expansion. Meeks observes that Maize has grown rapidly since the city installed a drinking water system in 2003.

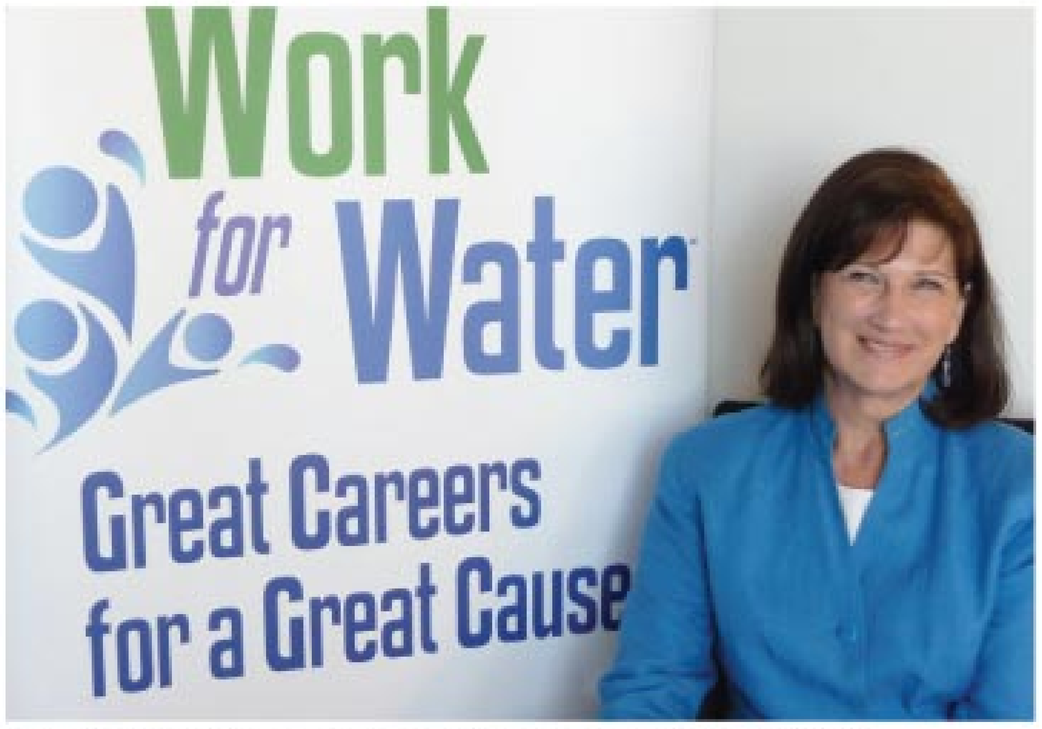
"I told the city council that what we have here is a prime example of how a well-maintained, well-operated plant is an asset to the community that owns it, to the communities around it, and to the environment," says Meeks. "The water we discharge is cleaner than what's in the creek." tpo

# Clarion Call

## WEF AND AWWA ROLL OUT A 'WORK FOR WATER' CAMPAIGN TO INTEREST KEY GROUPS IN THE MANY CAREER OPPORTUNITIES AVAILABLE IN WATER-RELATED PROFESSIONS

By Ted J. Rulseh

Jeanette Brown, executive director of Stamford (Conn.) Water Pollution Control Authority and new president of the WEF Board of Trustees.




Linda Kelly, managing director of communications for WEF.

The statistics are frightening: The average age of wastewater utility workers is 45.4, and in the next 10 years, an estimated 31 percent of all workers in the field will retire. The figures are similar in the water utility sector.

That means the nation's water and wastewater treatment plants will soon face a shortage of qualified people. To address that issue, the Water Environment Federation and the American Water Works Association have launched a "Work for Water" campaign to stir up interest in careers in the industry. They're targeting four groups:

- High school and vocational/technical school students.
- College students.
- Former military service members and career changers.
- People pursuing advanced degrees.

The campaign is brand new — it officially launched in May. But already it has led to connections with entities from the U.S. EPA and the Veterans Administration to a number of colleges and universities.

Under the tagline, "Great Careers for a Great Cause," the program encourages people in a wide age range to consider the water and wastewater sector for challenging, stable, well-paid careers that make a big difference to society and the earth.

"I see a huge value to this Web site in supplementing everything we do to encourage people to come into the water field, and to explain the fun and the joy and the rewards you get out of it."

**JEANETTE BROWN**

To learn more about the campaign, *Treatment Plant Operator* interviewed Linda Kelly, managing director of communications for WEF, and Jeanette Brown, executive director of the Stamford (Conn.) Water Pollution Control Authority and new president of the WEF Board of Trustees.

**tpo: How did the "Work for Water" program come about as a collaborative effort between the two associations?**

**Kelly:** At WEF, we stay close to our members and listen to their needs. In recent years we began to sense a bit of fear about how fast our workforce was aging. As a variety of demographic studies began to coalesce, our Board of Trustees realized that when members of the Baby Boom generation retire in the next 10 to 15 years, the workforce shortage could become very acute.

The board decided the issue was important enough to justify forming a task force. Among that task force's key observations was that this is not just a wastewater and WEF issue. It spreads across all water jobs. They recommended we partner with AWWA and put together a program that would get young people interested in careers in water.

**tpo: Do you see any change today in the receptiveness of younger people to careers in the water sector?**

**Kelly:** Yes. Ten, 15 or 20 years ago, when careers in electronics and other new fields were beginning to arrive, young people were looking for a quick win — for a way to get out there and make money quickly. Frankly, water and wastewater didn't have the same sex appeal that the new careers were offering. We didn't see young people getting into water. We didn't see them going into engineering schools.

