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DEDICATED TO MUNICIPAL WASTEWATER PROFESSIONALS

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

SUBSCRIPTION INFORMATION: A one year (12 issue) subscription to *TPO*™ in the United States and Canada is free to qualified subscribers. A qualified subscriber is any individual or company in the United States or Canada that partakes in the consulting, design, installation, manufacture, management or operation of wastewater treatment facilities. Subscriptions to all other foreign countries cost $80 per year. Non-qualified subscriptions are available at a cost of $60 per year in the United States and $120 per year outside of the United States. To qualify, return the subscription card attached to each issue; visit www.tpomag.com; or call 800-257-7222.

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

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

EDITORIAL CORRESPONDENCE: Address all editorial correspondence to Editor, *TPO*, P.O. Box 220, Three Lakes, WI, 54562 or e-mail editor@tpomag.com.

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.

CIRCULATION: Circulation is controlled at 73,000 copies per month.

ABC AUDIT APPLIED FOR.

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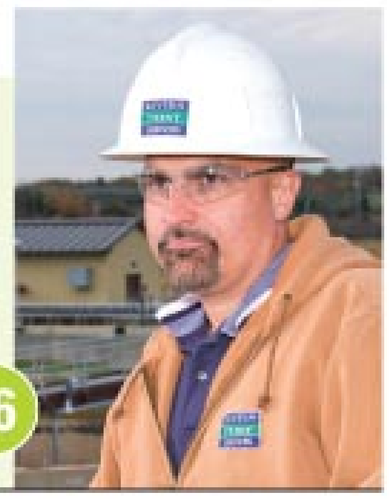
on the cover

As project manager at the Howard H. Seymour Water Reclamation Facility in Lewes, Del., Walt Baumer skillfully leads a three-person staff. His efforts have earned him recognition from the Delaware House of Representatives as 2008 Wastewater Operator of the Year. (Photo by Karl Richeson Photography)



Back From the Dead

HERE ARE TWO CASES WHERE WASTEWATER TREATMENT HAS MADE A REMARKABLE DIFFERENCE IN A WATERWAY. THE MIRACLE IS REPEATED ALL ACROSS THE COUNTRY.

By Ted J. Rulseh, Editor

In October we asked readers to share stories of how their treatment plants have improved their receiving streams. First to respond were Pete Baranyai of the East Chicago (Ind.) Sanitary District and Patty Troy of the City of Port Huron (Mich.) Water Reclamation Facility.

Their stories are inspiring. Baranyai's already seems to have a happy ending, while Troy's remains a work in progress.

SAVING THE ST. CLAIR

"I was blessed to grow up next to the St. Clair River," wrote Troy, lab manager at Port Huron. "As a kid, I swam every day in the summer. My grandparents' home was on the river, and I liked to jump in from a pipe that extended into the river from their backyard. We would jump in with inner tubes and float downriver for a mile or two. Many years, later I learned that pipe was a CSO outfall.

"The St. Clair has its share of problems. In 1986, it was named an Area of Concern by the International Joint Commission. Problems include a legacy of heavy industry, particularly in the Chemical Valley on the Ontario shore.

"I have served on the Binational Public Advisory Council for the St. Clair since 1992. We have seen great improvements since, some related to wastewater treatment. While the Port Huron facility has had secondary treatment since 1975, the Sarnia Wastewater Treatment Plant directly across the river (8.5-mgd average flow) had only primary treatment.

"In 2001, Sarnia completed a $30 million upgrade to secondary treatment. On both sides of the river, CSO separations have occurred and are continuing. The St. Clair is a major sturgeon spawning area and home to 91 species of fish. It has the largest freshwater delta in North America, and immediately downstream is Lake St. Clair which is also a major fishery."

The St. Clair is the target of a Remedial Action Plan that aims to restore the ecosystem. Groups involved include Friends of the St. Clair River and Friends of the St. Clair River watershed.

SUDDENLY SALMON

Baranyai's story borders on miraculous: Chinook salmon spawning in his treatment plant's disinfection contact chamber. The roots of the miracle go back to the late 1980s, when the plant completed a $19 million upgrade and switched from chlorine to UV disinfection.

After that, the plant's effluent stream changed from murky beige to crystal clear. And in October 1989, while leading a group of children on a tour, Baranyai saw a 30-inch fish in the effluent channel. It turned out to be a salmon.

The fish have to run an obstacle course to get to the treatment plant: From Lake Michigan, up a shipping channel that cuts through a steel mill and an oil refinery, up the Grand Calumet River, through the plant's shallow, 700-foot-long effluent stream, then up a 200-foot-long effluent pipe that discharges more than 15 mgd. Then they have to jump a 4-foot waterfall to get into the contact chamber.

Biologists inspecting the contact chamber have found masses of freshwater sponges, dense enough to resemble a coral reef. Around them swam clouds of chinook salmon fingerlings — proof positive that the salmon are spawning in the plant.

What's happening downstream in the Grand Calumet River is just as encouraging. Ecosystem surveys have found healthy populations of native fish, including white sucker, smallmouth bass, pumpkinseed, rock bass, and river redhorse, a state-threatened fish that needs clear, clean water to survive and reproduce.

The lands along the river have come alive, too. Deer, beavers, coyotes and foxes, thrive there, along with more than 90 species of birds, including ducks, swans, geese, kingfishers, blue heron and white egrets.

"This ecosystem was unimaginable when I was a kid," Baranyai told *Chicago Wilderness Magazine*. "To me, it means that the Clean Air and Water Acts have brought government, industry, and environmentalists together in a way that is really beginning to show some results. It's great that our plant is a part of that."

Spawning chinook salmon have regularly visited the East Chicago Sanitary District treatment plant since a major upgrade in the late 1980s.

WHAT'S YOUR MIRACLE?

Anyone who makes clean water for a living has to love stories like those. What's happening downstream from your treatment plant? Tell us how your plant is protecting and improving your receiving stream. Just send a note to editor@tpomag.com and we'll share your story with readers of *Treatment Plant Operator*. tpo

Patty Troy sees major improvements in the St. Clair River, in part because of wastewater treatment.

> "This ecosystem was unimaginable when I was a kid. To me, it means that the Clean Air and Water Acts have brought government, industry, and environmentalists together in a way that is really beginning to show some results. It's great that our plant is a part of that."
>
> **PETE BARANYAI**

letters

More on nutrient removal

To the editor:

I have enjoyed receiving *TPO* magazine this past year, and I have signed up for another subscription. One of our biggest challenges is bio-nutrient removal.

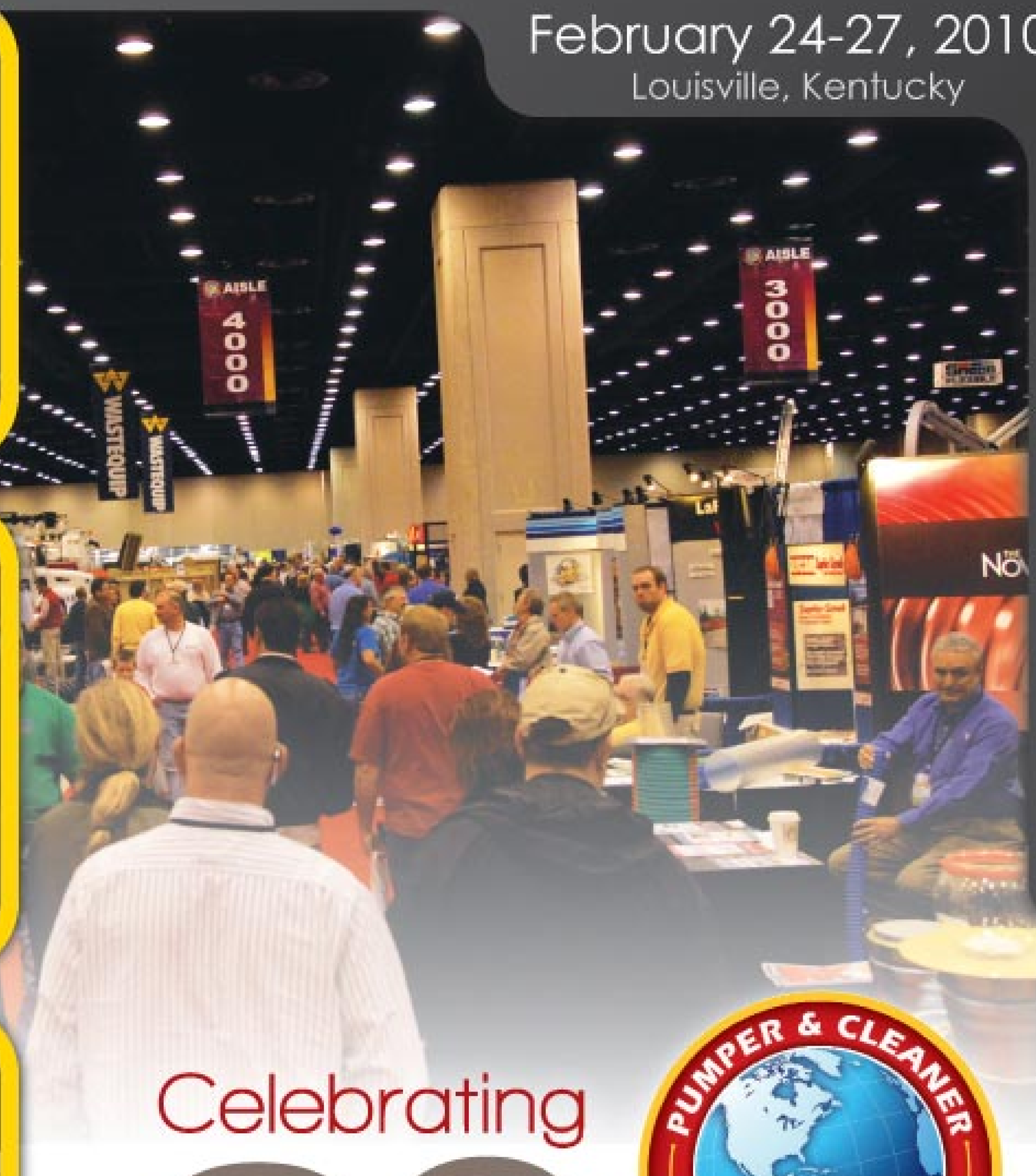
The present permit requires monitoring of nitrates, nitrites, TKN and phosphorus. We are attempting to keep our annual average of total nitrogen under 8 mg/l and phosphorus under 1.5 mg/l. I was looking forward to having five years to experiment with methods to meet these targets, but we were robbed of over one year because of an epic flood that functionally destroyed our facility.

From July 2007 to September 2008 we limped along using lagoons and temporarily rigged basin aeration for process treatment. After the rebuilt plant went back online in September 2008, we began to regroup and get a handle on our nitrogen and phosphorus levels. If you could include articles on what plants are doing to control these bio-nutrients, especially with equipment already on hand, that would be helpful.

I noticed in the December issue editorial that some readers have expressed a desire for more articles on industrial treatment. That would be fine as long as you don't shift the focus away from the municipal plants. It seems I read many more articles in other trade journals covering the industrial side, but very few except for this magazine focus on municipal plants.

Keep up what you are doing.

Kenney Farmer
Chief Operator,
Independence (Kan.) WWTP



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Open Invitation

IN DELHI CHARTER TOWNSHIP, THE COMMUNITY CELEBRATES WATER QUALITY AND ENVIRONMENTAL STEWARDSHIP AT AN ANNUAL TREATMENT PLANT OPEN HOUSE

By Diane Gow McDilda

The Delhi Charter Township Wastewater Treatment Plant has an open invitation to all. For the past nine years, the plant has held an Open House and Re-Use Rally in May to coincide with Water Quality Awareness Week.

"It's a way to bring the community in to see a place they don't typically see," says Allen Bryant, environmental coordinator at the plant, in Holt, south of Lansing. "We want them to see that we're a part of the community and what their sewer bills pay for."

The event is free, including hotdogs, hamburgers, and snow cones, and is open to anyone. While it's geared toward elementary school children, older kids and adults learn things, too.

INFLUENT TO EFFLUENT

Plant tours begin every 30 minutes. A large green tractor pulls a hay wagon load of visitors across the grounds. An employee, usually Sandra Diorka, plant superintendent and director of public services, leads the expedition.

Over a megaphone, she describes the physical, biological, and chemical processes in the tertiary treatment plant. While visitors can't see the plant discharge, they learn that the effluent flows to the Grand River and eventually to Lake Michigan.

PHOTOS COURTESY OF DELHI CHARTER TOWNSHIP

Members of the Holt Community Arts Council help build Gill, the mascot for the Delhi Charter Township recycling center, as part of the Re-Use Rally held at the township wastewater treatment plant.

"It's a way to bring the community in to see a place they don't typically see. We want them to see that we're a part of the community and what their sewer bills pay for."

ALLEN BRYANT

Visitors have time to step off the wagon and take a closer look at the processes. They are also encouraged to visit a treatment system demonstration when they finish the tour. The demonstration, presented by a plant operator, includes a plant schematic along with samples from each step of the treatment process. A microscope lets visitors see the microorganisms they learned about on the tour.

Plant tours are available year round, but one day a year it's part of a celebration. Videos from last year's tour and demonstrations are posted on the township's Web site and on social networking sites like Facebook.

Flyers advertising the event are sent with utility bills, posters are put up in town, press releases are sent, and plant personnel do interviews on TV and radio. It works: The highest turnout was 800 in 2008.

ACTIVITIES ABOUND

The treatment plant shares 60 acres with other municipal facilities including the recycling center. Plant employees and volunteers staff booths and referee activities that include face painting, creating edible aquifers, and competing in pet waste pick-up, where contestants with buckets and pooper scoopers race to pick up phony droppings.

As children make their way through the games, they can answer educational water-quality questions. Every correct answer earns them a sticker, and those stickers add up to something: a chance to release a fish into the Grand River.

"It depends on what's available," says Bryant. "We have different ones every year, and we have to get permission from the Department of Environmental Quality. It could be channel catfish, bluegills, or bass."

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.**

The Re-Use Rally, more like a large swap meet, is an exciting part of the day. Tents and tables are set up, and people bring unwanted items, from clothes to electronics. "It's a big draw," says Bryant. "A lot of people come to see what's being given away."

In 2008, Gill, the recycle center mascot, was created at the Re-Use Rally. Local children were asked to donate used liquid detergent bottles. Some 2,500 of them were attached to a cut-out section of fence mounted on wheels. Gill, made up of bright reds, blues, yellows, and greens, stands 15 feet high and is 25 feet long.

The annual Re-Use Rally includes a wide array of activities for children and all ages.

"Already, he's done three parades and has been to the local farmer's market," Bryant says. "We'll get calls from people asking if Gill can come sit in their parking lot." Gill was at the 2009 open house along with other plywood fish decorated by area school children. He serves as a good reminder on the importance of protecting water quality. tpo

In It *Together*

THE KANAPAHA WATER RECLAMATION FACILITY HAS A TEAM OF PROFESSIONALS WHO MANAGE BIOSOLIDS AND EDUCATE THE PUBLIC — IN AND OUT OF SCHOOL

By Diane Gow McDilda

profile

Kanapaha Water Reclamation Facility, Gainesville, Fla.

BUILT:	1977
FLOWS:	14.9-mgd design, 12-mgd average, 21.2-mgd peak
TREATMENT LEVEL:	Advanced tertiary
TREATMENT PROCESS:	Activated sludge, sand filtration
RECEIVING WATER:	Floridan aquifer and reuse
BIOSOLIDS PROCESS:	Aerobic digestion, gravity thickening
BIOSOLIDS VOLUME:	3,300 dry tons/year
BIOSOLIDS USE:	Land application (Class B)
OPERATORS:	Class A: James Hope, Tom Mikell, Richard Smith, Robert Snider, Gary Steele, Gene White. Class B: Dusty Griffis, Syed Hasan, Robert Tyler, Mike Flanigan, Bruce Gandy. Class C: George Mitchell, Donnie Eplee, Kevin Willis. Trainees: Ray Garone, Edwin Parsons, John Hawkins
WEB SITE:	www.gru.com

OPPOSITE PAGE: Members of the team at Kanapaha: from top to bottom, Ivan Wallace, instrument control and electrical technician; Mike Flanigan, senior lab technician; Syed Hasan, operator II; Wayne Dukes, mechanic II; Dusty Griffis, operator II; Jenelle Chraft, senior lab technician; James Hope, director; Luther Belyew, O&M manager; John Bacom, maintenance supervisor; Sandy Barnes, lab supervisor; Steve Bossons, mechanic III; John Bradley, mechanic III; Jamie Hill, staff specialist; Willie Baker, mechanic I; Tom Mikell, operations supervisor; and Andy Hall, mechanic II. (Photography by Ed Galoustian)

The Kanapaha Water Reclamation Facility is an innovative facility with an exemplary biosolids program.