Now we see the tables turning. We see that young people care very much about this planet. They care very much about sustainability. It's beginning to swing back to where young people want a job where they can do something truly important, and there's no job that's more important than taking care of the precious and very limited resource that is water.

**tpo: How are WEF and AWWA sharing resources and responsibility in executing this campaign?**

**Kelly:** Last year's WEF president Rebecca West met with AWWA president Craig Woolard. They created a joint task force of five people from each organization.

They tasked Greg Kail, AWWA senior public affairs manager, and me, and our staffs, with execution. Greg and I split up the duties. Because of AWWA's resources in graphic design and creating collateral materials, Greg took on that area, and they created the logo.

Given my experience with IT and the Web, I took charge of the campaign Web site, www.workforwater.org. We worked with the two organizations' committees to identify Web site content that would reflect the goals of the program. We met those goals head-on. It's an attractive site, and we believe it's also quite appealing to younger people.

**tpo: As a practical matter, how would someone working for a city or a water or wastewater utility make use of this Web site?**

**Brown:** Managers at most treatment plants do a lot of outreach to school systems. Here in Stamford, we give tours to more than 2,000 students every year. One thing we want to do next year for middle school and high school students is have them look at the Web site and then talk to them about careers in wastewater treatment. Then when they take tours, we can show them on a practical basis what they would do in those roles.

Next year I intend to have one of our mechanics, one of our operators, and one of our lab scientists break the students into groups and talk to them about what they do on a daily basis.

I also see value for general recruiting of people beyond high school. For example, every year I get invited to career development seminars with people who are out of work and looking for where they can go now that their job has moved away. That's another good opportunity to use the "Work for Water" campaign.

I also teach a wastewater design course at Manhattan College, and as part of that I try to encourage students to go into operations. I see a huge value to this Web site in supplementing everything we do to encourage people to come into the water field, and to explain the fun and the joy and the rewards you get out of it.

**tpo: What sorts of partnerships are developing around this campaign?**

**Kelly:** The U.S. EPA wanted very much to be a partner because they also recognize the need to bring new people into the world of water. They got in on the ground floor. They worked with us to develop the video that starts as soon as someone visits the Web site home page.

AWWA initiated contact with the Veterans Administration, knowing the VA is very interested in getting this information in front of veterans who are returning to civilian life. The EPA actually facilitated our contact with the VA. As we and our partners begin to network, we're seeing a lot of interest. We welcome everyone who has a relevant role to jump on the wagon and provide additional means of outreach.

**tpo: What is your approach to reaching high school students with your messages?**

**Kelly:** We wanted to make sure we showed them the depth and breadth of opportunity. One thing we do is list the job descriptions and all the opportunities that are out there. In the introductory video, we hit that with visuals, audio and narrative. In addition, from working with high school counselors, we see that they don't know enough about opportunities in the water sector. So one of our goals is to get information to them so that they can tell a student, "Here's another way to go."

**tpo: How does your approach differ when attracting college students?**

**Kelly:** We know they are very interested in scholarships. The WEF Member Associations and AWWA sections have scholarships,

"The water professionals are the champions. They are the ones in the community. They are the ones who will take this program forward in mass numbers. We want to make sure they have the tools they need."
**LINDA KELLY**

and we're collecting information on those. We want to act as a clearinghouse for scholarships for students who want to explore careers in water.

We also want to help them get involved in student chapters of AWWA and WEF and network with other young people trying to find the right spot in the water sector. We have some established relationships with chapters at universities. We want to prepare professors to talk to students and direct them to careers in water.

One of our next initiatives is to find our way into all the college venues. How do we get to the community colleges that have water or wastewater programs and help them steer people toward operations and maintenance and lab work? If a community college doesn't have a program, how can we help them start one?

The "Work for Water" campaign Web site, www.workforwater.org.

**tpo: Why are former military people an important audience?**

**Kelly:** We've seen that a lot of people leaving the military or retiring from the service at a young age have skills that are readily applicable to many of the jobs in water. We want to be sure they realize that this may be a great second career for them — a chance to take those skills they learned in their military careers and apply them.

**tpo: Why is it important to reach students pursuing advanced degrees in the sciences?**

**Kelly:** We really need people to go on beyond a bachelor's degree and get into research for the future. Water issues are very complicated and getting more so. For example, if we're talking about microconstituents and pharmaceuticals in water, and the potential

impacts, those are very important topics. We need young people to put their minds to work and help secure the future of clean water.

**Brown:** When you look at all the potential careers associated with water, there is something for anybody who has any kind of interest whatsoever in science, engineering, mechanics, electronics or instrumentation. It's just a question of getting the information out there and getting young people, veterans, and people who are changing careers to see all the good things about working in this incredible profession.

In the Resources for the Water Professional section of the Web site, we put a lot of that information, so our people don't have to reinvent the wheel when they're figuring out how to attract students, or how to put recruitment, retention or succession planning processes in place. That has been extremely popular.

Our water professionals are the champions. They are the ones in the community. They are the ones who will take this program forward in mass numbers. We want to make sure they have the tools they need.

"When you look at all the potential careers associated with water, there is something for anybody who has any kind of interest whatsoever in science, engineering, mechanics, electronics or instrumentation."

**JEANETTE BROWN**

**tpo: How well does stability of jobs in water resonate in today's economy?**

**Brown:** We've seen interest among people who have been laid off from other jobs. We recently hired three people who had been out of work from other jobs for a considerable time. One thing we asked them was why they were applying, and a lot of it was because they felt there was stability in the wastewater field. It wasn't simply that city jobs are stable, because they've seen cities laying off people. But they saw stability in the wastewater area.