THE CITY OF GAINESVILLE IS HOME TO THE University of Florida and the Florida Gators — and to an innovative water reclamation facility with an exemplary biosolids program.

The Kanapaha Water Reclamation Facility (WRF), owned by Gainesville Regional Utilities, is tucked away in the southeast corner of the city, where a landscape of student apartments merges with single-family homes. Further east, the city gives way to farmland.

Just 12 miles down the road from the Kanapaha facility, Class B biosolids are transported by tanker trucks for land application at the Whistling Pines Ranch where they supplement inorganic fertilizer. Biosolids from GRU's Main Street Wastewater Treatment Plant are also land-applied there.

"Recycling biosolids is a sustainable, environmentally beneficial practice that improves and maintains productive soils and also reduces chemical fertilizer use," says Paul Davis, utility engineer. Team effort is inherent throughout GRU. Biosolids from more rural neighboring towns, like Hawthorne, Waldo, and High Springs, are managed through the GRU plants.

"Recycling biosolids is a sustainable environmentally beneficial practice that improves and maintains productive soils and also reduces chemical fertilizer use."

PAUL DAVIS

"We take their waste activated sludge," says James (Jamie) Hope, director of water reclamation facilities and lift stations. "It's at 1 to 1.5 percent solids, and they have no way of thickening it. We charge them, but only to cover costs."

Hope says the state Department of Environmental Protection (DEP), appreciates the practice because of the help GRU provides for the smaller communities who may not otherwise be able to recycle their biosolids. GRU also partners with the university and accepts thickened solids from an on-campus treatment plant.

TREAT AND SEPARATE AND TREAT AGAIN

Wastewater entering the Kanapaha WRF is treated with an activated sludge process. Secondary effluent is run through a sand filter and disinfected with chlorine. Effluent is either pumped to four 1,000-foot-deep Floridan aquifer injection wells, or to 1,000 reuse customers who use it for irrigation. The water is treated to primary and secondary drinking water standards.

Reuse water goes to nearby neighborhoods, commercial properties, parks, aesthetic water features, infiltrating wetlands, and a golf course.

Because only 31 percent of the effluent is now reclaimed, the facility is always on the lookout for new customers. New developments are usually connected to the reuse system, but as the building market has slowed, so has the acquisition of new customers.

At Kanapaha, solids from the secondary clarifier that are not returned to the aeration basin are pumped to three aerobic digesters that operate in series. The first and second are sized at 0.66 and 0.64 million gallons and use coarse-bubble diffused aeration. The third digester (0.64 million gallons) uses a floating mechanical surface aeration system. The Main Street plant

Mike Flanigan, senior lab technician, performs total solids testing.

ABOVE: Gary Steele, operator III, checks on the facility's Andritz gravity belt thickener. LEFT: Jenelle Chraft, senior lab technician, titrates samples.

"Since the land application program is agricultural in nature and the city is making a long-term investment at the site, GRU's land application program preserves Alachua County rural areas, farming and crop production, and supports future agricultural uses at and near the application site."
PAUL DAVIS

incorporates two 1.29-million-gallon digesters that use both coarse-bubble and surface-mechanical aeration systems.

Biosolids are thickened using two Ashbrook and two Andritz gravity belt thickeners, each two meters wide. Only one gravity belt thickener is used at a time, leaving the others available for maintenance and cleaning. Just before the thickeners are mixing chambers where ClariFloc polyacrylamide emulsion polymer (SNF/Polydyne) is added.

IN-HOUSE TRUCKING

From the thickeners, biosolids are stored in below-grade tanks until a truck pulls in for loading. Coming out of the digesters, the solids content ranges between 1.2 to 1.5 percent. After thickening, the goal is to produce a product with no more than 5 percent solids. Anything thicker would be difficult to pump into and out of the tanker trucks.

GRU owns the tanker trucks — two 6,000-gallon and two 4,000-gallon units. It takes about 30 minutes to load the tank at the plant, and about two hours total for trucks to travel to the application site and back. Three to four truckloads of biosolids are delivered from the Main Street plant daily, and five to six loads from the Kanapaha facility. At the farm they're pumped into a storage tank. GRU pays for an employee at the farm to manage the application process.

"It's beautiful," says Davis. "For more than 25 years we've been doing it. We're lucky in Gainesville that we can go right out of town. Since the land application program is agricultural in nature and the city is making a long-term investment at the site, GRU's land application program preserves Alachua County rural areas, farming and crop production, and supports future agricultural uses at and near the application site."

At the ranch, biosolids are spread using a GEA Houle spreader system. They are either injected 6 inches below the surface or surface-applied with a distributor. If they are surface-applied, the solids are disked into the soil. Kanapaha's biosolids professionals believe they have a high-quality product that economically is a perfect fit. So, for the time being, there are no plans to raise the biosolids grade from Class B to Class A.

"We have to account for paying customers when considering costs to treat the biosolids," says Davis. "The program is the most cost-effective and environmentally sustainable method of providing wastewater treatment services to GRU's customers, and it saves local communities from having to finance and manage their own biosolids programs."

SUMMER VACATION

Operating in a college town, the Kanapaha Water Reclamation Facility sees changes during the summer, when the students mostly go home.

With a University of Florida student population of 50,000 and a resident population ranging of 125,904 in the City of Gainesville and 256,232 countywide, the effect of summer vacation is noticeable. Flows can drop by up to 1.5 to 2 mgd between May and July.

Meanwhile, truck drivers hauling biosolids from the Kanapaha plant benefit from lighter traffic. They still have to negotiate past businesses and shopping centers, but with public schools closed and university students gone, it's much less challenging.

During heavier-traffic months, it's tempting for the Kanapaha staff to avoid the crowds and opt for night deliveries, but still there are obstacles. "We did deliver at night, but naysayers claimed we were trying to hide something," Hope says. "Because of the traffic and growth, we may just have to go back to night deliveries."

ABOVE: The GEA Houle spreader used in the plant's land application program.
LEFT: Dusty Griffis, operator II (left) and James Hope, director of water reclamation facilities and lift stations.

Kanapaha Water Reclamation Facility
EFFLUENT PERMIT REQUIREMENTS

PARAMETER	PERMIT
BOD_5	10.0 mg/l annual and monthly avg. 15.0 mg/l weekly avg. 20.0 mg/l single sample max.
Turbidity	3.0 mg/l single sample max.
Total Nitrogen	10.0 mg/l annual, monthly, and weekly avg. and single sample max.
Nitrite plus Nitrate	10.0 mg/l annual, monthly, and weekly avg. and single sample max.
TSS	5.0 mg/l single sample
DO	5.0 mg/l single sample
Ammonia, unionized	0.02 mg/l single sample
Total Phosphorus	1 mg/l monthly avg.
pH	6.0 - 8.5

OPERATOR AS TEACHER

Beyond concern for protecting the public, Hope and others at the plant believe education is a key component of their jobs. "We are very engaged in the community," says Hope. "We do approximately 50 tours a year, from college-age students to home-schoolers."

Public utility professionals from all over the world, visit the plant. Visitors tour the treatment plant and can also explore the adjacent Chapman's Pond and nature trails. The land spans 66 acres and includes 1.8 miles of trails open for public use. Ponds, streams, waterfalls and fountains in the park are all supplied by reclaimed water and include educational signage. Chapman's Pond has a berm and barrier-free access so that everyone can see the nests and bird boxes along the perimeter. A kiosk provides bird identification.

GRU also constructed a series of man-made wetlands at nearby Kanapaha Middle School. It serves as a living laboratory for students as they observe the ecosystem provided by the reclaimed water. Educating students goes beyond the mechanisms of treatment plant operation and biodiversity to potential careers. That grows more important as treatment plant operators approach retirement with no replacements in sight.

"In Florida, the average age of wastewater treatment plant operators is 52 years old," says Hope. "We go to career day for recruitment." With all the effort put into plant tours, education and community outreach, it's no surprise that people gain a new understanding for wastewater treatment and biosolids management. Many are outright won over.

"I have given hundreds of tours," says Hope. "Afterward, people have much more of an appreciation for what we do. They become our advocates and allies." And you can never have too many of those. **tpo**

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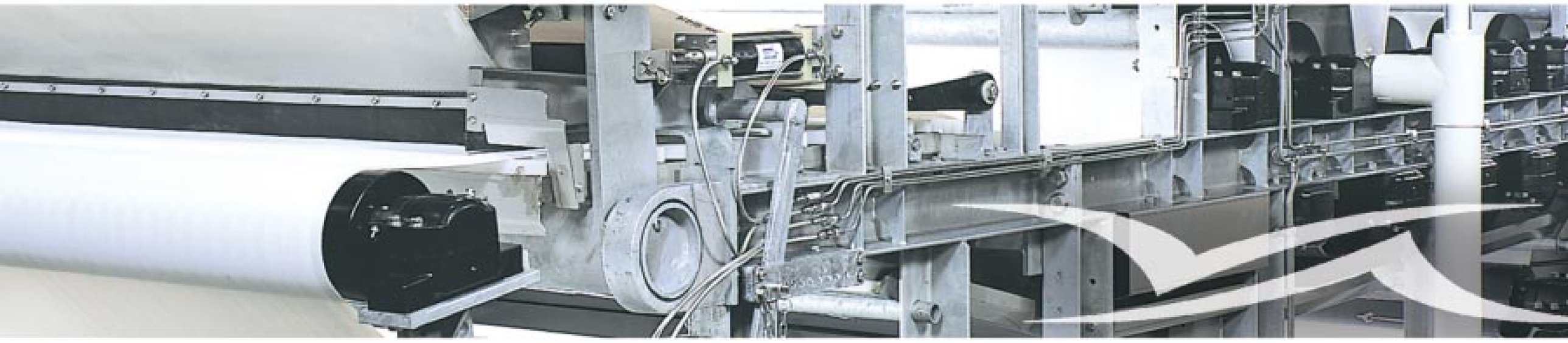

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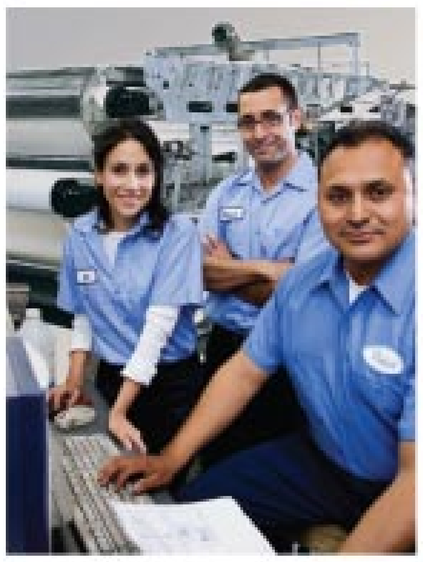

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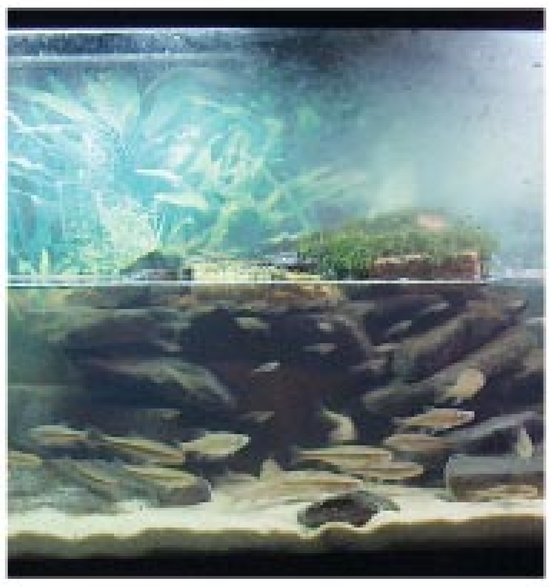
AN AQUARIUM IN THE LAB AND PONDS ON THE PROPERTY HELP A WASTEWATER TREATMENT PLANT MONITOR EFFLUENT AND CONVEY A POSITIVE PUBLIC IMAGE



Plants and aquatic life thrive in effluent from the North East Wastewater Treatment Plant in Conover, N.C.

By Mary Shafer

To gauge the health of their treatment plant, Mike Fox and his staff just have to check with their fish.

The North East Wastewater Treatment Plant in Conover, N.C., has an aquarium in its laboratory and two ponds on the grounds outside, both fed with plant effluent and stocked with fish and other aquatic creatures. Besides giving the staff a "miner's canary" assessment of effluent quality, these features help show the public that the plant is protecting life in local waterways.

MONITORING QUALITY

The original plant went online in 1991, serving Conover's population of 8,016, spread over 10.2 square miles. Situated on 35.7 acres along Lyle Creek and three tributaries draining the Appalachian foothills, the plant processes about 0.75 mgd on average.

The 55-gallon aquarium receives a continuous flow of plant effluent. It is fed by tapping an effluent sampler line. The average flow rate allows about three minutes of detention time.

Fox, supervisor of wastewater treatment, got the idea from a trade magazine as an interesting way to monitor effluent quality. "My background was in marine studies, so I was interested in fish anyway," he says. "When I saw that flow into the lab, it seemed obvious we could tap into it for the aquarium."

The idea was that plant staff would know immediately from the fishes' behavior if effluent was carrying an overload of residual chlorine or was deficient in some other way. "Well before it reaches a level that would be detrimental to the receiving stream, the fish will let us know," says Fox.

"It's probably the most valuable operational tool we have. We can walk by it any time of day and immediately see any escaping solids, unusual color, or turbidity. We weren't sure when we put it in how it was going to play out or how valuable it would be. But now I could hardly operate a plant without it. It would seem like flying blind."

The aquarium fish are all native species. Chubs, pumpkinseeds and darters are more hardy, while dace are fragile. Accustomed to high-dissolved oxygen from their native swift-water environments, dace are good environmental quality indicators. The tank also holds crayfish, frogs and salamanders.

INSTALLING PONDS

The old aeration basin was changed over to a pond in 1997 when the plant was updated with a sequencing batch reactor facility. A new clarifier was also added, creating two ponds. The effluent sampler and aquarium discharge about 20 gpm into the ponds.

A University of North Carolina satellite school in nearby Asheville offers a Ph.D. program in marine biology. Fox thought Conover might get the program interested in researching the fish that live in 100 percent effluent. "The aquarium is more of an acute look, while the basin ponds allow for a more chronic, long-term view," Fox says.

From time to time, the aquarium fish would get a fungus-like growth that would rot their tails and cause lesions. Fox took samples to the university, where analysis revealed *Columnaris,* a bacteria that attacks fish that are injured or highly stressed.

The Conover lab staff noted the aquarium's large fish were attacking the smaller ones, causing wounds that hosted the bacteria. They changed the size mix so that most fish are now of similar size, with no predators. They moved the larger fish to the ponds.

Pond species are not all native. "At first, I just got 50 goldfish," recalls Fox. "Over a few months, they got huge and beautiful." Once they grew to 6- to 8-inches in size, he took them back to the fish store and traded them for koi, which have been joined by channel catfish and bullheads.

REACHING OUT

That's where outreach involving the ponds began. The Conover Police Department began staging its annual street fair in conjunction with the plant as part of public outreach to show off the SBR facility.

Private lawn ponds were becoming popular among residents, so Fox and his staff began giving fish from the ponds to the public as starters. This sent the message that plant effluent was clean enough to sustain sensitive life and generated public goodwill.

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.

Fox's crew grows water hyacinths that cover three-quarters of the ponds, helping keep the water clear and algae-free. "When it blooms, it's incredible, with purple flowers all over the top," says Fox. Public tour groups, including Boy Scout troops, summer campers, college students, state officials and foreign visitors can witness the pond's beauty and see the fish.

"The aquarium is probably the most valuable operational tool we have. We can walk by it any time of day and immediately see any escaping solids, unusual color, or turbidity. We weren't sure when we put it in how it was going to play out or how valuable it would be. But now I could hardly operate a plant without it. It would seem like flying blind."