**tpo: How would you characterize the reaction to "Work for Water" so far?**

**Kelly:** It has been remarkable. One thing we've discovered is a fifth audience: water professionals themselves. We've often heard members say, "What can you give me so that when I go to a career fair or take kids on a tour, I can guide them to the jobs?"

**tpo: If you can have your way, where will the "Work for Water" program be in a year from now?**

**Kelly:** We took the first plunge quickly and got a great deal done right up front. Now we need to go back to our campaign to-do list and start checking off those items. We want to firm up and establish partnerships with lots of universities and with government agencies: EPA, VA, perhaps the Department of Education.

We want kids to be able to quickly find the information they need. To that end, we want to get closer to the top of Google and Yahoo! We need to invest in search engine optimization, so when people search for a career in water, we come up first. For now, it's simply great that WEF and AWWA could come together as the two big water organizations and do this. **tpo**

# people/awards

**Cowlitz County's Toutle Wastewater Treatment Plant** received the Wastewater Treatment Plant Outstanding Performance Award from the State of Washington.

The **Elkton Wastewater Treatment Plant** received the System of the Year Award from the Maryland Rural Water Association.

**Audrey Yokota** has been named the chairwoman of the Hawaii Section of the American Water Works Association.

**Lawrence E. Quick** has been named the president of the Illinois Association of Water Pollution Control Operators.

**Angela Krause** and **Madelyn Rubin** of the University of South Florida won the Student Design Competition Award from the Florida Water Environment Association.

The **Arkansas Water Works & Water Environment Association** announced the following award recipients:

- Tim Luther, CH2M Hill, Wastewater Manager of the Year
- James N. Carlock, Osceola, Wastewater Outstanding Achievement (pop. > 5,000)
- Bradley Scheffler, Piggott, Wastewater Outstanding Achievement (pop. < 5,000)
- Winthrop Rockefeller Institute-Central District, Wastewater-Special System Recognition
- Hoxie-Northeast District, Wastewater-Special System Recognition
- City of Blevins-Southwest District, Wastewater-Special System Recognition

The **Missouri Water Environment Association** announced the following award recipients:

- Mike Henderson, La Grange, Operator of the Year Award (< 5 mgd)
- Steve Harrison, MSD, Operator of the Year Award (> 5 mgd)
- Rock Creek Public Sewer District, Treatment Plant of the Year Award (< 5 mgd)
- City of Independence, Treatment Plant of the Year Award (> 5 mgd)
- City of O'Fallon, Collection System Safety Award (< 5 employees)
- Northeast Public Sewer District, Collection System Safety Award (> 5 employees)
- City of Wentzville, Treatment Plant Safety Award (< 10 employees)
- City of St. Peters, Treatment Plant Safety Award (> 10 employees)

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

## Alaska

The Alaska Water Wastewater Management Association has these courses:

- Nov. 1-5 – Intro to Small Wastewater Systems, Anchorage
- Nov. 8-12 – Intro to Small Wastewater Systems, Fairbanks
- Nov. 15-18 – Manganese Greensand Filtration Systems, Fairbanks
- Dec. 2-3 – Sustained Compliance, Fairbanks

Visit www.awwma.org.

## California

The California Water Environment Association has a Safety Training Day on Nov. 10 in Carlsbad. Visit www.cwea.org.

## Canada

The Atlantic Canada Water & Wastewater Association has a Wastewater Treatment Level 1 and 2 course Nov. 16-19 in Halifax, N.S. Visit www.acwwa.ca.

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

## Illinois

The Illinois Water Environment Association has a Collection Systems Seminar course on Nov. 4 in Lisle. Visit www.iweasite.org.

## Michigan

The Michigan Water Environment Association has these courses:

- Nov. 2 – Health and Safety, East Lansing
- Dec. 8 – Process Seminar, East Lansing

Visit www.mi-wea.org.

## North Carolina

The North Carolina Water Environment Association has an Operators Seminar Series Nov. 30-Dec. 1 in Raleigh. Visit www.ncsafewater.org.

## Ohio

The Ohio Water Environment Association has a Biosolids Workshop on Dec. 9 in Columbus. Visit www.ohiowea.org.

## Texas

The Texas Water Utilities Association has these courses:

- Nov. 9-11 – Wastewater Lab, Kingsville
- Dec. 14-16 – Wastewater Collection, Waco

Visit www.twua.org.

## Wisconsin

The Wisconsin Department of Natural Resources has these courses:

- Nov. 9 – Basic Math, Madison
- Nov. 9 – Microscopy, Green Bay
- Nov. 10 – Security and Emergency Planning for Utilities, Madison
- Nov. 11 – Water Supply Safety, Fond du Lac
- Nov. 16 – Microscopy, Madison
- Dec. 7-8 – Utility Management, Madison

Visit www.dnr.state.wi.us/org/es/science/opcert/training.htm.

The University of Wisconsin Department of Engineering-Professional Development has a Collection System Engineering (L691) course Dec. 7-9 in Madison. Visit www.epdweb.engr.wisc.edu. **tpo**

## CALENDAR OF EVENTS

**Nov. 1-3**
Kentucky Water and Wastewater Operators Association, Ramada Inn, Lexington, Ky. Visit www.kwwoa.org.

**Nov. 3-5**
Nebraska Water Environment Association Fall Conference, Holiday Inn, Kearney, Neb. Call 402/399-1329 or visit www.ne-wea.org.