MIKE FOX

The whole aquarium and pond setup cost just a few hundred dollars, funded from the operations and maintenance budget. No outside contractors were required. The only maintenance consists of regular cleaning. "With healthy water, you're going to have things growing, so it's a never-ending battle to keep algae out," says Fox. "But it's not a hard thing to do."

Local newspapers have written about the project, and a Charlotte TV station featured the ponds and aquarium on its six o'clock news. "I like to think it helps a little to counter some of the bad press that makes it look like government doesn't care or isn't doing a good job," Fox says.

"Acts of nature happen, and response may not always be what people expect. But with what we're doing, people are seeing that we do try, that we do care, and that we're quietly working every day to keep their water safe and clean." **tpo**

top performer: **AGENCY**

Facility superintendent Karen Wallace surveys the upset lagoon at the Summerhouse Water Reclamation Facility, which provides for the agency while reducing demand on potable water supplies. (Photography by Erica Conner)

Toward the *Center*

A REGIONAL WASTEWATER MANAGEMENT PLAN INCLUDING WATER REUSE WILL BENEFIT PLANT OPERATORS AND RESIDENTS IN ONSLOW COUNTY, N.C., WHILE PROTECTING THE ENVIRONMENT

By Trude Witham

FACED WITH POPULATION GROWTH, LIMITED infrastructure, decreasing water supplies and environmentally sensitive coastal waters, Onslow County, N.C., is taking a centralized approach to wastewater management in the Stump Sound service area.

The Onslow Water & Sewer Authority (ONWASA) is acquiring existing localized facilities and acreage, developing a regional reclaimed water facility, and enhancing current facilities.

The approach will ultimately make life easier for ONWASA operators by eliminating the need for new on-site package treatment plants to serve individual developments. It will also improve effluent quality from existing plants.

> "A regional wastewater approach will improve water quality by allowing ONWASA to manage wastewater and reclaimed water resources."
>
> **FRANK SANDERS**

A water reclamation system scheduled for start-up this year will treat wastewater from the Holly Ridge community and future developments. More improvements will be made in the next few years, with the ultimate goal of creating a regional wastewater treatment solution.

"A regional wastewater approach will improve water quality by allowing ONWASA to manage wastewater and reclaimed water resources," says Frank Sanders, engineering director. "Even more important, it will stop the proliferation of individual on-site wastewater treatment plants, owned and maintained by homeowner associations, contract operators or private utilities, at every new coastal development."

While Sanders and the operations staff look forward to the program's completion, their biggest hurdle is finding ways to fund the various projects. "We're waiting to hear whether we will get federal stimulus package funding for one project," he says. "Another project was cancelled because the Clean Water Management Trust Fund money was frozen. So, it's a challenge."

FRAGMENTED SYSTEMS

The Stump Sound service area includes three small communities: North Topsail Beach, Holly Ridge and Sneads Ferry. The service area is divided further into four management zones.

Sneads Ferry is served mainly by septic systems. Because there is no centralized sewer service, new waterfront developments rely on on-site treatment plants.

The Central Management Zone, between Marine Corps Base Camp Lejeune and the Intracoastal Waterway, has little wastewater

Top to bottom, Dale Richmond, Allen Rhue and Dean Duenow, operators at the Summerhouse WRF.

profile

Onslow Water & Sewer Authority (ONWASA), Jacksonville, N.C.

FOUNDED:
2000

CUSTOMERS:
80,000

AREA SERVED:
754 square miles

EMPLOYEES:
125 (full-time)

TREATMENT PLANTS:
8

RECEIVING WATER:
Local streams and creeks ultimately discharging to New River

BIOSOLIDS:
Land-applied

WEB SITE:
www.onwasa.com

ONWASA Existing Wastewater Treatment Plants (Listed oldest to newest)

PLANT	BUILT	CUST. POP. SERVED	TREATMENT LEVEL	PROCESS	DESIGN FLOW	AVERAGE FLOW	LAST UPGRADE
Richlands	1964	700	Tertiary	Oxid. ditch	250,000 gpd	140,000 gpd	1993
Swansboro	1974	1,500	Reuse qual.	Oxid. ditch	600,000 gpd	275,000 gpd	2008
Holly Ridge	1975	600	Secondary	Aer. lagoon	241,000 gpd	105,000 gpd	None
Kenwood	1980	180	Tertiary	Act. sludge	49,000 gpd	400,000 gpd	None
Hunters Creek	1980	1,000	Tertiary	Act. sludge	250,000 gpd	170,000 gpd	None
Springdale Acres	1985	300	Tertiary	Act. sludge	75,000 gpd	50,000 gpd	None
Hickory Grove	1987	130	Secondary	Fac. lagoon	25,000 gpd	12,000 gpd	None
Summerhouse WRF*	2008	2,500	Reuse qual.	MBR	400,000 gpd	–	None

* Not yet online

infrastructure and is served by septic systems. A projected increase in troops at Camp Lejeune has led to proposals for new housing developments with privately owned sewer systems.

The Western Management Zone includes the Town of Holly Ridge, whose treatment facility consists of an aerated lagoon and disinfected secondary effluent, land-applied to an ONWASA-owned spray field. This zone also includes a large subdivision with a new sewage collection system built by developers. Five more large developments are planned, each possibly with its own treatment plant.

North Topsail Beach is served mainly by a private utility, but ONWASA serves about 10 percent of the community.

SHORT-TERM ANSWER

While it would be ideal to construct a regional wastewater system that serves the entire county, that would take too long and frustrate developers who need to proceed with planning, design and permitting for their projects.

The short-term solution is a reclaimed water system that provides highly treated effluent for beneficial reuse. In February 2009, ONWASA purchased the 0.4-mgd Summerhouse Water Reclamation Facility (WRF). Built in August 2008 by the developer of a new 1,040-lot subdivision, the Summerhouse plant consists of a central-

basins, and the high-quality reclaimed water will be used for irrigation and other non-potable uses. The reclamation facility will replace an aerated lagoon and eliminate pumping of that water three miles for spraying on an 88-acre field.

"We're waiting for stimulus money for a new lift station and a raw sewage force main to convey wastewater from Holly Ridge to the new Summerhouse facility," says Sanders. "A reclaimed water line will convey highly treated wastewater to future developments that can use the water for irrigating lawns and golf courses.

"We will decommission the aerated lagoon and remove, dewater and land-apply the residual biosolids. Developers can tie into the new plant rather than build individual treatment plants. It's a win-win situation."

The Summerhouse WRF will bring greatly needed wastewater treatment capacity to the area and help reduce demand on the potable water supply. It is just phase one of nine project phases to be implemented over the next few years as part of ONWASA's wastewater management master plan. If all goes well, the plan will culminate in the new regional 0.5-mgd Northwest Water Reclamation Facility that will serve the northwest area of Onslow County.

In 2008, ONWASA purchased 1,000 acres for this plant, which will include a dual-train, dual-barrier design concept, a five-day

"On-site plants don't have to go through public hearings, whereas larger, publicly-owned plants have to go through a greater permitting process. So, it takes us longer to get our plants up and running than it does for developers."

FRANK SANDERS

ized sewage collection system, membrane bioreactor (MBR) treatment facility, and dual rapid-infiltration basins. Equipment includes:

- An equalization basin with fine screenings conveyor, Discfuser (a division of Siemens Water Technologies) coarse-bubble aeration, WILO-USA submersible mixers, Fontaine sluice gates, Gardner Denver Sutorbilt blowers, and electric flow valves.
- A Siemens package MBR system with Memcor (a division of Siemens Water Technologies) hollow fiber membranes, Envirex (a division of Siemens Water Technologies) coarse-bubble aeration system and Dontech drum screen.
- An Aquionics UV disinfection system.
- A digester with Discfuser coarse-bubble aeration, WILO-USA mixers, Gardner Denver Sutorbilt blowers, Penn Valley Pump sludge transfer pumps, and Vapex odor control.
- LMI Milton Roy chemical feeders.

When the new developments' homes are connected to the Summerhouse facility, the MBR-treated water will go to infiltration

lined upset basin, influent equalization, chemically assisted biological nutrient removal, membrane filtration for reliable liquid-solid injection, UV disinfection and sodium hypochlorite injection, odor control and SCADA. Plant construction is scheduled to begin in January 2011, depending on funding. When completed, it will operate in parallel with the Summerhouse WRF to provide the ONWASA service area with 1.0 mgd of treatment capacity.

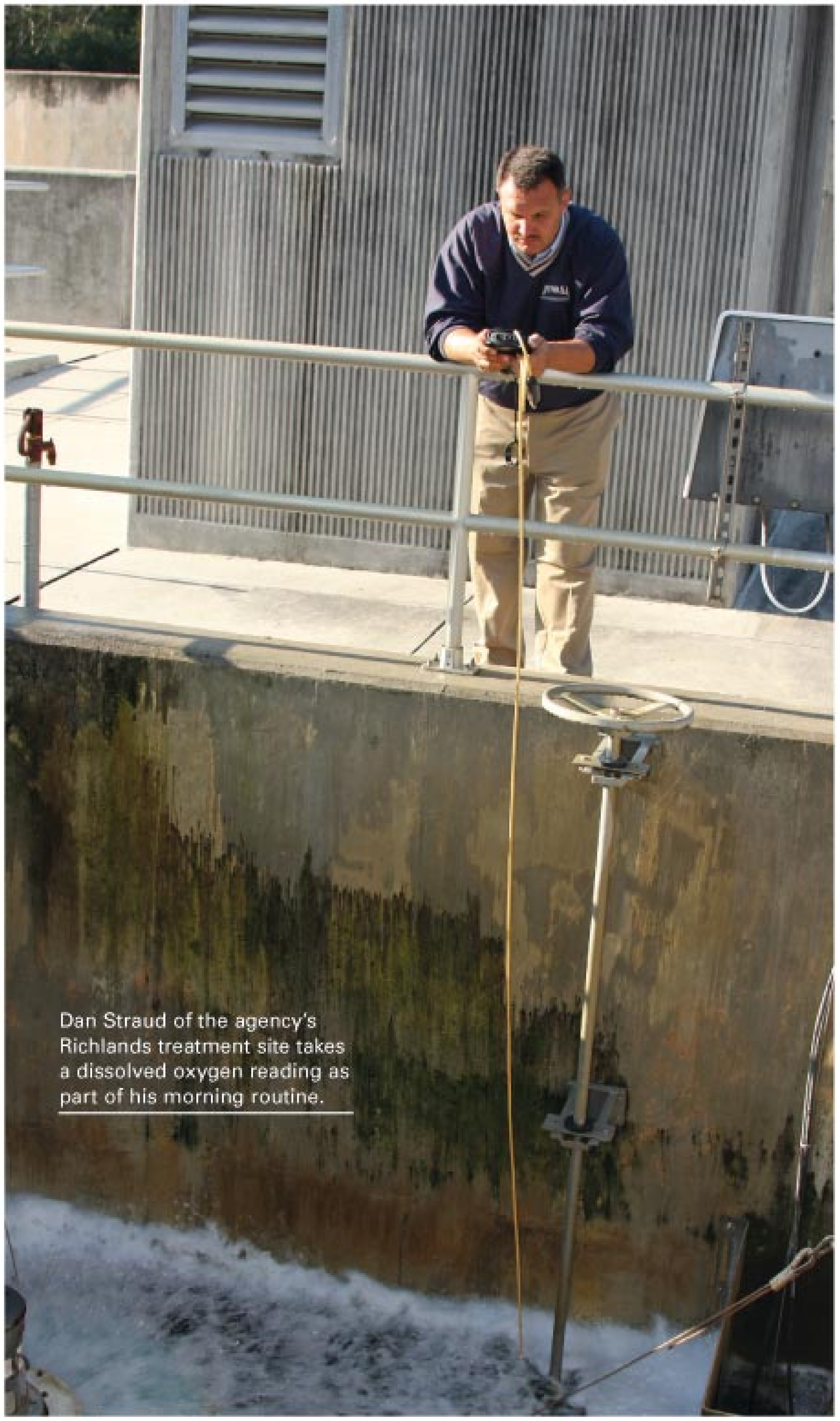
IMPACT ON OPERATORS

"The impact will be huge, when you consider that the small on-site treatment plants do not always meet discharge specifications," says Sanders. "The 28 package plants that are already operating will stay, and we are gradually taking them over and operating them. But, there will be no new ones once the developments can tie into our wastewater reclamation plants."

The current economic climate and tight credit market has slowed down some of the developers' projects, giving ONWASA time to implement the water management project before new on-

Allen Rhue checks the Turbidometer (Hach) in the main control room for the Summerhouse facility.

Dale Richmond checks the influent screen at Summerhouse for proper function.



Dan Straud of the agency's Richlands treatment site takes a dissolved oxygen reading as part of his morning routine.

site plants are built. "On-site plants don't have to go through public hearings, whereas larger, publicly-owned plants have to go through a greater permitting process," says Sanders. "So, it takes us longer to get our plants up and running than it does for developers."

Finding enough operators to cover the plants ONWASA is taking over is a challenge, as is keeping operators up to speed on technology upgrades.

"There never seem to be enough operators," says Sanders. "With limited budgets, trying to get operators up on the new technologies is always a problem. We can accomplish this by including operators in on the project design and including sufficient training in the project budget so training can occur before the plant starts, not after."

Operators have been struggling to meet discharge specifications from private on-site treatment plants. "Some of the plants are old, and the upkeep has not been that good," says Jimmy Powell, ONWASA field operations director. "We have to spend quite a bit of money to get them to meet effluent quality. Sometimes the data collected by previous operators is way off compared to the data we collect."

Sanders agrees: "Some of these plants were put together piecemeal, and it's a real challenge for our operators to meet the requirements. Their collection systems are old, and if the infiltration and inflow gets too high, the sand filters have to be replaced."

Sanders and Powell believe that working closely with the State's Division of Water Quality is key to dealing with those issues. "We talk to the state and ask them to tour the plant so they can see the condition it's in," says Sanders. "The state tends to visit municipal plants more than private systems. The walk-through is useful so that if problems occur later, everyone is on the same page."

In spite of the challenges, Sanders says ONWASA's 10 treatment plant operators are optimistic about the future. "Our operators at Holly Ridge are overseeing an aerated lagoon, but once the membrane plant is running, they will go from an antiquated

"Our operators at Holly Ridge are overseeing an aerated lagoon, but once the membrane plant is running, they will go from an antiquated system to a very good system that will produce much better quality water."

FRANK SANDERS

system to a very good system that will produce much better quality water," he says.

Surprisingly, operator turnover at ONWASA has been nonexistent. "The operators care about what they're doing and about the environment," says Powell. "I am really proud of them, and I couldn't ask for better operators and the knowledge they have, regardless of the treatment process."

CHALLENGE OF GROWTH

In June 2009, Powell was promoted from deputy operations director to his current position, where he is in charge of water treatment plant operations, wastewater collection crews, SCADA, maintenance and laboratory. He supervises 70 employees and expects to hire more lab personnel. "We now do 50 to 60 percent of our water and wastewater sampling and testing, but we will be hiring more chemists so we can do the majority of the testing," he says.

The treatment plant superintendent's position is in the capable hands of Karen Wallace. With 13 years in the municipal water treatment business in Onslow County, she is no stranger to water management challenges.

"I started as an operator and worked my way up," she says. "I had been working at a recycling facility that had its own spray field, so I took it over and became certified. I liked the hands-on aspect of the job where operators did pretty much everything. It wasn't as specialized as it is now."

Her day typically starts at 7 a.m., when she gets caught up on paperwork, completing reports, signing requisitions for new equipment, repairs and parts, and dealing with warranty issues. She oversees seven supervisors who in turn are in charge of one to six operators.

Wallace's biggest challenge is learning about the wastewater side of the business, what equipment is in the system, and what condition it is in. Despite the learning curve, she looks forward to helping implement the new wastewater management program, which she says will be "better for the environment and our citizens." tpo

more info:

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www.dontechindustriesinc.com

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www.hfontaine.com

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800/227-4224
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www.lmipumps.com

Penn Valley Pump Company Inc.
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Siemens Water Technologies
800/525-0658
www.siemens.com/water

Vapex Inc.
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Every day is Earth Day.™

"I was named a Water Environment Federation Water Hero — professionals who 'protect public health and the environment by cleaning the world's water day after day.' But it was a good crew of operators who pulled together as a team. It was great to work with such fine people."