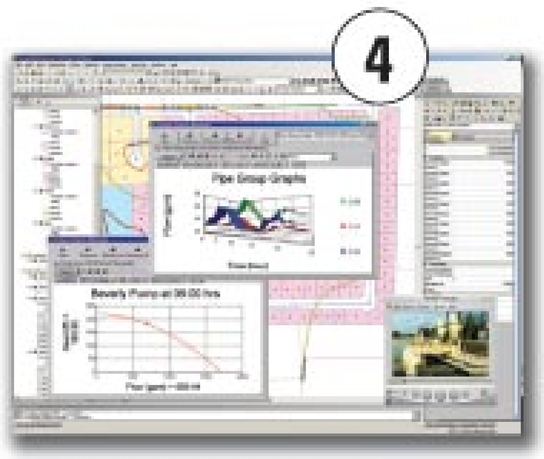
**Nov. 9-10**
Georgia Association of Water Professionals Fall Conference & Expo and Laboratory Symposium, Dalton, Ga. Visit www.gawponline.org.

**Nov. 14-18**
Water Quality Technology Conference & Exposition, Savannah, Ga. Visit www.awwa.org.

**Nov. 16-18**
Indiana Water Environment Association Annual Conference, Indianapolis. Call 317/686-2664 or visit www.indianawea.org.

**Nov. 18-19**
HWEA/AWWA Hawaii Section Water Reuse Biennial Conference, Maui. Visit www.awwa-hi.org.








## 1. LAROX INTRODUCES KNIFE GATE VALVES

The Knife Gate Valve from Larox features a J-ring design. Removable seats on both sides of the blade provide a bi-directional seal. The flanged, wafer and high-pressure valves are available with pressure ratings up to 300 psig and diameters from 2 to 24 inches. Other features include easily replaceable ring sleeves, full bore, bi-directional flow, no seat cavity and no packing gland. **410/636-2250; www.larox.us.**

## 2. FCI OFFERS ST98L INLINE MASS FLOW METERS

The ST98L inline mass flow meter from Fluid Components International is made for virtually any air or gas mixture in 1- to 2-inch small process lines. Available in two different flow element styles, the –F element is made for applications in dry, clean air/gases with fluid temperatures to 350 degrees F, while the –S style is made for demanding applications involving dirty or erosive fluids, high-moisture content gas or pulsating flow. The –S element features robust, thick wall thermowells, and an unshrouded equal mass sensor element for noise-filtered response, extended erosion resistance and easier cleaning. The flow meter has an accuracy rating of ± 1 percent and repeatability of ± 5 percent. The sensing element has two all-welded 316L stainless steel thermowells that protect two matched platinum precision resistance temperature detectors. **800/854-1993; www.fluidcomponents.com.**

## 3. ROTEX OFFERS GYRATORY RECIPROCATING SCREENERS

Gyratory Reciprocating Screeners from Rotex Global are designed to separate dry materials at high production rates. Features include a gyratory-reciprocating motion and positive screen mesh cleaning system. The gyratory-reciprocating motion of the near-horizontal screen surface gives undersize material the maximum opportunity to pass through the mesh openings without loss of near-size material. The motion also produces a continuous mesh cleaning action that prevents material from lodging in the openings. Screens can range from one to five screen surfaces for separation with openings of 1/2 inch to 325 mesh. Optional floor mounting, cable suspension and mounting on a structural steel framework are available. **800/453-2321; www.rotex.com.**

## 4. MWH SOFT INTRODUCES INFOWATER MODELING SOFTWARE

InfoWater Generation V8 hydraulic modeling software from MWH Soft is designed for ArcGIS 10. Built atop ArcGIS, InfoWater integrates advanced network modeling and optimization functionality with the latest generation of ArcGIS, enabling engineers to perform complex hydraulic analyses, including multi-point and extended period fire flow simulations, variable-speed pumps and advanced water quality calculations. **626/568-6868; www.mwhsoft.com.**

## 5. ALMATEC OFFERS CHEMICOR SERIES PUMPS

CHEMICOR Series metal pneumatic diaphragm pumps from Almatec have soft contour product chambers for smooth flow and now dead spots. Designed for chemical flow, pump options include pulsation damper, back-flushing system, barrier chamber system, diaphragm monitor, stroke counting and extended special ports for use in sanitary conditions. The pumps are available in three sizes: 20 gpm, 40 gpm and 100 gpm. **www.almatec.de.**

## 6. CONTROL MICROSYSTEMS RELEASES CLEARSCADA 2010

ClearSCADA 2010 client-server enterprise software from Control Microsystems offers improvements for remote control and telemetry, enhanced connectivity to databases (SQLServer, Oracle, MySQL), improved security and enhanced alarm handling. To simplify access control and improve security management, the software offers Windows authentication for centralized management of passwords and disabled user accounts. **888/267-2232; www.controlmicrosystems.com.**

## 7. ENDRESS+HAUSER OFFERS PRESSURE TRANSMITTERS

The M-Class Deltabar M PMD55 transmitter and Cerabar line of pressure transmitters from Endress+Hauser are ATEX, FM, CSA, NEPSI and IEC Ex certified for use in hazardous areas. The M-Class transmitters



have a 4-20 mA, two-wire analog output with superimposed HART 6.0 digital communications. Remote operation is available via a HART Field Communicator handheld terminal or the wireless Field Xpert PDA with integrated 3.5-inch touchscreen. The Deltabar pressure transmitter, available in four models, can be used for flow measurement of gases, vapors and liquids. The Cerabar transmitter, available in three models, can be used for measuring absolute and gauge pressure of gases, steam or liquids. **888/363-7377; www.us.endress.com.**