Jimmy Stewart
An Original Environmentalist

CHIEF OPERATOR (2000-08)
Shoal Creek Water Reclamation Facility,
Clayton County (Ga.) Water Authority

STILL AN ENFORCER

WALT BAUMER STILL UNCOVERS PLENTY OF CHALLENGES AND 'NEW THINGS TO LEARN' AFTER A DECADE WORKING AT THE WASTEWATER TREATMENT PLANT IN LEWES, DEL.

By Jack Powell

WHAT'S A FORMER POLICE OFFICER DOING AT THE HOWARD H. SEYMOUR Water Reclamation Facility in Lewes, Del.?

He's getting the drop on technical and regulatory challenges, skillfully managing a three-person staff and keeping the 1.5-mgd plant in compliance. Walter Baumer's focus, energy and commitment as project manager earned him recognition from the Delaware House of Representatives as 2008 Wastewater Operator of the Year.

The award cited Baumer for demonstrating "outstanding technical excellence and an exemplary work ethic, contributing to the high level of water quality in Delaware." That's not to mention his yeoman's work in 2005-07 on construction of the community's new wastewater treatment facility, incorporating membrane bioreactor (MBR) and biological nutrient removal technologies.

That project tested his team's ability to keep the water flowing in this ocean resort town of more than 3,100 full-time and 10,000 seasonal residents. He's also responsible for maintaining 32 lift and pump stations throughout the area.

"I was somewhat surprised to get the award, especially since a lot of good people were nominated," says Baumer. "The whole concept of working at a treatment plant has changed. It's much more technologically sophisticated, and this award recognizes the effort and study that goes into running a modern, highly complex operation like ours."

Walt Baumer, project manager, at the Howard H. Seymour Water Reclamation Plant, prides himself on keeping a strong working relationship with his small but accomplished staff. (Photography by Karl Richeson Photography)

WINDING ROAD

An 18-year water treatment plant veteran, Baumer has been manager of the Lewes facility since his employer, Severn Trent Services, entered a successful public-private partnership with Lewes in 2002.

Baumer's path to Operator of the Year has been twisty. A New Jersey native, he worked early in his career as a construction contractor and as a park ranger at Cape Henlopen State Park. Then he got into law enforcement, serving as a guard at the Delaware State Prison. From there, he became a police officer in Georgetown, but he hurt his back after only a year and had to resign.

Fortunately, his father-in-law heard of an opening at the wastewater treatment plant, and in 1992, Baumer signed on, starting in the plant.

"This has been a great experience," Baumer says. "It took me 10 years to earn my Level 4 operator's license, and I've enjoyed every minute of the learning experience. There is always something new to figure out, whether it's a piece of high-tech equipment or environmental and OSHA regulations. You never get bored, that's for sure."

To illustrate his point, Baumer cites the plant's decade-long evolution. When Baumer joined, it was a newly upgraded secondary treatment facility. Today, it is an MBR plant with a micro-filtration system that routinely exceeds permit requirements for BOD, nitrogen, TSS and phosphorous. Baumer lists three main reasons for the plant's success: technological, governmental and human.

ADVANCED TECHNOLOGY

The plant's Zenon membrane filtration system (GE Water & Process Technologies), UV disinfection system (Trojan Technologies), pre-thickened aerobic digestion membrane thickener (PAD-K) from Enviroquip – A Division of Eimco Water Technologies, and nutrient removal processes have played a big role in allowing the plant to reduce BOD and TSS load to the Lewes-Rehoboth Canal by about 2,500 pounds per month.

"The whole concept of working at a treatment plant has changed. It's become much more technologically sophisticated, and this award recognizes the effort and study that goes into running a modern, highly complex operation like ours."

WALT BAUMER

Walt Baumer has helped see the plant through a decade of evolution to its currect status as an MBR facility with microfiltration. The plant routinely outperforms permit requirements for BOD, nitrogen, TSS and phosphorous.

The Howard H. Seymour facility has been upgraded to 1.5 mgd but is capable of treating 2.2 mgd.

profile

Walt Baumer, Howard H. Seymour Water Reclamation Plant, Lewes, Del.

POSITION:
Project Manager (employed by Severn Trent Services)

EXPERIENCE:
18 years

RESPONSIBILITIES:
Oversee daily plant operations

CERTIFICATIONS:
Delaware Level 4 operator's license

AWARDS:
2008 Wastewater Operator of the Year, Delaware House of Representatives

Plant staff members, from left: Charles Simpson, maintenance supervisor; Dave Dunstan, operator; Lori Brown, assistant project manager; Walt Baumer, project manager. In the background is the plant's Zenon membrane filtration system (GE Water & Process Technologies).

Howard H. Seymour Water Reclamation Plant
PERMIT REQUIREMENTS
(30-day average)

BOD	16 mg/l
TSS	15 mg/l
Nitrogen	8 mg/l
Phosphorus	2 mg/l

At the same time, these advances have achieved effluent concentration levels of less than 3 mg/l total nitrogen and less than 0.5 mg/l total phosphorous. The nutrient load reduction in the canal totals 3,200 pounds per month.

Although the plant has been upgraded to 1.5 mgd from 750,000 gpd, it is expandable to 2.2 mgd. It hasn't approached that level "because the town government has done a good job of cutting down infiltration," Baumer says. Lewes officials hired a Severn Trent division to smoke-test the sewer system.

"The Lewes Board of Public Works has been very efficient in maintaining its sewers, which makes it a lot easier for us to do our jobs," says Baumer, who also served for 17 years on the Lewes Volunteer Fire Department. "I've had good relations with the local government. It has been cooperative every step of the way."

STRONG PRAISE

So has Baumer's staff: Lori Brown, assistant project manager; Charles Simpson, maintenance supervisor; and Dave Dunstan, operator. "I have a good team, that has been here a while, knows the issues and gets the job done no matter how challenging it gets," Baumer says.

Undoubtedly the biggest challenge Baumer and his staff faced was the upgrade of the treatment facility. The two-year, $11.7 million project doubled the plant's capacity and provided capabilities to improve the health of the Lewes-Rehoboth Canal and inland bays and meet new NPDES permit requirements.

The groundbreaking facility, designed by George, Miles & Buhr LLC, represents the first time membrane bioreactor and biological nutrient removal technologies have been combined by a Delaware municipality. GMB won the 2009 Grand Conceptor Award from the Delaware American Council of Engineering Companies for the project.

"Despite the award-winning design and advanced technologies, we still had half of the plant off line during construction and had to accept the usual flow," Baumer says. "Essentially, our capacity doubled and we had to do the best we could to keep in compliance. It was a big job that pushed everyone — me included. To expand the plant, we had to shut down half of our bioreactor and the digester and headworks so they could build half of the new

'A BLESSING IN OUR FAMILY'

Walt Baumer considers himself a lucky guy. He's got a "great job" and a wonderful family. And Derek, his 12-year-old handicapped foster son, "brightens up all our lives."

Baumer and his wife, Cyndi, a registered nurse, have had Derek since he was two. Daughter, Whitney, 19, majors in occupational therapy at Delaware Technical College. When they found out they couldn't have more children, they asked the state's foster care service "for a child, any child," including one with special needs.

Derek, who has cerebral palsy and mental retardation, came to live with the Baumers and, according to Cindy, "transformed our lives." Though he can't walk or talk and requires constant care, Walt and Cindy agree that "He's a blessing in our family, one who has brought us so much joy."

Says Cindy, who works with some 40 special-needs people in area group homes, "Walt walks on water as far as Derek is concerned. They love to do 'boy things,' like watch football games and rough-house on the floor."

Indeed, Walt says he gets a big kick out of coming home from the wastewater treatment plant and seeing the joy on Derek's face. "He lights up the whole place. We'll take care of him for as long as we're physically able. Derek is an inspiration, and we're very lucky to have him."

plant while the same flow was coming in. We were over capacity before the upgrade began."

Brown credits Baumer with keeping the plant on an even keel during the renovation. "Frankly, we couldn't have done as well as we did without Walt's expertise and calm guidance," she says. "Maybe it was his training as a guard or police officer, but he never got excited or lost his cool even when we'd have problems. That's the way he does everything — with quiet confidence."

Brown has worked with Baumer for almost eight years, joining the plant team after earning an associate degree in environmental engineering from Delaware Technical College. "I was new to wastewater treatment and had to get up to speed quickly," she says. "Fortunately, Walt took me under his wing and taught me so much. I would never have made assistant project manager without Walt's tremendous expertise and excellent teaching capabilities. I consider him an excellent boss and a good friend."

'VERY COMMITTED'

As for Baumer's work ethic, Brown is equally complimentary. "We're on call 24/7, and if I have to call Walt at two in the morning, I know he'll answer the phone and not sound angry," she says. "One time I had an electrical problem at the plant and needed to do some testing. So I called Walt at 4:30 a.m. and he tried to walk me through the procedure. When that didn't work, he got in his car and drove to the plant and we did the test. Not every supervisor would handle a situation so patiently."

> "Walt took me under his wing and taught me so much. I would never have made assistant superintendent without Walt's tremendous expertise and excellent teaching capabilities. I consider him an excellent boss and a good friend."
> **LORI BROWN**

Baumer's boss, Dave Fink, area manager for Severn Trent, agrees. "Walt is a very hard worker, very committed to the plant's success," he says. "He's the kind of guy who takes his laptop with him on vacation, checks his e-mail every day, and even answers phone calls if there are problems."

Fink, himself a 37-year industry veteran, praises Baumer for being "well rounded in all aspects of the business." He points to Baumer's hands-on management style and mentoring capabilities as well as his ability to rebuild pumps or fix equipment. And he, like Brown, believes Baumer was vital to the success of the plant expansion.

"Walt and his team had to overcome a lot of issues during the construction, and he did so without complaining," says Fink. "When it was over, he was given a rebuilt facility with state-of-the-art processes and immediately brought it into compliance. That in itself is worthy of an award."

Baumer, of course, downplays such praise, focusing on the job at hand: making sure he's up on regulatory changes and quickly arresting problems. "I'm a lucky guy," he says. "I've been a cop and a lot of other things, but I found a career that's really satisfying — one that lets me help people and make a difference in my community." **tpo**

more info:

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www.gewater.com

Severn Trent Services
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www.severntrentservices.com

Trojan Technologies
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www.trojanuv.com

ST50 Flow Meter Receives FM, CSA Certification

The ST50 thermal mass flow meter from Fluid Components International has received FM and CSA certification. The FM Approved mark assures safe and reliable performance, backed by independent research and testing. CSA certification means the flow meter has been formally evaluated through testing and follow-up inspection.

Apliclor Achieves Environmental Certification

P.S. Apliclor, S.A., a division of Severn Trent Services, has been certified as meeting the requirements of ISO 14001:2004 and ISO 9001:2008, the internationally recognized standards for environmental management systems and quality management systems. The accreditations relate to the design, manufacture, sale, assembly, installation and maintenance of water treatment solutions, including equipment and chemicals.

Amplio Group Forms Envirogen Technologies

The Amplio Group, London, has formed Envirogen Technologies Inc., a provider of environmental treatment technology and services to municipal and industrial markets. The company was formed from the assets of Basin Water Inc. and will offer a range of technologies and services, including wastewater treatment, odor control and more.

Aqua-Aerobic V.P. Joins Purdue Advisory Board

Chris Korab, vice president, human resources, Aqua-Aerobic Systems Inc., has joined the Industrial Advisory Board of the Department of Computer Graphics Technology at Purdue University. The board assists the department in enhancing the computer graphics technology undergraduate and graduate programs by providing advice, counsel and support.

Johnson Named to WERF Research Council

Dr. Terry Johnson, senior vice president for Black & Veatch, has been appointed to the Water Environment Research Foundation's research council for a three-year term. He will serve in the consulting sector, helping to shape and define future research areas. Johnson has 40 years experience designing municipal and industrial wastewater treatment facilities.


Dr. Terry Johnson

Smidler Named Senior VP and COO for Kaman Industrial

Steven J. Smidler has been named senior vice president and chief operating officer for Kaman Industrial Technologies Corp. He will oversee the company's sales, marketing, customer service and operational functions. Smidler has a bachelor's degree in electrical engineering from Purdue University and an MBA from the Fuqua School of Business at Duke University.

Cunningham Joins Industrial Scientific

Tom Cunningham has joined Industrial Scientific as vice president, global operations. He will be responsible for the company's manufacturing, supply chain and quality. Cunningham has a bachelor's degree in physics from Hiram College and a master's degree in electrical engineering from the University of Virginia and an MBA from The Wharton School at the University of Pennsylvania.

BlueVolt Partners with ClickSafety to Offer OSHA Certification

BlueVolt has partnered with ClickSafety, an authorized online OSHA outreach instructor, to offer OSHA certification and other safety training courses at BlueVolt University, www.bluevolt.com.

Calibration Guide Available from Dickson

Quality managers and others responsible for maintaining the integrity of temperature and/or humidity chart recorders or data loggers can download a guide to all aspects of instruction calibration from Dickson Co. at www.dicksondata.com/calibration/calibration_order.php.

In-Situ RDO Receives EPA Approval

In-Situ Inc. has received U.S. Environmental Protection Agency approval for its optical dissolved oxygen methods under the alternative test procedure, or ATP process, for measuring biochemical oxygen demand (BOD), carbonaceous biochemical oxygen demand (CBOD) and dissolved oxygen (DO) under the Clean Water Act. **tpo**

Just Right

THE WATER RESOURCES DEPARTMENT STAFF IN NEW SMYRNA BEACH, FLA., SAVES BIG ON ELECTRICITY BY OPTIMIZING RECLAIMED WATER SYSTEM PRESSURES

By Doug Day

PHOTOS COURTESY OF NEW SMYRNA BEACH, FLA. WATER RESOURCE DEPT.

This view looks south from the New Smyrna Beach plant toward the 13-acre reuse pond and irrigation area. Investing in the pond and irrigation helped reduce loss of water and energy to pump to the facility's river outfall five miles away.

Irrigation customers who use much of the reclaimed water from the New Smyrna Beach (Fla.) water reclamation facility plant haven't noticed a difference. Commercial irrigation storage ponds are still full, though it takes longer to fill them.

But the plant, owned by the Utilities Commission, City of New Smyrna Beach, has made substantial operational changes that are conserving energy and holding down electricity costs. By adjusting and optimizing pressure in the reclaimed water distribution system, the plant staff is saving about $140,000 a year. Similar changes at the drinking water plant next door are saving $100,000 a year while also reducing use from 199 gallons a day per connection to 195 with virtually no complaints.

SAVING THE RESOURCE

Built in 1998, the 7-mgd advanced treatment plant creates high-quality effluent, most of it reclaimed for irrigation for homes, golf courses, and other large commercial customers. "The water resource is very precious, especially in Florida, where there is a limited amount of freshwater and we're surrounded by saltwater," says Dave Hoover, director of the Water Resources Department.

The plant is allowed to discharge up to 30 percent of its treated water into the Indian River. Over the last three years, an average of 85 percent of the wastewater coming to the plant has been reclaimed. That number reached 90 percent over the last year. "We're real excited about it," says Hoover. "A lot of the investment our utility and ratepayers have made in irrigation piping and developing an adequate customer base has paid off," Hoover says.

What's Your Story?