### OMI INTRODUCES ECOSORB SPRAY GEL

Ecosorb spray gel odor control from OMI Industries is designed for topical applications onto solid and semi-solid materials that emit odors, including solid waste materials, wastewater sludge, compost materials and remediation soil. The spray applies a thin, semi-liquid gel film onto the surface of the odorous material, absorbing and controlling the odor molecules. There is no masking of odors via fragrances. **800/662-6367; www.omi-industries.com.**

### 8. LECHLER OFFERS STAMM SELF-CLEANING SHOWERS

STAMM self-cleaning showers and oscillators from Lechler, made for use in wastewater treatment plants, feature octagonal flat fan nozzles in spray angles from 15 to 75 degrees as well as round 0 degree or solid stream (needle jet) versions. The flat fans are self-aligning when used with STAMM bases. **800/777-2926; www.lechlerusa.com.**

### 9. FIBOX OFFERS ARCA JIC ENCLOSURES

ARCA JIC enclosures from Fibox Enclosures are manufactured using injection-molded polycarbonate (PC), offering ease of customization, chemical resistance, and functionality across a wide temperature range. The units are UL listed and NEMA 4X rated and come in 10 standard interior enclosure sizes. All sizes offer transparent or opaque screw and hinged covers, plus latch options. There is a complete range of mounting plates, plus fixed and hinged inner panels. Enclosures come with standard wall-mounting feet or optional mounting flanges. **888/342-6987; www.fiboxusa.com.**

### 10. EAGLEBURGMANN OFFERS DIAMOND SEAL FACE COATING

DiamondFaces seal face coating from EagleBurgmann features a microcrystalline coating on a silicon carbide seal face designed to reduce maintenance and increase service life for pump operators. The coating allows for dry-run periods up to several hours and reduces sliding-face friction. **713/939-9515; www.eagleburgmann.com.** *(continued)*

## product spotlight


EcoFilter biological air treatment system from BioAir Solutions

# EcoFilter from BioAir Uses Microorganisms to Remove Odor

By Ed Wodalski

The EcoFilter biological air treatment system from BioAir Solutions offers a sustainable, non-toxic way to treat odors at municipal wastewater treatment plants. The system uses biotrickling filter technology and a structured synthetic media that removes more than 99.5 percent of hydrogen sulfide and 95 percent of all odors without chemicals or carbon adsorbents.

The system's uniform airflow, optimized mass transfer and controlled microenvironment facilitate proliferation of specific odor-removing bacteria. The filter is available in a range of sizes and configurations and can treat airstreams from 75 cfm to more than 100,000 cfm.

The system is not a bioscrubber, says Louis D. le Roux, company president. "A bioscrubber is basically a tower containing media that is irrigated with recirculated water," he says. "Much of the biology resides in the liquid, rather than on the media. In the biotrickling filter, you don't recirculate water — it's a once-through system. The bacteria adhere to the media inside the reactor, so it's a fixed-film reactor that allows for stratification of different types of bacteria. This enables removal of inorganic and organic odors in a single reactor vessel."

With an estimated lifespan of more than 10 years, the low-maintenance filtering system includes a blower that moves air through the bioreactor, a control panel, and a programmable logic controller that can be connected to a SCADA system for remote viewing. "It's a low-operating-cost system," le Roux says. "The bacteria don't charge you anything to do the work."

BioAir has collaborated with North Carolina State University on the use of molecular biology tools using gene probing and DNA extraction to identify bacteria inside the reactor for optimum performance. Through further research, the company reduced residence time to about three seconds, similar to that of a chemical scrubber.

For plants not ready to abandon their existing technology, the filter unit can be installed in series before a chemical scrubber or carbon system to reduce operating costs. The modular system also can be rented, leased to purchase, and customized. **856/258-6969; www.bioairsolutions.com.**







## 11. CHARLES AUSTEN OFFERS ENVIRO ET LINEAR PUMP

The enviro et linear pump from Charles Austen Pumps is available in a range of models and flow rates from 30 l/min to 250 l/min. Designed for intermittent or continuous duty, the pumps can be retrofitted to current tank installations or cesspit conversions. Other enviro linear pumps include the etx with safety tip that stops the pump in the event of diaphragm failure and the sw submersible water pump designed for use inside a treatment tank. The pump is available with stainless steel or plastic casing. Performance ranges from 2,500 l/hr to 20,000 l/hr. **www.charlesausten.com.**

## 12. HACH RELEASES FL900 SERIES FLOW LOGGER

The FL900 Series Flow Logger with Marsh-McBirney Flo-Dar Sensor from the Hach Co. is designed to reduce site time while increasing the safety of flow monitoring personnel. The logger features instant verification of on-site operation/communication, real-time alarms sent directly to e-mail or mobile phones and intuitive setup and data management software. The non-contact sensor eliminates sensor maintenance and the need for confined-space entry. Wireless FL900 Flow Logger models utilize Hach FSDATA Web-based software, eliminating site visits to collect flow data. **800/368-2723; www.hachflow.com/fl900.**

## 13. RESPIROMETRY PLUS INTRODUCES SIMPLIFIED RESPIROMETER

Based on the same principles as the fully automatic Arthur Respirometer, the Simplified Respirometer from Respirometry Plus delivers a manual readout for toxicity, treatability, nitrification/denitrification and organic lead measurement, but without temperature control. **800/328-7518; www.respirometryplus.com.**

## 14. ORBECO-HELLIGE INTRODUCES PRIMARY CHLORINE KIT

The EZ Mix primary chlorine standard kit from Orbeco-Hellige is designed to prepare a 1.5 mg/l chlorine standard without the use of additional pipettes or other glassware and can be used to comply with U.S. Environmental Protection Agency Method 334.0. **800/922-5242; www.orbeco.com.**