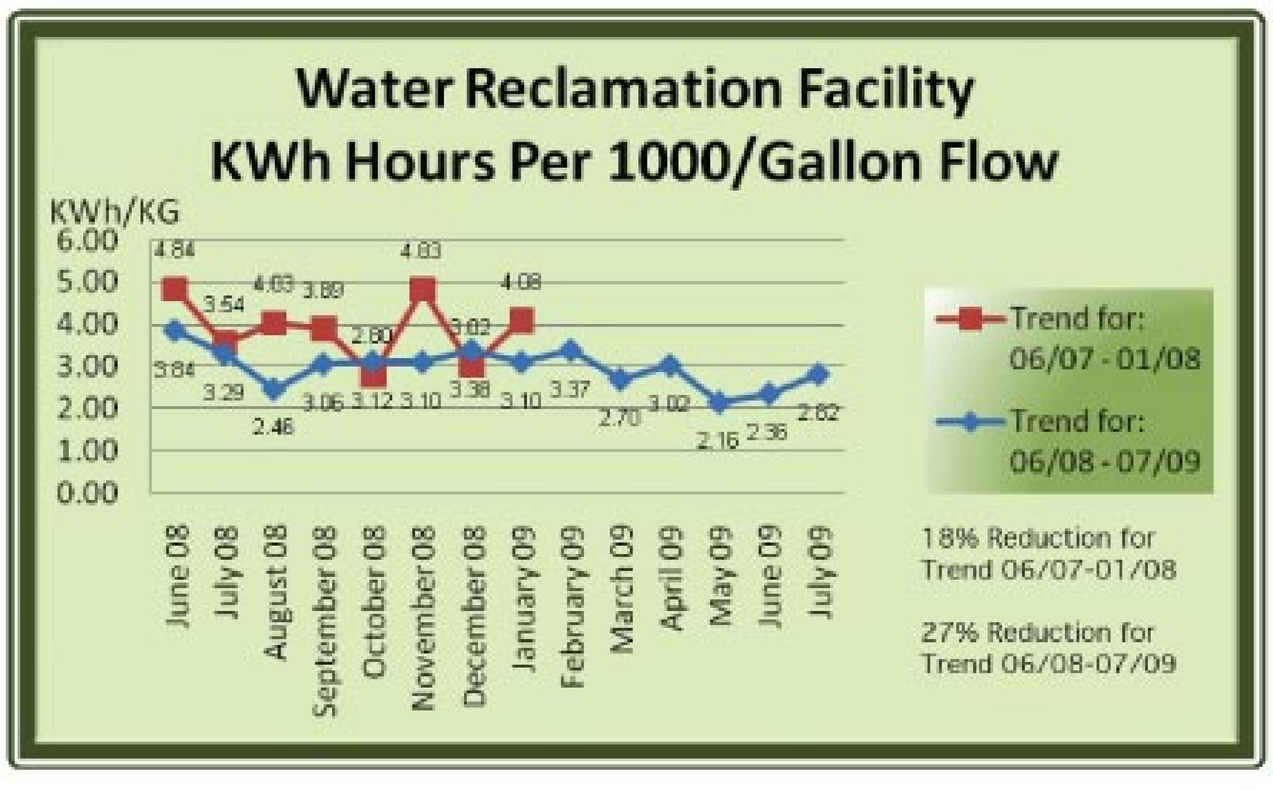
***TPO* welcomes news about environmental improvements at your facility for future articles in the Greening the Plant column. Send your ideas to editor@tpomag.com or call 877/953-3301.**

Water reclamation reduces the amount of drinking water used for irrigation and keeps more water in the aquifer. The ecological importance of that is always on Hoover's mind, but recently his thoughts have been on system pressure. Less pressure in the system means less power demand from the plant.

Hoover got the idea for optimizing pressures from a local utility commercial. "The commercial said that by using two settings on your thermostat — one for when you're at home and one for when you are away — you could save as much as 20 percent off your energy bill every month," he recalls. "Another commercial said that if you reset your cruise control to 65 instead of 75, you could save 20 percent on your fuel cost."

The wastewater plant had always operated with a system pressure of 75 psi. "I kept looking at that, and those commercials kept coming back to me," Hoover recalls. "I became convinced that we didn't need to put out 75 psi." His goal was to use the many

Water reclamation energy savings.



The five reuse pumps, including two 250-hp units (Emerson Motor Technologies/U.S. Motors) with vertical turbine pumps. Reducing pressures and using different pressure settings for each of the three daily shifts yielded significant energy savings.

ENERGY SAVINGS FROM NEW PRESSURE GUIDELINES

	BEFORE	AFTER 9 MONTHS	AFTER 14 MONTHS	ANNUAL SAVINGS
Water Reclamation Plant	3.88 KWh/Kg	3.17 KWh/Kg (-18 %)	2.83 KWh/Kg (-27%)	$140,000
Water Treatment Plant	3.0 KWh/Kg	2.45 KWh/Kg (-18.3%)	After 15 months: 2.46 KWh/Kg (-18%)	$100,000
TOTAL SAVINGS				**$240,000**

variable-speed drives (Yaskawa Electric America) in the plant to respond to demand on the system, rather than setting them for peak demand at all times.

COST CONTAINMENT

The Utilities Commission had asked the Water Resources Department to evaluate every aspect of performance to see where costs could be contained and money saved in a difficult economy.

So Hoover worked with operators and the plant supervisor to refine the operating strategies and reduce the maximum pressure from 75 pounds to 70, and to limit the hours when the maximum pressure could be used. "The only time we allow 70 psi is the overnight hours when customers are allowed to use landscape irrigation," he says.

"There is reasonable justification for running 70 pounds when you're trying to use up reclaimed water as people are using irrigation systems, rather than dumping it into the river. But it only represents about 25 or 30 percent of the day." To conserve water, the 732 residential irrigation customers are allowed to water lawns only during night hours, when less is lost to evaporation.

Outside of irrigation hours, treatment plant operators are now limited to 60 or 65 psi. That is adequate for filling seven golf course and commercial storage ponds. "It takes five hours instead of three, but we use less power," he says. The ponds aren't used for irrigation during the day, so there is no hurry to fill them.

The same is true of filling the plant's own storage systems. "We have a 13-acre storage pond and seven million gallons of storage tanks, but when they're full and the demand for reclaimed water is low, we have to discharge into the river," Hoover says.

When that happens, the pressure is set even lower. "Nobody's using any reclaimed water and you're just releasing excess water into the river. Instead of doing it at 75 pounds and just pushing it into the river when it is necessary for operational purposes, let's do it at 55 to 60 pounds."

Hoover and his staff also modified and enlarged the plant's own Hunter Industries irrigation system, and the plant becomes its own largest customer when others aren't using reclaimed water. Nourishing the 800 acres of wetlands on the property can use a sig-

NEW SMYRNA BEACH OPERATING GUIDELINES

SHIFT	PRESSURE	PLANNED GOALS	ESTIMATED FLOW
First Shift (overnight)	70 psi	Midnight - 8 a.m.: Maximize use by automatic irrigation unless drought conditions require conservation measures by customers	+/- 4 MG
	65 psi	Rest of shift (If reuse tank is dropping too fast, adjust pressure to minimum of 60 psi)	
Second Shift (days)	65 psi	Fill 2-million-gallon tank Fill 7 commercial ponds	1-2 MG
Third Shift (Evening)	60 psi	Fill 2-million-gallon tank Fill 13-acre pond if needed	2 MG 1 to 1.8 MGD
Outfall to River	55-60 psi	Regardless of shift, 60 psi will be maximum pressure	

GOALS

- Maintain satisfactory use of reclaimed water while minimizing energy use.
- Serve 732 residential irrigation customers from midnight to 6 a.m.
- Provide water to seven commercial irrigation storage ponds — fill to capacity daily.
- Maintain proper levels on 2-million-gallon storage tank.
- Maintain proper levels in 13-acre storage pond.
- Use plant and utility property irrigation system to maintain ecosystems.

nificant amount of water. "We're managing our resources rather than losing that freshwater into the saline environment of the Intracoastal Waterway," says Hoover. "That builds credibility and support with regulators and conservationists while protecting other ecosystems."

ENVIRONMENTAL STEWARDS

After 33 years in the industry, Hoover says these are exciting times. "Wastewater treatment plants used to be called treatment and disposal facilities," he says. "Now we're recycling on the highest level we can. We're taking domestic wastewater and cleaning it up to where it just about meets drinking water standards again. It's cleaner than most lakes in Florida, and our lake water is exceptional. Our operation employees now see themselves as environmental stewards of one of our most important natural resources."

Through irrigation, New Smyrna Beach is reducing demand on the state's water resources. "Ninety percent of our water comes from the Upper Floridan Aquifer," Hoover notes. "That is a finite water source that has very pure water. But if we draw water out too fast as the state grows in population and water demand, we can cause saltwater intrusion and ruin our water source to the point we have to go to desalination plants that are much more expensive.

"So our regulatory agencies, and all of us in the industry, are very motivated to try to clean up our wastewater enough so that we can safely distribute it as irrigation water."

The 13-acre reuse pond was instrumental in enabling more reuse rather than discharging water to the ocean outfall.

The entire commission staff looks forward to the day when nothing gets discharged to the river and ocean, says Hoover. "Our goal is 100 percent reclaimed water use, and we're going to get there. Our strategy reduces the loss of water into the ocean, reduces excessive pressures, and cuts our energy costs." **tpo**

more info:

Emerson Motor Technologies
888/637-7333
www.usmotors.com

Hunter Industries Inc.
760/744-5240
www.hunterindustries.com

Yaskawa Electric America, Inc.
847/887-7000
www.yaskawa.com

Two Becoming One

A WISCONSIN COMMUNITY MAKES A DEWATERING BELT PRESS DO DOUBLE DUTY FOR WATER TREATMENT LIME SLUDGE AND WASTEWATER BIOSOLIDS

By Ted J. Rulseh

PHOTOS COURTESY OF BRIGHT TECHNOLOGIES

City of Beaver Dam utility foreman Rob Minnema and operator Greg Goodrich review the touchscreen controls on the skid-mounted belt filter press from Bright Technologies. The press serves both the water and wastewater sides of utility operations.

The City of Beaver Dam (Wis.) water and wastewater utilities are pulling closer together, in part thanks to a dewatering system that now handles lime slurry from the water treatment plant but will eventually handle wastewater biosolids, too.

In July 2008, a 1.7-meter skid-mounted belt filter press from Bright Technologies went to work at the wastewater treatment plant, dewatering lime slurry trucked over from the water plant across town, about one mile away.

The press has already driven down the water utility's lime slurry handling costs by producing cake at greater than 60 percent solids for land application as a soil amendment on two local farms.

THROWN A CURVEBALL

Beaver Dam, a city of about 15,000 in south central Wisconsin, operates separate water and wastewater utilities. The activated sludge wastewater treatment plant handles average flows of 4.3 mgd. The 5.8-mgd water treatment plant uses lime softening, the source of the lime slurry, produced at 1.5 million gallons per year.

For years the water utility wasted lime slurry from the water plant clarifiers, held it in storage tanks, and hired a contractor to haul it to farm fields for land application. In early May 2008, the state Department of Natural Resources (DNR) determined that the lime slurry could no longer be land-applied under regulations that applied to wastewater biosolids and instead had to be treated as solid waste and landfilled.

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.

Send your ideas to editor@tpomag.com or call 877/953-3301

However, the city could not landfill its lime slurry because, in its liquid state, the material could not pass the filter test needed to prove that landfilled material contains no free liquid. That meant the city's contractor had to haul the material to its own storage facility and mix it with other sludges before landfilling. That more than tripled the handling cost from about 3 cents per gallon for the land application program to more than 9 cents per gallon.

ACTING QUICKLY

Meanwhile, the water plant was producing about 7,000 gpd of lime slurry. The existing belt filter press at the wastewater plant had been in service for 25 years and was not sized to handle the additional volume.

To solve the problem, utility director Don Quarford and utility foreman Rob Minnema quickly went to work on a dewatering system with the help of Tom Stebbins, operations and process specialist with Bright Technologies. In the third week of May, Stebbins organized and completed an onsite pilot test showing that a belt filter press could take lime slurry at 15 to 20 percent solids and produce a cake containing more than 60 percent solids that would pass the filter test for landfilling.

After a successful pilot test, the city decided to acquire a belt filter press from Bright Technologies. The skid-mounted belt press system was manufactured, installed and operational at the wastewater treatment plant in a temporary installation in less than 60 days. Then, with

The 1.7-meter belt filter press from Bright Technologies has driven down water treatment plant lime slurry handling costs and is also used at times to dewater wastewater biosolids.

"Right now, we're using the press to dewater the lime slurry, but have used it to dewater wastewater biosolids at times when we're behind in processing the material on our existing dewatering press."
ROB MINNEMA

the assistance of Bright Technologies the city designed and built a permanent facility for the press, completed in December 2008.

"Right now, we're using the press to dewater the lime slurry, but we have used it to dewater wastewater biosolids at times when we're behind in processing the material on our existing dewatering press," says Minnema. "Eventually, we will waste biosolids directly from digester to the press and regularly use it to batch process either biosolids or lime slurry." The existing belt filter press will eventually be used as a backup while the new press will be the primary press for both utilities.


The belt filter press gravity deck in operation.

The latest analysis showed the press delivering biosolids cake at 22 to 25 percent from liquid material coming from the digesters at 2.5 to 3 percent solids. The plant's biosolids are land-applied. The city's total biosolids output is about 1,350 dry tons per year, and the lime slurry output is 1,600 dry tons per year.

ATTRACTIVE COST

Initially, the city dewatered and landfilled the lime slurry material at a cost of nearly 8 cents per gallon. Then Stebbins used his 20-year background, as a contractor in the liquid and solid waste recycling industry, to work with the DNR and help the city get a variance for two farmers to land-apply the dewatered lime cake for beneficial reuse.

Therefore, the city has discontinued landfilling. In some cases, the city mixes lime slurry with biosolids to produce a more beneficial soil amendment, according to Minnema.

The city bought the press on a five-year lease-purchase plan that allows the utility to include its capital and operating costs in the same budget category that covered the hauling of liquid slurry. The water utility now pays farmers $6 per cubic yard to haul and land-apply the lime slurry cake.

"We are paying a lot less to handle it now," says Minnema. "We just have to haul it across town and press it. Our total cost is about 3.25 to 3.3 cents per gallon, counting our lease cost, operations, chemicals and transport. When the lease payments end in five years, that's when we'll really see the savings."

SMOOTH PROCESS

The lime slurry process is simple and automated. Lime transported from the water treatment plant is received in an 18,000-gallon nurse tank. The material is drawn onto the press by a Boerger rotary lobe pump mounted on the press skid. Cationic polymer is added to flocculate the lime, and the mixture is introduced to the gravity section of the press, where primary drainage occurs.

From there the material enters the radius wedge section of the press. The radius wedge brings the material into contact with both belts sooner than in a typical linear wedge section and applies pressure over a greater area. The large radius of the wedge simulates a large-diameter roll and promotes rapid drainage.

The material then enters the high-pressure section of the press, with a series of eight pressure rollers. The first roller is a wing roll with 50 percent open area that further aids in dewatering. The radius wedge and open wing roller design increases useful dewatering space within the press, making the process more efficient and giving the press a smaller footprint, according to Stebbins. The finished cake exits onto a belt conveyor that carries it to a storage building next door.

A Siemens touchscreen control panel will be tied into the plant SCADA system, enabling the staff to monitor and operate the press from anywhere in the facility.

LOOKING AHEAD

Minnema notes that the wastewater treatment plant has received $20 million in federal government stimulus funds, half as a grant and half as a loan. The city will use part of the money for equipment upgrades throughout the plant that will make the belt filter press a more integral part of the facility.

"The new press really benefits both the water and wastewater utilities," says Minnema. "In the past, the two utilities have operated essentially as separate entities. With the management structure we have in place now, we operate more as one utility. The belt press delivers efficiencies and cost savings that help both sides in the long run." tpo

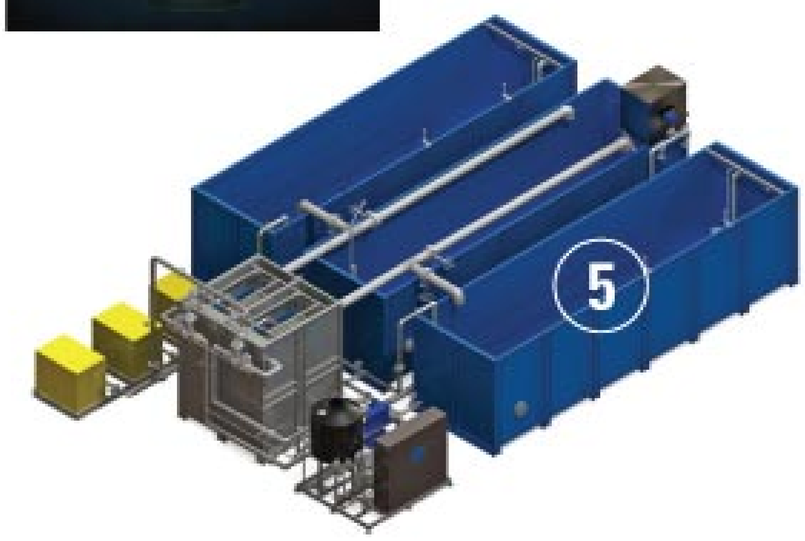
"The new press really benefits both the water and wastewater utilities. In the past, the two utilities have operated essentially as separate entities. With the management structure we have in place now, we operate more as one utility. The belt press delivers efficiencies and cost savings that help both sides in the long run."
ROB MINNEMA

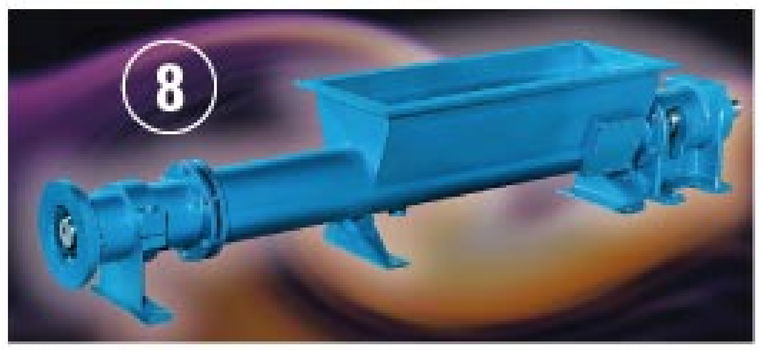
more info:

Boerger LLC
877/726-3743
www.boerger-pumps.com

Bright Technologies/ Division of Sebright
269/793-7183
www.brightbeltpress.com

Siemens Water Technologies
800/525-0658
www.siemens.com/water





1. ACCUTECH RELEASES TM10 TURBINE METER

The TM10 turbine meter from Accutech, a division of Control Microsystems, offers flow rate and total accumulated flow volume data for standard turbine meters. Field units automatically report data to a centralized base radio up to 5,000 feet. Each unit is self-contained, features integrated 900-Mhz frequency hopping, spread-spectrum transceiver, antenna and long-lasting battery. **www.controlmicrosystems.com.**

2. BIOAIR OFFERS LINE OF ODOR REMOVAL PRODUCTS

EcoBase synthetic media from BioAir Solutions is designed to provide uniform air flow, optimized mass transfer of odor compounds and a controlled microenvironment that promotes the growth and proliferation of specific odor-removing bacteria. The filter can treat airstreams from 100 cfm to more than 100,000 cfm, removing organic and inorganic odorous compounds. **856/258-6969; www.bioairsolutions.com.**

3. GENERAL MONITORS OFFERS MC600 GAS DETECTOR

The MC600 six-channel controller from General Monitors is available for Class 1, Division 2 applications in hazardous environments. Designed to provide continuous gas monitoring when equipped with gas sensors/transmitters, the controller features a corrosion-resistant Type 4X housing. An onboard 115/230 VAC power supply is available. Signal conditioning boards for H2S/hydrocarbon sensors and a 4-20 mA interface for intelligent detectors can be installed or removed from plug-in slots. **949/581-4464; www.generalmonitors.com.**

4. TUTHILL OFFERS QUBE BLOWER PACKAGE

The Qube blower package by Tuthill features a Qx blower for wastewater aeration. The compact unit is enclosed in powder-coated steel, reducing noise to 24 dBA. The unit also has an integral check valve, back discharge and flexible discharge connector. **800/825-6937; www.tuthill.com.**

5. KOCH INTRODUCES PURON PLUS MCR PACKAGED SYSTEM

The Puron Plus skid-mounted membrane bioreactor plant packaged system from Koch Membrane Systems is designed for industrial and municipal wastewater needs. Plant capacities range from 5,000 to 100,000 gpd and feature Puron MBR membrane modules. **888/677-5624; www.kochmembrane.com.**

6. LAYNE CHRISTENSEN OFFERS CHEMICALLY-RESISTANT MBR

Chemically-resistant membrane bioreactors from Layne Christensen Co. feature strong, hollow Poreflon filtration fibers that can operate in environments up to 122 degrees F. The fibers are stable against acids, alkaline solutions, oxidizers and solvents, and can survive rigorous cleaning cycles. Highly hydrophilic Poreflon needs no pretreatment and can be stored dry. **262/246-4646; www. laynechristensen.com.**

7. VAPEX INTRODUCES HYDROXYL ION ODOR CONTROL

The O-Mega model v2500 hydroxyl ion fog odor control system from Vapex Environmental Technologies Inc. features a low-power, high-output ozone generation system and rechargeable oxygen generation system capable of treating enclosed chambers up to 16,000 cubic feet and up to 250 ppm of hydrogen sulfide. **407/977-7250; www.vapex.com.**

ALLMAX RELEASES SYNEXUS PRETREATMENT MANAGEMENT SOFTWARE

The Synexus pretreatment data management and reporting software from AllMax enables users to accept and regulate industrial flows and generate reports. Originally included in the suite of Operator 10 wastewater and water applications, it has been re-engineered and given its own identity and specialization. Improved interactivity provides more flexibility and quicker paths for changes and edits. **800/670-1867; www.allmaxsoftware.com.**

8. MOYNO OFFERS G2 PROGRESSING CAVITY PUMP

The Moyno 2000 Model G2 progressing cavity pump by Moyno Inc. features an open throat hopper design with auger for positive product feed when handling semi-dry or high-solids-content sludges. Other features include crown gear-type universal joint, flow rates to 400 gpm and pressure capabilities to 350 psi. The pump can pass particles up to 1.5 inches in diameter and handle fluid viscosities up to 1 million cps. Varying hopper sizes are available. **877/486-6966; www.moyno.com.**

NOREN OFFERS HEAT-REMOVING CABINETS

Drop-in air-to-air compact cabinet coolers from Noren Products Inc. remove waste heat from sealed electrical panels and enclosures without exposing sensitive electronic components to harsh, dirty environments. The coolers, which use heat pipe technology, extend into the panel from the side, top, front, or back, minimizing the external footprint. With no exchange of air from inside to outside, the inside of the cabinet remains cool, dry, and free of contaminants. **866/936-6736; www.norenproducts.com.**

(continued)

product spotlight

MicroSludge System from Paradigm Environmental Technologies

MicroSludge Pretreatment Biogas System Lets Operators Test Before Buying

By Ed Wodalski

A portable pilot version of the MicroSludge System from Paradigm Environmental Technologies, designed to produce more biogas from anaerobic digesters in less time, enables treatment plant operators to test the technology in-house before deciding if it's right for them.

"Operators need to minimize the risk of adoption of any new technology," says Filipe Figueira, director of marketing. "The truth is that all plants are different and all sludge is different. A pretreatment technology that may work at full scale in one part of the country may not work economically or technically at a given plant. This system lets prospective users see the results they are likely to get in about six months, at the fraction of the cost of a full system."

While it's possible to convert about 60 percent of primary sludge to biogas, only about 30 percent of waste activated sludge (WAS) is typically converted to biogas in an anaerobic digester, Figueira says. To increase biogas production and the speed of digestion, the pretreatment system makes it easier for the digester to break down WAS.

"What MicroSludge does is smash up the microbes and liquefy them," Figueira says. "It's like chewing your food very, very well before swallowing it — you are going to get much better digestion."

However, just as all food is not identical, the same is true of sludge. "All sludges have different characteristics, such as level of volatile solids and biogas potential, propensity for foaming, dewaterability, and odor," Figueira says. "So by running a pilot system, we can establish the range of benefits a plant is likely to see at full scale, and therefore have much better data with which to make plant improvement decisions."

A recent pilot system beta site was able to reduce digestion time from 30 days to seven days without affecting performance. "That can have a massive impact on wastewater treatment plants that need to build new digesters because they're running out of capacity," Figueira says. "By putting in MicroSludge, these plants can make better use of existing infrastructure, generate more biogas, and produce less biosolids from existing digesters."

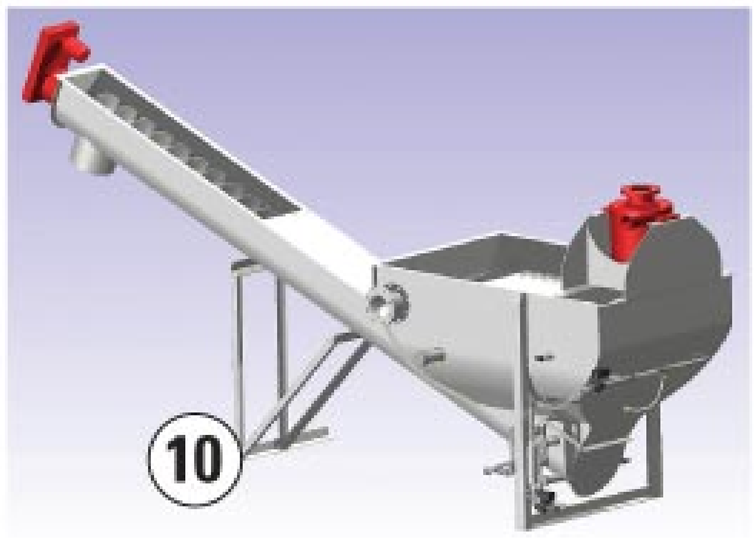
The system, mounted on three 8- by 8-foot skids, consists of a pretreatment unit and four 400-gallon digesters, equipped with temperature control and gas measurement. The system also includes automatic daily collection of sludge feed and effluent samples for conventional testing. The digesters can be configured to test various operating conditions, such as acid phase, digesters in series or parallel, and thermophilic digestion. **604/742-0360; www.microsludge.com.**

9. TOPP OFFERS PREMIUM SERIES BASINS

Premium Series corrosion-resistant and high-temperature fiberglass basins with vinyl ester resin from Topp Industries Inc. are made to resist acids, alkalis, hypochlorites and other solvents, as well as temperatures up to 220 degrees F. **800/354-4534; www.toppindustries.com.**

10. SMITH & LOVELESS INTRODUCES PISTA GRIT WASHER

The Pista Turbo grit washer with Tri-Cleanse Technology from Smith & Loveless Inc. offers 95 percent grit retention down to 140-mesh particle size. Features include hydroflushing and high air infusion to aid in organic separation, as well as a custom-engineered screw to further clean grit through additional agitation. A dedicated PLC controller guides the washer through its various cycles. **913/888-5201; www.smithandloveless.com.**



11. WEMCO OFFERS GRIT REMOVAL PUMP

The Hydrogritter from Wemco Pump pulls grit from the source and feeds it to a cyclone separator. The grit is then concentrated and discharged into a spiral classifier for washing and dewatering. The system automatically generates a clean, low-moisture product that is safe for transport and disposal. **801/359-8731; www.weirsp.com.**

12. LOWELL INTRODUCES HYD-3D DEWATERING PUMPS

The HYD-3D TrunkPump line of hydraulically powered dewatering pumps from Lowell Scott Enterprises Inc. can be powered by skid-steer remote hydraulics and other hydraulic power sources. Pumps come in a roll cage configuration with camlock pump fittings, hydraulic flow regulating manifold and 8-foot hydraulic hoses with male and female Flush-Face Quick Disconnect couplings. The HYD-3D 3-inch dewatering pump has a flow of 280-plus gpm, while the HYD-2D 2-inch pump has a flow of 190-plus gpm. Both pumps have a total dynamic head of 70-plus feet, are self-priming to 25 feet, have a built-in check valve, measure 25 x 19 x 19 inches and weigh 75 pounds. **910/463-1282; www.trunkpump.com.** tpo

Keeping Tabs on Maintenance

A CAREFULLY CHOSEN COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM CAN HELP YOU KEEP YOUR PM PROGRAM UP TO DATE AND YOUR PLANT RUNNING SMOOTHLY

By James E. Didawick

Any operator who has worked in wastewater treatment for any length of time knows the importance of a good maintenance program. Maintenance can make the difference between operating well and being in violation.

Facilities are constantly being upgraded and expanded, often with new processes, such as nutrient removal. Besides major changes in the way wastewater is treated, that means substantial changes in the approach to maintenance. More complex equipment means more and different maintenance tasks and possibly a revamping of a plant's entire PM program.

Maintenance can be defined as "work that is done regularly to keep a machine, building, or piece of equipment in good condition and working order." But what are the necessary parts of a good maintenance program? One of them is computerized maintenance management software — the complexity of today's treatment systems essentially demands it.

Gary Richman, chief operator at the Town of Woodstock (Va.) treatment plant, checks the facility's computerized maintenance management system. (Photography by Lauren Didawick)

FINDING A FIT

In today's market, there are many types of maintenance programs, from very basic to the highly complex. The key is to find the one that best suits your facility, is easy for operators to learn and use, and will be able to expand and grow as your facility does.

A programmable thermostat is one way to keep control of heating costs.

There are several ways to search out the most appropriate program. The Internet is one place to start. Another is to work the phones and see what your counterparts at similar facilities use. This is a great way to get unbiased information: Operators usually talk freely about what works well for them and — even more important — what doesn't.

If possible, visit a facility using the software you are considering. Nothing is better than seeing the product in action and talking with those who use it daily. Ask plenty of questions. What do they like and dislike? What would they do differently if they could start over? Would they buy the same product again? If not, why?

As you get closer to choosing a program, sales representatives should be happy to meet with you and discuss their products. Ask for a demonstration copy of the program, if one is available. That will allow you to explore the product's capabilities and make notes on any questions you have.

Ask for a client reference list with contact information. Most companies will gladly provide it. If that isn't possible, visit a plant that uses the product, or at least talk to the plant staff by telephone.

When buying a program, ask the sales representative about a reduced price for extended licensing agreement fees. If you can make a long-term commitment to the product, you may be able to negotiate a reduced rate and save money in the long run.

GETTING SET UP

The old adage that "you get what you pay for" is entirely true. A program purchased at a "bargain" price may not fit your needs and may give you substandard performance.

Flexibility is a key to any maintenance software, as you will have to tailor it to your facility. Most quality programs can be customized. (If you can't find exactly what you want "off the shelf," a custom-written program is an option, but that can cost significant time and money.)

All new software comes with standard operating instructions and a warranty. Start with your local sales representative for any questions or problems you encounter. They want you to be satisfied and will usually go out of their way to help you. They know you will tell others if you get good (or not-so-good) service and technical support.

Almost every facility has at least one operator with above-average computer skills and technical ability. If possible, ask him or her to work with the company representative in setting up the program. At first, the software technician will enter the data while conferring with your staff about specific information on each piece of equipment.

As the process goes forward, your staff should begin working side-by-side with the technician in entering data. Ideally, by the end of the process, the technician simply observes and supervises while your staff members complete the entries.

In the end, your maintenance program will be only as good as the people who run it. Even the best software will not function properly without operators who are solidly trained and carry out what they have learned in a reliable manner.

When purchasing the product, it is wise to arrange in the contract for some periodic visits from the installation technician. This will enable you and your team to review any updates to the software and discuss any pertinent changes in person. (Most routine software upgrades can be accomplished via e-mail, with no on-site assistance.)

SMOOTH DATA EXCHANGE

Of course, just having the software does not mean you have a maintenance program. To have an effective program, you need to decide specifically what equipment you need to monitor and the operating ranges and service intervals for each device. Refer to your owners' manuals for manufacturer's PM recommendations. If you use a SCADA system, you may already have most of the monitoring information in place, and you can use it in setting up your maintenance program.

For example, if the PM software has an interface, you can enter operational data via the SCADA system or another compatible application without having to re-enter it manually. This will save time and reduce the risk of entry errors. Once you have the data onboard, you will be able to share it with other applications — such as spreadsheet and word-processing programs — that support the system.

Furthermore, automatic data collection points in the treatment plant will be able to send data (flow, DO, pH, RAS) to your maintenance software and into your maintenance database by way of the SCADA system. You can then access that information through the network server, and from there send it to individual workstations and printers, where it can be used for reporting and process control.

Public Works superintendent James Didawick checks the system control panel in the solids handling building.

LISTING MUST-HAVES

Maintenance software packages are designed to require only a minimum of orientation and training. The on-site training days in your proposal may well be more than you need or want, as your staff sees how intuitive and useful the program is out of the box. Your staff workloads and schedules may largely determine how much on-site training time you need during startup.

Here are some key items you should make sure are included when you purchase maintenance management software:

- Warranty information.
- Inclusion of all upgrades as the software product evolves.
- On-site setup, installation, and orientation/training of all staff, on all shifts.
- Multiple User Work Group: Do you want the program accessible by several team members, or by just one person?
- Unlimited online and telephone support for a minimum of one year.
- On-site technical assistance for a specified minimum number of days (to be negotiated).
- An extended license agreement package effective after the first year.