## 15. McCROMETER INTRODUCES FPI MAG ELECTROMAGNETIC FLOW METER

The FPI (full profile insertion) Mag electromagnetic flow meter from McCrometer features additional sensing electrodes for increased sensitivity and is packaged in a heavy-duty, 316 stainless steel sensor body. The sensor is coated with a NSF-certified 3M fusion-bonded epoxy for operational longevity. The meter's compact design fits in confined spaces and installs without interrupting service, dewatering lines, cutting pipe or welding flanges. Its multi-electrode sensor compensates for variable flow profiles, including swirl, turbulence and low-flow conditions. It has an accuracy rating of ± 1 percent. **800/220-2279; www.mccrometer.com.**

## 16. TRIPLEPOINT OFFERS MARS AERATION SYSTEM

The MARS Aeration System from Triplepoint Water Technologies features lagoon diffused aeration technology that incorporates mixing and aeration into one portable unit. Designed to boost oxygen, improve effluent quality and lower wastewater lagoon operating costs, individual units can be lowered into the treatment cell from the surface and easily raised for inspection. No draining of the lagoon or fixed piping is required. The system utilizes high-efficiency fine-bubble diffusers for high production and low energy use. Each aerator also integrates a dedicated mixing component to prevent sludge accumulation. **630/208-0720; www.triplepointwater.com/wastewater.**

## 17. ITS INTRODUCES EXACT MICRO 8 PHOTOMETER

The eXact Micro 8 advanced photometer from Industrial Test Systems tests for iron, pH, ammonia, phosphate, sulfide and cyanide. It also offers a transmission mode that can be used to test an additional 11 parameters, including hardness, chloride/salt, biguanide, alkalinity and more. The handheld unit has a built-in timer for streamlined testing and 140 test memory. **800/861-9712; www.sensafe.com.** tpo


PHOTO COURTESY OF JIM DARGIE

Since Milford's nickname is The Granite Town, and since it's located in the Granite State of New Hampshire, a sign made of granite seemed like the only way to go.

# Cast in Stone

## GRANITE WAS THE PERFECT MEDIUM FOR A NEW SIGN THAT GRACES THE ENTRANCE TO THE TOWN OF MILFORD WATER AND WASTEWATER DEPARTMENTS

By Jeff Smith

Five years ago, when officials in the Town of Milford combined the water treatment and wastewater treatment plants under one roof, they decided to create a new sign to reflect more than just the unity of two municipal utility departments.

Since Milford's nickname is The Granite Town, and since it's located in the Granite State of New Hampshire, a sign made of granite seemed like the only way to go, says Jim Dargie, operations foreman at the wastewater treatment plant.

"We take an awful lot of pride in what we do in this plant, and we wanted the sign to reflect that," Dargie says. The town held a contest to design a town logo. Larry Anderson, wastewater plant superintendent at the time, worked with the town planning board to set the ground rules and choose the winner.

The winning design, from Milford resident Dwayne Hammond, depicts the historic town hall and town center gazebo, enclosed within an oval. "The logo is not only on our sign, but on T-shirts and the doors of our town trucks," Dargie says.

It's also carved into the 5-foot-high, 3-foot-wide, half-foot-thick New Hampshire granite sign that points the way to the treatment plant, which handles a daily flow of 2.15 mgd and a peak flow of 6.45 mgd. The sign is supported by two 1-foot-square granite pillars, and the decorative base is made of six 10-inch-wide granite stones, each five feet long. The entire structure is adorned with daylilies and an evergreen shrub.

The sign stands between a Dunkin Doughnuts shop and Shaw's Shopping Plaza on State Highway 101A and is seen by almost everyone passing through town. "It's right where the highway from Nashua narrows from four lanes to two lanes, so everybody sees it," Dargie says.

Plant employees installed the sign in November 2007. The $5,050 cost was covered with funds for property supplies, half from the water budget and half from the wastewater budget. "It was fun to do, and I think everyone likes to see the sign," says Dargie.

The Milford Wastewater Treatment Plant serves the nearly 16,000 residents with advanced secondary treatment using the activated sludge process. **tpo**

### Share Your Ideas

***TPO* welcomes news** about interesting features of your facility's grounds, signage or buildings for future articles in the PlantScapes column. Send your ideas to editor @tpomag.com or call 877/953-3301.

## MAKEOVER IN WATERVILLE

A new sign now greets visitors to the Waterville (N.Y.) Wastewater Treatment Plant. Plantings in a built-in flower box create an extra cheerful impression of the facility.

The new sign was created and installed last year under the direction of plant operator Louis Langone, according to Anthony (Jamie) Bechy, superintendent of Public Works for the village. It replaced an aging sign with plain black lettering on white background.




PHOTO COURTESY OF ANTHONY (JAMIE) BECHY

# Tanks, Structures and Components

By Benjamin Wideman

## HEAT TRANSFER

The Hydroheater from Hydro-Thermal Corp. is a direct steam injection heat transfer device for pre-heating or recirculation of biosolids. It optimizes digester efficiency by maintaining a tight temperature band, thus increasing biological activity and solids reduction. It is designed for liquid heating processes in which fouling is a concern.

Hydroheater from Hydro-Thermal Corp.

With a self-cleaning design, the unit prevents plugging, fouling and scale buildup. Other benefits include: instantaneous transfer of heat from steam to liquid, precise temperature control to within 0.5 degrees F, reduced bacteria and energy usage, reduced maintenance, and no ancillary discharge. **262/548-8900; www.hydro-thermal.com.**

FDO Assembly from Assmann Corporation of America

## DRAIN OUTLET

Assmann Corporation of America offers the Full Drain Outlet (FDO) assembly for tanks 2,500 gallons and larger. The outlet lets users drain the tank without mechanically installed nozzles and can be used where heavy solids or salts may accumulate in the bottom of the tank.