In today's market, there are many types of maintenance programs, from very basic to the highly complex. The key is to find the one that best suits your facility, is easy for operators to learn and use, and will be able to expand and grow as your facility does.

- Overall project management and system startup.
- Organizing and inputting of equipment lists and initial scheduling for new and old equipment.
- Assistance with interface implementation.

In addition, you can negotiate other on-site work from the software vendor as you consider appropriate for your staff.

SYSTEM INTERACTION

As for computer workstations, any good business-class computer should be more than adequate to run your new program. You can choose either desktop or laptop units — whichever best fits the location where it will be used.

Many maintenance programs now offer a handheld field unit which allows operators to take a paperless copy of the PM program into the field. This is especially helpful when maintaining multiple facilities or lift stations. For obvious reasons, such units should be weatherproof and shock resistant.

As with laboratory analysis, accurate recordkeeping is essential to a good maintenance program. Operational logs and maintenance files on each piece of equipment will serve as a guide to how well those devices are operating, whether components are deteriorating, and what personnel performed which specific maintenance on which devices.

Regardless which maintenance program you choose, it should be able to handle all these tasks at a minimum:

- Maintain detailed information on equipment, PM schedules, work orders and associated costs for repairs.
- Track inventory levels, spare parts costs, and reorder levels.
- Create and clear work orders for scheduled, unscheduled, corrective, and emergency tasks.
- Use the assembled data to generate reports as needed.
- Track hour meter, pressure gauge, odometer and other instrument readings.
- Maintain a list of vendors or manufacturers for your facility that can provide repair services, rental equipment, materials, parts, and other items.

NEVER MORE IMPORTANT

The end goal of maintenance is to take care of the equipment, not only preventing and minimizing breakdowns, but also ensuring the safety of the operating staff.

With national economic concerns filtering down to local levels, operating expenses are coming under cost scrutiny: Treatment plant personnel are being asked to achieve the same levels of treatment at less cost.

Regulations, licensing requirements, and laboratory analysis procedures are all under constant review and are not likely to become less stringent. The question of how to do more with less has never been more prevalent than today.

Wastewater treatment is a challenging profession, even on the best of days. As treatment techniques evolve, with a little prior planning, your maintenance program can grow and expand along with your facility well into the future, ensuring an efficient and economical operation along the way. tpo

ABOUT THE AUTHOR

James E. Didawick is superintendent of Public Works for the Town of Woodstock, Va. He can be reached at 540/459-3045 or woodpw@sbentel.net.

James Didawick inspects wiring in an electric valve.

product focus

Manufacturers Offer Innovations in Biosolids Management

By Scottie Dayton

Level Lodor from JDV Equipment Corp.

GREENER SOLUTION

Byo-Gon from Byo-Gon Inc. is a blend of natural plant alkaloids that accelerates the wastewater treatment process using existing bacteria. The alkaloids lower BOD and TSS, reduce oil, grease, and sludge, eliminate odors, and reduce sludge volume in ponds and lagoons.

Xeronine, the cell growth accelerator alkaloid, restarts enzymatic processes and promotes more rapid cell growth, overcoming limiting conditions. Injecting the alkaloid causes a shift from anaerobic fermentation to anaerobic respiration with more rapid growth and activity of facultative anaerobes. It also increases the activity of anaerobic and aerobic organisms.

Using advanced second-generation adenosine triphosphate measurement technology to confirm increased biological activity, operators can customize application dosages and treatment protocols depending on biological health. The product requires no special handling or equipment. It is nontoxic, nonflammable, noncorrosive, organic and biodegradable. **888/296-4661; www.byogon.com.**

ISOLATED SOLENOIDS

Rotary shaft style valves from Clark-Cooper isolate the solenoid components from the process fluid, enabling them to handle extremely corrosive dirt, or viscous fluids. The valves, available in stainless steel, hastelloy, and monel, can be custom built to pipe sizes from 1/2-inch NPT to 6-inch 150 number flanges. Solenoid enclosures are rated NEMA 4X and explosion proof. Options include position switches, manual override, and emergency trip with manual reset. **856/829-4580; www.clarkcooper.com.**

WASTE DISPOSAL

The **Level Lodor from JDV Equipment Corp.** covers standard dumpsters used for hauling processed material. The unit helps contain odors and facilitates even distribution, which increases the fill percent without manually leveling the waste. When stored outdoors, enclosed dumpsters control pests better, protect the contents from the environment, and free critical or limited indoor square footage. **973/366-6556; www.jdvequipment.com.**

COMPLETE SYSTEM

The **ISAM (integrated surge anoxic mix) sludge reduction system from Fluidyne Corp.** has a constant level anaerobic basin, surge-anoxic-mix (SAM) tank, and aeration basin. The basin, with BOD, TSS, and nitrogen removal, reduces sludge as much as 85 percent in integrated systems.

Wastewater enters a covered anaerobic reactor for pretreatment, sludge thickening and sludge destruction. Complex organic solids undergo hydrolysis to simpler soluble organics, which pass to the SAM tank. It regulates flow and provides an anoxic environment for rapid denitrification. The conditioned mixed liquor then passes to the final aerobic tank for completion of BOD and nitrogen removal and solids separation. A proprietary control system paces the operation, producing tertiary water quality. **319/266-9967; www.fluidynecorp.com.**

SOLAR DRYING

Once unloaded in the greenhouse, the automated **SOLIAMIX system from Kruger Inc.,** a Veolia Water Solutions and Technologies company, forms dewatered biosolids into triangular windrows, maximizing the drying surface area. The mechanism turns the windrows at regular intervals, aerating the biosolids and promoting

Byo-Gon from Byo-Gon Inc.

Rotary shaft style valves from Clark-Cooper

ISAM (integrated surge anoxic mix) sludge reduction system from Fluidyne Corp.

SOLIAMIX system from Kruger Inc.

Rotary fan dewatering press from Prime Solution Inc.

BIO ENERGIZER biostimulant from Probiotic Solutions

fermentation, which generates a high temperature increase (122 to 140 degrees F) to accelerate the drying. The system produces 45- to 90-percent dry solids content, or a 3-to-5-fold reduction of final to initial quantity. **919/653-4574; www.krugerusa.com.**

ROTARY FAN PRESS

Available in four sizes, the **rotary fan dewatering press from Prime Solution Inc.** operates continuously at 1 rpm. Totally enclosed compact skid and mobile models are cost effective, space saving, simple, and efficient. Operators have total control of the process flow inside the press. Automated cleaning and minimal parts expedite maintenance. **269/673-9559; www.psirotary.com.**

FASTER DIGESTION

BIO ENERGIZER biostimulant from Probiotic Solutions accelerates the digestion of organic matter in wastewater sludge. The product is a scientific formulation of organic acids, buffers, natural biological systems, nutrients and energy systems that balance the natural microbial ecosystem. It increases the bio-oxidation of wastewater, creating a "wet burn" that reduces sludge and odor levels in wastewater treatment plants and lagoons. The product can be used to break down sludge while the lagoon stays online. Reduced sludge volume means lower mechanical handling and hauling costs. The formulation also reduces grease problems in sewer lines and lift stations. **800/961-1220; www.probiotic.com.**

MIXING SYSTEM

The **Rotamix process mixing system from Vaughan Co.** combines uniform and vertical rotation mixing assemblies to optimize solids contact. The dual-zone mixing pattern vertical-axis vortex improves volatile solids reduction, assures uniform mixing velocities, increases gas production, reduces sludge volume, and saves energy during non-peak hours. A chopper pump prevents clogging.

The system allows continued mixing until the tank is empty, and reduces maintenance by eliminating all rotating equipment within the tank. It also allows the use of a single mix pump for multiple tanks and transfer. Computational fluid dynamics analysis confirms optimum mixing performance before the installation, while process testing reaffirms an even distribution of solids once the installation is complete. **360/249-0722; www.chopperpumps.com.**

POLYMER BLENDING SYSTEMS

The **dynaBLEND pre-engineered liquid polymer blending system from Fluid Dynamics Inc.** has diaphragm metering or progressing cavity pumps. Hydrodynamic or mechanical mixing provides polymer activation technology paired to particular process and flow demands. Simple manual systems to fully instrumented PLC-based units introduce activated polymer solution from 30 to 21,000 gph. Standard or custom dry preparation systems with capacities to 2,200 pounds per day are available. **888/363-78863; www.dynablend.com.**

ONE-STEP PROCESS

Sludge Mate container filters from Flo Trend Systems dewater digester sludge, septic tank and grease trap waste, lagoon sludge, residual wastewater from manufacturing processes, sump bottoms, and industrial waste. Units, from 3 to 60 cubic yards, are permanently mounted on a tipping stand. A hydraulic cylinder raises the box and dumps the contents into a standard roll-off container. The process is controlled by a remote handheld device. **800/762-9893; www.flotrend.com.**

(continued)

Rotamix process mixing system from Vaughan Co.

dynaBLEND liquid polymer blending system from Fluid Dynamics Inc.

Sludge Mate container filters from Flo Trend Systems

Clean Edge impeller from Lightnin, an SPX brand

Solenoid valves from Magnatrol Valve Corp.

Piston pumps from Schwing Bioset Inc.

RAGLESS IMPELLER

Lightnin, an SPX brand, has a Clean Edge impeller that remains free of fibrous debris while demonstrating steady power draw and delivering the required mixing performance. **888/649-2378; www.lightninmixers.com.**

PROCESS CONTROL VALVES

Two-way stainless steel **solenoid valves from Magnatrol Valve Corp.** handle treated wastewater effluent at plants processing biosolids. Fitting 1/4- to 3-inch pipes, the valves are full port, require no differential pressure to open, and are serviced in the line. They have packless construction with continuous duty class-H high temperature coils for AC and DC voltages. The valves come normally open or normally closed with 150- and 300-pound flanged connections. **973/427-4341; www.magnatrol.com.**

BIOSOLIDS PUMP

Piston pumps from Schwing Bioset Inc. pump dewatered biosolids from 10 to 50 percent solids at 1 to 300 gpm/1,800 psi. A pressure sensor in the transition between the screw feeder and pump, and a proprietary sludge flow measuring system, automatically synchronize operations regardless of pump speed and biosolids consistency. **715/247-3433; www.schwingbioset.com.**

SLUDGE CONDITIONING

The **FTXL belt filter press from Frontier Technology Inc.** continuously dewaters using two porous belts threaded through rollers. Presses from 12 to 127 inches have a gravity sludge-conditioning zone, radial wedge section, and optimal pressure roll section. Standalone or skid-mounted units are made of 304 stainless steel. Auxiliary equipment includes nip rolls, polymerization systems, pH balancing systems, sludge infeed, and discharge with fully integrated controls. **269/673-9464; www.frontiertechnology.net.**

FTXL belt filter press from Frontier Technology Inc.

POLYMER BLENDER

The **Polyfeeder emulsion polymer blending system from Pulsafeeder Inc.** handles the diverse mixing requirements of complex emulsion polymers. Its anti-siphon, anti-clog injection lance separates the polymer from the water flow, which helps close the valve on the lance, yet allows the membrane to accommodate the occasional solid.

A clear, high-energy mixing chamber lets operators monitor the polymer blending. From there, a diminishing energy-blending cascade hydrates the molecules without damaging the extending polymer chains. The blending system has a stainless steel frame and works with solenoid, gear pump, or progressive cavity pump configurations. **585/292-8000; www.pulsafeeder.com.**

REUSING WASTE

Rectangular Square Cube heat exchangers from DDI-Heat Exchangers Inc. have compact, rectangular flow channels that minimize plugging. Sludge-to-sludge heat recovery exchangers, hot water-to-preheated sludge, and cold water-to-processed sludge heat exchangers are available. Systems using sludge-to-sludge heat recovery could see a payback in four to seven months.

The units have a large heat transfer surface, small footprint, more turbulence, 3-inch gaps to limit sludge blockage, full access to internals via doors, davit arms on swinging doors, optimum height for fast flow, realistic viscosity calculations, thick layers against abrasion (0.25- to 0.375-inch minimum), and a backup that uses the sludge-to-sludge heat exchangers for the water-to-sludge process. All are low maintenance. **514/696-7961; www.ddi-heatexchangers.com.**

Polyfeeder emulsion polymer blending system from Pulsafeeder Inc.

SKID-MOUNTED

Skid-mounted screw presses from FKC Co. Ltd. help smaller plants find simple and effective sludge dewatering solutions. The skids have a screw press, flocculation tank, control panel, sludge pump, and polymer system

Rectangular Square Cube heat exchangers from DDI-Heat Exchangers Inc.

Skid-mounted screw presses from FKC Co. Ltd.

PSX inline sludge heater from ProSonix

RoS3Q inclined screw press from Huber Technology

wired and piped for a true plug-and-play installation. The custom-designed skids dewater any type of sludge, septage, or grease trap waste. The Class A system simultaneously dewaters and pasteurizes biosolids. **360/452-9472; www.fkcscrewpress.com.**

SLUDGE HEATER

The **PSX inline sludge heater from ProSonix** has no hot surfaces, eliminating plugging and fouling. The steam, injected internally, assures rapid condensation for smooth, stable operation and complete mixing. The diffuser delivers 360 degrees of steam into the sludge for more uniform heating.

The inline sludge and slurry flow handles high volumes of solids, large particulates, and high-viscosity flows. A low liquid pressure drop of 1 to 2 psig across the heater reduces energy demand, enabling smooth integration with the pumping system. **800/849-1130; www.pro-sonix.com.**

INCLINED PRESS

The fully automatic, energy-efficient **RoS3Q inclined screw press from Huber Technology** has a slow rotating auger that handles thick, difficult sludge, producing the desired cake solids, polymer consumption, and capture rates. Intermittent wash cycles and frugal polymer dosing assure low cost of ownership. **704/949-1002; www.huber-technology.com.**

POLYMER SAVER

The **Hi-Pass sludge mixer from Komax Systems Inc.** mixes polymer solution into sludge flows before the dewatering process, resulting in polymer savings of more than 25 percent. The element is resistant to fouling or clogging, since its edges are smoothly contoured with a large radius, eliminating corners that trap solid or fibrous materials. The design passes individual solid items with a diameter of one-half the sludge mixer. The mixer is installed on the feed line to belt fiber presses, plate filter presses, gravity belt thickeners, centrifuges, and pressure or vacuum filters. **800/826-0760; www.komax.com.**

Hi-Pass sludge mixer from Komax Systems Inc.

TurboWash screenings washer from Headworks Inc.

IMPROVES PERFORMANCE

PolyClear CD5804, a cationic dry polymer from Clearbrook Inc., is a higher molecular weight, more structured product than previously offered. The free-flowing powder makes it down into solution faster with a better distribution of charge density for sludge dewatering, thickening, flotation, and clarification. **800/290-9331; www.clearbrookinc.net.**

HEADWORKS OFFERS BOD REMOVAL WASHER

The **TurboWash screenings washer from Headworks Inc.** allows biological material to be treated at the plant, not bagged as screened solids and taken to the landfill. The washer works best in cold climates, or where the collection system is a short distance from the screening process. The agitator creates a turbulent mixing zone in the channel or tank preceding the screening equipment. As wastewater enters and mixes in the turbulent zone, the agitator loosens and emulsifies the BOD material attached to the screenings, allowing soluble and fine particulates to pass through the openings and into the effluent stream. Additionally, the device intermittently runs in reverse, pushing retained solids back into the turbulent zones to dislodge more biological particles. **713/647-6667; www.headworksusa.com.**

LAKESIDE OFFERS SEPTAGE ACCEPTANCE PLANT

The self-contained, fully automated **Raptor septage acceptance plant from Lakeside Equipment Corp.** removes debris and inorganic solids passing through bar screens. A rotating rake on the heavy-duty, three-plane fine screen passes through the full depth of the basket bars, removing debris from the screening area. The rake deposits the material into the central screw conveyor hopper for washing, transport and dewatering. **630/837-5640; www.lakeside-equipment.com.** tpo

Raptor septage acceptance plant from Lakeside Equipment Corp.

people/awards

PARCC Side Clean Water Plant (wastewater) in Kent County, Mich., received the 2009 Outstanding Civil Engineering Achievement Award from the American Society of Civil Engineers.

Russell Mathers, Wilton (Maine) wastewater and water superintendent, received an Operator Award from the Department of Environmental Protection.