The device can help eliminate difficult maintenance, stands up to virtually any service condition and is available with multiple expansion joint options. The outlet is available in 3- and 4-inch sizes and in 316 stainless steel, titanium and hastelloy construction. A replaceable polyethylene flange allows the adapter to be removed for tank installation. **888/357-3181; www.assmann-usa.com.**

## BLOWER PACKAGE

The 50-100 hp IQ blower package from Gardner Denver delivers pressure to 15 psig, vacuum to 16 inches Hg, and airflow from 200 to 1,400 cfm. The design reduces sound levels by as much as 20 dBA. Intelligent digital monitoring is standard with the AirSmart controller. The product has an integrated, full-voltage starter or optional variable-frequency drive for efficiency. A removable discharge silencer provides package integrity and end-user flexibility. **800/682-9868; www.iqblower.com.**


IQ blower package from Gardner Denver

## QUIET BLOWER

The Qube 400 blower from Tuthill Vacuum & Blower Systems includes a noise-reduction system, up to 18 psig of available pressure, and less than 75 dBA at one meter at 4,800 rpm/15 psig. The unit is a quick-delivery solution for wastewater aeration. **800/825-6937; www.tuthill.com.**


Qube 400 blower from Tuthill Vacuum & Blower Systems

TITAN MBR System from Smith & Loveless

## FIELD-ERECTED TANKAGE

Smith & Loveless offers the pre-engineered TITAN MBR System of field-erected tankage for large-volume MBR treatment, delivering up to 3 mgd per tank. Submerged in the aeration section of the unit's rounded tank, the S&L Flat-Plate Membrane maintains high permeability and flux rates even at peak day rates. Because the system uses air scouring to prevent fouling, it does not require back-pulsing. It comes in standard and custom designs and in flow capacities from 5,000 gpd to 3 mgd and larger. The system meets effluent requirements of less than 3 mg/l BOD, 1 mg/l TSS, 2 mg/l TKN, and 1 mg/l NH3. **913/888-5201; www.smithandloveless.com.**

## AIR STRIPPER

The BREEZE VOC removal system from Aeromix Systems is a compact, low-maintenance air stripper that can remove nearly 100 percent of volatile organic compounds (VOCs) and other gases dissolved in water. The unit works as a stand-alone system or with other treatment technologies. Single units handle flow rates up to 200 gpm. **800/879-3677; www.aeromix.com.**

BREEZE VOC removal system from Aeromix Systems

Wastewater tanks from Aquastore

## STEEL TANKS

Aquastore offers glass-fused-to-steel wastewater tanks in which each steel panel is permanently fused with silica glass coating at 1,500 degrees F in a factory-controlled furnace to create an inert bond that contains corrosive liquids and gases with minimal maintenance. Tanks require no repainting over their life cycle. They are available in capacities up to more than 6 million gallons. **503/678-2533; www.aquastore.com.**

## MEMBRANE DIFFUSERS

Stamford Scientific International offers PTFE (polytetrafluoro ethylene) layered EPDM disc and tube diffuser membranes. PTFE membranes have shown high resilience in aggressive applications. **845/454-8171; www.stamfordscientific.com.**

EPDM disc and tube diffuser membranes from Stamford Scientific International

## MIXING SYSTEM

The PPC-3101 mixing system from Pulsair includes 104 stainless steel accumulator plates attached to the floor of each basin, plus 26 injection valves in five pre-plumbed cabinets located around the outside of the basin perimeter.

**PPC-3101 mixing system from Pulsair**

A PLC-based controller and custom software operate each mixing system. The Pulsair process sequentially introduces compressed air under the accumulator plates, creating large single bubbles. The bubbles keep the solids in suspension and evenly distributed throughout the liquid. Maintenance is reduced because there are no pumps, rotating seals or other moving parts in the tank. **800/582-7797; www.pulsair.com.**

**Bolted stainless steel tanks from American Structures**

## BOLTED STEEL TANKS

Bolted stainless steel tanks from American Structures offer a long-lasting waste storage solution. Stainless steel helps ensure long life with minimal maintenance. Specially designed parts ensure durability. **715/235-4225; www.ameristruc.com.**

## COATING SYSTEM

The RTP (rolled, tapered panel) storage containment system from Tank Connection has an LIQ Fusion 7000 FBE coating system that is NSF 61 approved. The system is field installed from grade level using a special synchronized jacking system. RTP construction is available in bolted tank sizes up to 10 million gallons. **620/423-3010; www.tankconnection.com. tpa**

**RTP storage containment system from Tank Connection**



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# MARCH 2-5, 2011

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# EDUCATION DAY

## WEDNESDAY, MARCH 2ND

WWW.PUMPERSHOW.COM

### SSCSC — Southern Section Collection Systems Committee

| | |
|---|---|
| 8 a.m. | Sewer Collection System History & the Evaluation of Pipeline Materials and Problems |
| 9:30 a.m. | Combo Vacuuming, a Forgotten Art |
| 11 a.m. | Keeping your Standard CCTV Inspection Program Relevant |
| 1 p.m. | Growing Your Business by Building Your Company Image |
| 2:30 p.m. | Pump and Lift Station Fundamentals: How to Achieve Maximum Service and Reliability |
| 4 p.m. | Making Sense out of Nozzle Nonsense |