The Michigan Water Environment Association named the following 2009 award recipients:

- **Larry DeLong,** Arthur Sidney Bedell Award
- **Benton Harbor-St. Joseph Joint WWTP,** George W. Burke Jr. Safety Award
- **Jeff Johnston,** William D. Hatfield Award
- **Carol Injasoulian,** Laboratory Analyst Excellence Award
- **David Filipiak,** Industrial Wastewater Treatment Professional of the Year
- **Perry Thomas,** Industrial Pretreatment Program Professional of the Year
- **Dan Christian,** Chad Gamble, John Killips and Anne Thomas, James R. Rumsey Award
- **Laura Gruzwalski,** New Professional of the Year Award
- **Don Hartman,** Operations Professional of the Year Award

The Pennsylvania Water Environment Association named the following 2009 award recipients:

- **Edward L. Gillette Jr.,** Arthur Sidney Bedell Award
- **David A. Brown,** William D. Hatfield Award
- **Marykay Steinman,** Laboratory Analyst Excellence Award
- **Lehigh County Authority Wastewater Treatment Plant,** George W. Burke Jr. Safety Award, and Mark B. Hannum Plant Operations and Maintenance Excellence Award for less than 2.0 MGD, and Class II Facility Safety Award
- **Carl E. Janson,** Federation Service Award
- **Pennant Foods Hazleton Operation Wastewater Treatment Plant,** Industrial Waste Excellence Award

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

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

education

Kansas Water Environment Association

The KWEA has these courses:

- Feb. 2 – Wastewater Certification Preparation, Dodge City
- Feb. 4-5 – Wastewater Reclamation and Reuse, Hays
- Feb. 9 – Safety, Dodge City
- Feb. 9-10 – Basic Activated Sludge, Newton
- Feb. 10-11 – Advanced Wastewater Certification Preparation, Topeka
- Feb. 11-12 – Wastewater Reclamation and Reuse, Liberal
- Feb. 17-18 – Basic Electrical, Hutchinson
- Feb. 18-19 – Stormwater Management, Medicine Lodge
- Feb. 23 – Ethics, Liberal
- Feb. 26 – Small Wastewater Systems, Dodge City
- March 4-5 – Ethics, Phillipsburg
- March 10 – Small Systems Wastewater Operations, WaKeeney
- March 11-12 – Applied Math for Wastewater Operators, Hays
- March 16 – Membranes Treatment, Garden City
- March 18-19 – Natural Systems for Wastewater Treatment, Medicine Lodge
- March 24-25 – Activated Sludge Process Evaluation and Control, Garnett
- March 26 – Small Wastewater Systems, Kinsley
- March 30 – Membranes Treatment, Garden City
- March 30-31 – Plant Optimization, El Dorado
- March 31-April 1 – Biological Nutrient Removal, Lawrence

Visit www.kwea.net.

Rocky Mountain Water Environment Association

The RMWEA has an Industrial Wastewater Treatment Seminar March 25, location to be announced. Visit www.rmwea.org.

Texas Water Utilities Association

The TWUA has these courses in Waco:

- Feb. 9-11 – Basic Wastewater
- March 30 – Wastewater Collection

Visit www.twua.org.

University of Wisconsin

The University of Wisconsin Department of Engineering-Professional Development is offering the following courses in Orlando, Fla.:

- Feb. 2-3 – Upgrading Your Sanitary Sewer Maintenance Program
- Feb. 4-5 – Designing Wastewater Pumping Systems and Lift Stations

Visit http://epdweb.engr.wisc.edu.

Virginia Water Environment Association

The VWEA has a Wastewater Seminar in Charlottesville March 1. Visit www.vwea.org.

Wisconsin Department of Natural Resources

The Wisconsin DNR has these courses:

- Feb. 2 – Wastewater Math, Oconomowoc
- Feb. 3-4 – Primary Treatment – Intro and Advanced Wastewater, Green Bay
- Feb. 16 – Confined Space Entry (Wastewater), Chippewa Falls
- Feb. 18 – Cross Connection Control (Wastewater), Chippewa Falls
- Feb. 22-26 – General Wastewater Treatment, Green Bay
- March 2-3 – Wastewater Ponds – Intro and Advanced, Rhinelander
- March 9 – Spring Wastewater/Biosolids Symposium, Stevens Point
- March 9-11 – Wastewater Lab Intro, Madison
- March 17-18 – Wastewater Disinfection – Intro and Advanced, Chippewa Falls
- March 29-31 – General Wastewater Treatment, Madison

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

It's your magazine. Tell your story.
Send your news about your municipal wastewater operation to
editor@tpomag.com or call 877/953-3301

CALENDAR OF EVENTS

Jan. 31-Feb. 3
New York Water Environment Association Annual Meeting, Marriott Marquis, New York. Visit www.nywea.org.

Feb. 2-3
Iowa Water Pollution Control Association Maintenance Conference, Ankeny, Iowa. Visit www.iawpca.org.

Feb. 21-24
The Utility Management Conference, InterContinental San Francisco, San Francisco. Call 703/684-2441 or visit www.wef.org.

Feb. 24-27
Pumper & Cleaner Environmental Expo International, Kentucky Exposition Center, Louisville, Ky. Call 800/257-7222 or visit www.pumpershow.com.

March 1-3
Illinois Water Environment Association Annual Conference & Expo, Embassy Suites, East Peoria, Ill. Call 309/694-0200 or visit www.iweasite.org.

March 7-10
Cities of the Future 2010, Boston Marriott Cambridge, Boston, Mass. Call 703/684-2441 or visit www.wef.org.

March 28-30
IWA/WEF Wastewater Treatment Modeling Seminar, Chateau Mont-Sainte-Anne, Quebec, Canada. Visit www.wef.org.

Rewards of Competition

THE ANNUAL WEF OPERATIONS CHALLENGE DEMANDS ENERGY AND COMMITMENT — AND GIVES BACK ABUNDANTLY IN TEAM BUILDING AND PROFESSIONAL GROWTH

By Ted J. Rulseh

It's as close to a sporting event as anything you'll find in the environmental service profession. The Water Environment Federation's annual Operations Challenge seems to draw more attention each year.

And believers will tell you it means a great deal more than wholesome competition and bragging rights. Those who take part each year benefit by learning how to be better teammates and by developing skills that can help them advance to higher levels and more responsibility in their organizations.

The competition includes five events in which teams of four (led by a coach) race against time to complete a detailed series of tasks. The events tests teams' mettle in collection systems, laboratory, process control, maintenance, and safety.

To get perspectives on the Operations Challenge, *Treatment Plant Operator* interviewed Steve Harrison, project manager in the Public Communications department of WEF, and John Hart, chief operator at the Saco (Maine) Wastewater Treatment Plant, and a former Challenge participant, judge, and event committee chairman.

tpo: How do the Operations Challenge events change from year to year?

Harrison: The events evolve so that, typically, one event is new each year. Right now, we are reworking the maintenance event for the 2010 competition. We are partnering with WILO-USA LLC to prepare an event using a Model FA10.33 pump and TR50-2 mixer.

Creating an event from the ground up takes an incredible amount of work. The event coordinator collaborates with representatives from the manufacturer. We come up with a task summary, vet it, review it, and revise it. Then we prepare a task summary that gets released in our rules and regulations for the event.

tpo: What happens in the months leading up to the event finals at WEFTEC?

Harrison: Local competitions at the Member Associations start in March and continue through June. Event information, including the rulebook, goes up on the WEFTEC Web site by end of January. On March 1, a copy of the rulebook goes out to anybody who wants one. All the teams that qualify for the WEFTEC event get a final rulebook on September 1.

One thing the local competitions allow us to do is refine our new event. We release a draft of the event, and the local competitions provide a kind of peer review process. Teams run through the event, and the judges and volunteers are able to observe and suggest changes and improvements. We then update the event throughout the year and end up with a better event for the WEFTEC competition in the fall.

Steve Harrison

John Hart

tpo: What does it take each year to put on an event of such broad scope and complexity?

Harrison: With judges and event coordinators and others working behind the scenes, we have at least 100 volunteers on site for the WEFTEC event. Regionally, it radiates from there. With 40 teams at five members per team, that's 200 people actually competing at WEFTEC, but between the volunteers and sponsors at the Member Association level, there are thousands of people who got them there.

> Whatever you put into it, you gain much more back. The part I like about it is that you're actually working on your own personal and professional development ... I've seen many people who have competed over a few years' time move up into significant leadership roles.
>
> **JOHN HART**

Hart: It takes a large group of people to run all those local events, and many of the teams that compete locally don't even go on to the nationals. It's a multiplication factor — a huge family tree that goes everywhere.

tpo: How are the Challenge teams put together, and how do they qualify for the finals at WEFTEC?

Harrison: Typically, the Member Associations have a competition, and the first and maybe second place teams go on to WEFTEC. Associations are limited in the teams they can send by the number of members they have in the WEF House of Delegates.

Some Member Associations assemble teams from operators who win their annual awards, as a kind of reward for their proficiency. I think that's a terrific way to put a team together, although those teams can be at a competitive disadvantage at WEFTEC, because they may not have as much opportunity to practice together.

Hart: A lot depends on the municipality and the level of support it provides. A large municipality, for example, might be able to support an entire team. In some regions, including New England, you might have a team made up of members from different plants within a region of a state. In the teams I was on, we were spread all up and down the state of Maine. I can remember driving two hours each week to practice.

tpo: How do teams go about practicing for the Challenge? How do they get access to the equipment used in the events?

Hart: Teams can't always get a piece of equipment to practice on. Sometimes they know a vendor willing to loan a piece of equipment. In other cases, teams have to be creative enough to simulate. I know of teams that have practiced for the confined-space safety event using a block of wood with buttons on it for a gas meter.

Harrison: This is one reason we created two divisions for the WEFTEC event. There are well-funded teams from big utilities that can procure and practice with the equipment to be used in the actual event, and then there are teams from smaller utilities and smaller Member Associations who have to be very creative.

tpo: What kind of time commitment do Challenge teams have to make?

Hart: In New England, our local competition is in June. We would be practicing by April, maybe once a week for a couple of hours at a time. Teams practice by going through every step of the events and trying to get it down to a science. It's an intricate process — a choreographed routine where every second and every step counts. Those teams that practice, practice, practice, typically come out on top.

tpo: How do teams and operators become interested in the Challenge?

Harrison: It can be quite daunting to get involved for the first time. I know I would be intimidated by seeing a team rescue a mannequin from a confined space in less than three minutes. A team or utility may not have the resources to compete in all five events right away. So some may start out by doing one or two of the events. Then as their volunteer base grows and the team members' knowledge increases, they can work up to full-fledged competition. It's a gentle introduction to a highly complex event.

Hart: In New England, we have a training day where we try to attract new teams. It's designed for teams with a sincere desire to compete, but also for individual operators who wonder what it's all about. We try to have most of the equipment on hand that will be used at the nationals.

It's a chance to look at and touch the equipment and get a feel for each event. If anything, it plants the seed. We may not see a given person in the Challenge that same year, but maybe a year or two down the road, we will see them.

We let operators know that by attending the training day, they can earn training contact hours toward license renewal. Of course, those who actually get involved in the Operations Challenge will far exceed their training contact requirements.

tpo: Is WEF considering expansion of the Challenge?

Harrison: We have capped the WEFTEC competition at 40 teams for some time now — it's all we can do to get 40 teams through all five events in two days. However, in the past several years, we have included 41 or 42 teams, simply because we don't want to turn qualified teams away. We are looking eventually to expand the field to 44 teams.

tpo: How would you describe the benefits participants get from the Operations Challenge?

Hart: Whatever you put into it, you gain much more back. The part I like is that you're actually working on your own personal and professional development. It's a great experience for someone who wants to move up into a supervisory role. You learn a lot about communication and teamwork. If one person isn't working with the team, things just don't happen.

Every team member trains on the full variety of events, and that makes them more well-rounded professionals. It gets them out of their comfort zones, making decisions and playing roles where they typically wouldn't be involved in daily work life. For example, a lab person learns about the mechanical side of operations, and a mechanic learns to deal with process control and lab work. It gives every team member an appreciation of the other members' roles.

I've seen many people who have competed over a few years' time move up into significant leadership roles, like becoming president of a Member Association, or getting promoted to plant superintendent. Just competing at the national level takes you to WEFTEC, where you see things and meet people from literally around the world.

Harrison: There are lots of ways to benefit from the Challenge, and winning shouldn't be the only focus of it. Year after year, I see operators who maybe were working at a treatment plant because a cousin worked there — they just sort of ended up there. Then they get involved in the Operations Challenge, and they really begin to grow. They become aware that they are water-quality professionals. They come to appreciate the industry they're involved in. I see that all the time.

TRIAL BY FIRE

Since 1988, the Water Environment Federation's annual Operations Challenge has matched some of the nation's best operators in an intense team competition. Each team is sponsored by a WEF Member Association or a recognized Operator Association.

Winners are determined by a weighted point system for five events: collection systems, laboratory, process control, maintenance, and safety. Each event is designed to test the diverse skills required in the wastewater treatment profession.

For wastewater treatment agencies that want to enter teams, or for operators who want to find out more about the event, now is the time to get busy. The 2010 Operations Challenge officially starts in March with regional events, and it culminates with the international competition at WEFTEC 2010 in New Orleans, Oct. 2-6.

You can find information at www.weftec.org.

> If you want to excel in this industry, why wouldn't you get involved in an activity that includes the best water-quality professionals from all over the continent?
>
> **STEVE HARRISON**

tpo: How has the Operations Challenge helped you personally?

Hart: It has really accelerated my growth and development. It allowed me to learn things I might not have learned otherwise as a small-town wastewater operator. I worked my way up through the hierarchy in the Operations Challenge and got more involved in WEF at the regional level. I kept stepping up to the point where I just completed a three-year tour as a Delegate-At-Large for the WEF.

I can't tell you how much payback I get just from the networking opportunities the Challenge creates. If I have a question or a problem, I can work with people I've met through the Challenge. I can call someone and say, 'What are you doing in Virginia, or California, or Texas?' It enhances the brotherhood and sisterhood of operators.

tpo: What advice would you give to an operator considering joining a team and taking part in the Challenge?

Hart: Don't be afraid. Just get involved. It's a tremendous opportunity, and an awesome experience, and you're going to meet a lot of great people.

Harrison: If you want to excel in this industry, why wouldn't you get involved in an activity that includes the best water-quality professionals from all over the continent?

These are people who want to excel. Unfortunately, in this business, the usual reward for proficiency is anonymity. The only time you hear about the business in the general media is when something goes wrong. It's great to have a venue where these devoted people can be recognized for the outstanding way they perform a crucial job. tpo

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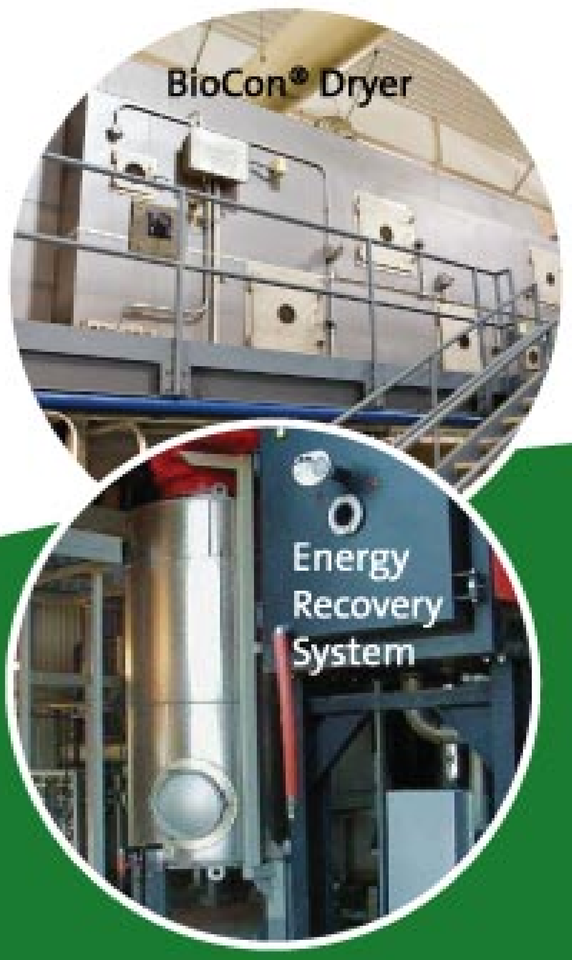

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