### NOWRA — National Onsite Wastewater Recycling Association

| | |
|---|---|
| 8 a.m. | Troubleshooting Our Modern Waste Stream |
| 9:30 a.m. | Pumps – A Basic Understanding |
| 11 a.m. | System Remediation – Why, What, When, Where and How? |
| 1 p.m. | Selling the System to Site Conditions |
| 2:30 p.m. | Sampling Sewage Treatment Systems |
| 4 p.m. | Effluent Dispersal and Water Management |

### NAWT — National Association of Wastewater Transporters

| | |
|---|---|
| 8 a.m. | So You Think You Want to Own a Waste Treatment Facility? |
| 9:30 a.m. | Grease as a Resource |
| 11 a.m. | Resource Recovery – Methane and Septage |
| 1 p.m. | O & M Problems on Drip Distribution Systems |
| 2:30 p.m. | O & M Problems We Have Seen |
| 4 p.m. | O & M Problems with Media Filters |

### NEHA — National Environmental Health Association

| | |
|---|---|
| 8 a.m. | The Qualified O & M Service Provider |
| 9:30 a.m. | Effluent Screens and Filters for Onsite Applications |
| 11 a.m. | Develop Champions for Your Decentralized Wastewater Projects |
| 1 p.m. | The Business of Management |
| 2:30 p.m. | Developing O & M Inspection Actions |
| 4 p.m. | Working with Regulators, Regulations & Industry |

### NASSCO — National Association of Sewer Service Companies

| | |
|---|---|
| 8 a.m. | Grout: Its Use and Application for the Total Collection System |
| 9:30 a.m. | Cured-In-Place Pipe |
| 11 a.m. | Pipe Bursting Tools for Everyday Utility Installations |
| 1 p.m. | How Will You Know if You Need to do a Sewer System Evaluation Survey (SSES)? |
| 2:30 p.m. | Laser Profiling Applications for Documenting Piping System Conditions |
| 4 p.m. | Advancements in UV Technology for Curing CIPP |

### SCOTT HUNTER — Business Track

| | |
|---|---|
| 8 a.m. | Creating an Extraordinary Organization – The Mindset of Leadership (Part 1) |
| 9:30 a.m. | The Mindset of Leadership (Part 2) |
| 11 a.m. | The Mindset of Leadership (Part 3) |
| 2:30 p.m. | Creating an Outrageously Successful Organization (Part 1) |
| 4 p.m. | Creating an Outrageously Successful Organization (Part 2) |

### WJTA — WaterJet Technology Association

| | |
|---|---|
| 8 a.m. | Estimating the Vacuum Job for Fun and Profit |
| 9:30 a.m. | How to Maximize the Power of Your Waterjetter |
| 11 a.m. | Waterjetting – Financial Startup Considerations and Real-World Application |

### PSAI — Portable Sanitation Association International

| | |
|---|---|
| 1 p.m. | Understanding Your True Cost per Service for Special Events - Part 1 |
| 2:30 p.m. | Understanding Your True Cost per Service for Special Events - Part 2 |

### SMS — Safety Management Systems

| | |
|---|---|
| 4 p.m. | Avoiding Violation Fines and Tickets with DOT Safety Compliance |

## ADDITIONAL SESSIONS

### THURSDAY — MARCH 3RD, 2011
8 A.M. - NOON

18 SESSIONS COVERING THE FOLLOWING TOPICS:

Liquid Waste, New Business, CCTV, Grouting Techniques, Marketing, Septic Installation, Manholes, Drainfields and Much More!

ONSITE INSTALLER COURSE - 8 a.m. - 5 p.m.

### FRIDAY — MARCH 4TH, 2011
8 A.M. - NOON

17 SESSIONS COVERING THE FOLLOWING TOPICS:

Pipe Inspection, CIPP, Marketing, Business Strategies, Portable Restrooms, Grease, Data Logging, Water Jetting and Much More!

**DETAILED SESSION INFORMATION AVAILABLE AT:**

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# tpo CLASSIFIED ADVERTISING

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## EDUCATION

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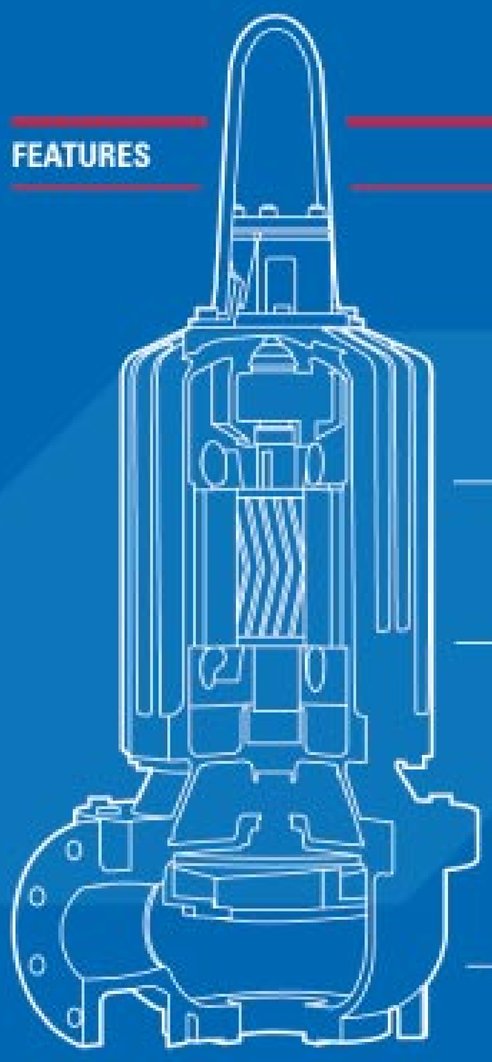
## FEATURES



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