TREATMENT PLANT OPERATOR

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DEDICATED TO MUNICIPAL WASTEWATER PROFESSIONALS

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JANUARY 2009

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Operations Is King

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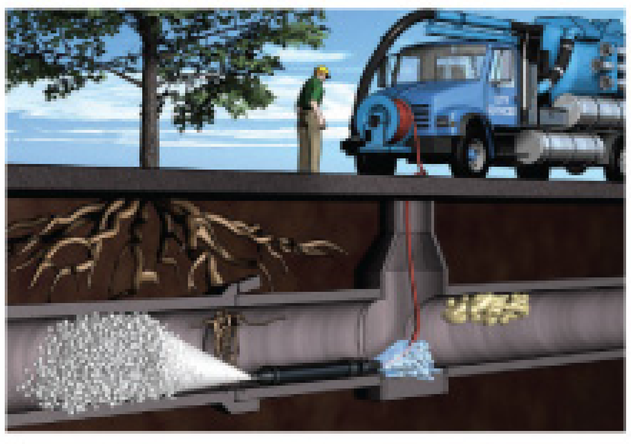

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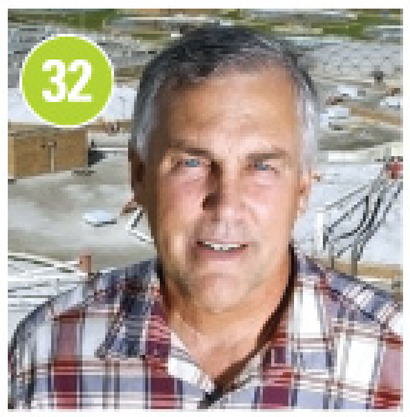

departments

on the cover

The operations staff of the Sanitation Districts of Los Angeles County prides itself on innovation, from out-of-the-box ideas to improve treatment plant performance, to quick response in emergencies. Team members include from left (standing), Greg Osburne, Eric Robbins, Christopher Argo, Jeanine Phaneuf and Christopher Argo; and (kneeling), James Carpenter and James Taylor. (Photography by Patrick Botz-Forbes)

advertiser index

tpo TREATMENT PLANT OPERATOR

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It's Your Magazine. Tell Your Story.

TREATMENT PLANT OPERATOR PROVIDES A FORUM FOR WASTEWATER PROFESSIONALS TO CELEBRATE SUCCESSES, SHARE BEST PRACTICES, AND IMPROVE THE CRAFT

By Ted J. Rulseh, Editor

I've been involved with wastewater treatment in some way for almost 25 years. My main observation is that it's an industry filled with incredible people.

I had my first complete treatment plant tour in 1984, as a consultant on a community relations project with the Milwaukee Metropolitan Sewerage District. I went with some trepidation to the Jones Island treatment plant, which is down in the city's industrial valley, not the most appealing part of town.

As I walked into the plant manager's office I was surprised by the expansive windows that overlooked the property. When I introduced myself, the manager, Frank Munsey, gave a firm handshake and said, "Welcome to our plant. We're proud of it."

(Proud of it. Hmmm. At the time it struck me as odd that a sewage plant could inspire pride. But that was then.)

PRIDE ON DISPLAY

After giving me a brief rundown on the plant, Munsey turned me over to a supervisor, Jeff Potrykus, who took me to all the points of interest, including the area where they processed and dried waste activated sludge (all right, biosolids) to make the nationally known fertilizer, Milorganite.

I remember none of the facts and figures that Potrykus surely shared with me. I do remember, and won't forget, his attitude. He was an evangelist for his profession. "Do you know how important this plant is?" he asked as we stood overlooking a row of bubbling aeration basins. "If this plant were to fail, there would be a cholera epidemic that could devastate this city."

At each stop, Potrykus shared factoids and anecdotes that brought the plant to life. At one point, he looked me in the eye, shook his head, and said, "I *love* this business."

(Love this business? Sure, why not? By that time, I "got it.")

UNSUNG HEROES

Since then I have written brochures for a biosolids man-

agement company and trade press articles and Web sites for water treatment equipment firms. I've toured more treatment plants photographing engine generators in digester-gas-to-energy systems. And I've written about onsite wastewater treatment, collection system maintenance, and other topics for COLE Publishing, which brings you this magazine.

Almost without exception, I have met people who are incredibly dedicated and extremely capable, and who get nowhere near the recognition and appreciation they deserve. Now I have the privilege to edit a magazine for those people — for all of you who stand on the front lines of keeping the waterways clean.

Almost without exception, I have met people who are incredibly dedicated and extremely capable, and who get nowhere near the recognition and appreciation they deserve. Now I have the privilege to edit a magazine for those people — for all of you who stand on the front lines of keeping the waterways clean.

Treatment Plant Operator is dedicated to information that helps managers and operators at municipal clean-water plants meet permit obligations, achieve performance excellence, progress in their careers, share information and celebrate accomplishments.

It's about the tools and technologies, yes, but first and foremost it's about and for the people in the treatment business.

In other words, it's your magazine. Our mission is to help you do the best job you can by learning from others in plants just like yours. Of course, that also means you can share your successes, so that others can learn from your example.

MAKE IT YOUR OWN

So here's the offer: Tell us what you're doing that makes you proud. Have you discovered a technology or operating practice that improves plant performance, reduces costs or conserves energy?

What programs do you have to keep the public informed and on your side? Do you take special measures to keep your grounds beautiful or to make your site friendly to wildlife? What have you done lately to make your operations more green?

Have people in your facility earned promotions? Won awards? Reached milestones in years of service? Does a member of your operating team stand out as someone who deserves recognition in the industry? What's going on in your state or regional operator association or WEF affiliate?

Whatever you're doing that's excellent and would interest others in the business, we'd like to hear about it. Send me a note to editor@tpomag.com and I will get back to you promptly. In the meantime, feel free to visit our Web site at www.tpomag.com.

COLE Publishing is honored to serve the wastewater treatment industry. My colleagues and I hope things you learn on these pages help you gain even more satisfaction from your work and give you more reasons to say, "I love this business." tpo

Starting Them Young

AN INNOVATIVE SUMMER PROGRAM IN CENTRAL FLORIDA INTRODUCES SCHOOL CHILDREN TO OPPORTUNITIES FOR CAREERS IN WASTEWATER TREATMENT

By Scottie Dayton

Many wastewater treatment operators in the Haines City (Fla.) Water and Wastewater Division are approaching retirement, and the negative connotation that goes with "sewage" makes finding replacements difficult.

But Troy Cassidy, division superintendent, has a long-range solution. He envisioned teaching children ages 8 to 12 about opportunities in the profession by showing them the options.

Cassidy developed a free two-day Kids Science & Water Workshop, then advertised it in the newspaper. Parents picked up applications at the treatment plant or received them by fax. Held last June and July, the two workshops each attracted 10 boys and two girls from four different schools.

DAY ONE

"A small class is easier to train, and 12 students are ideal because of our space limitations," says Cassidy, who began the first morning with three videos to acquaint the youngsters with different water issues.

Water's Journey, from the American Water Works Association (AWWA), illustrates how lake water, wastewater and drinking water are tied together. Cassidy fast-forwarded through sections too technical for his audience.

Water 101, from the South West Florida Water Management District (SWFWMD), is an overview of water resources, and *Science Court* is a cartoon about the water cycle from AWWA.

Before they toured the treatment plant, Cassidy gave the students notebooks and pencils, then told them what to write as he explained the equipment and its functions.

"When we reached the headworks, most were ready to leave really quick, but two boys were very curious and weren't bothered by the smell," says Cassidy. "They definitely might be future wastewater operators."

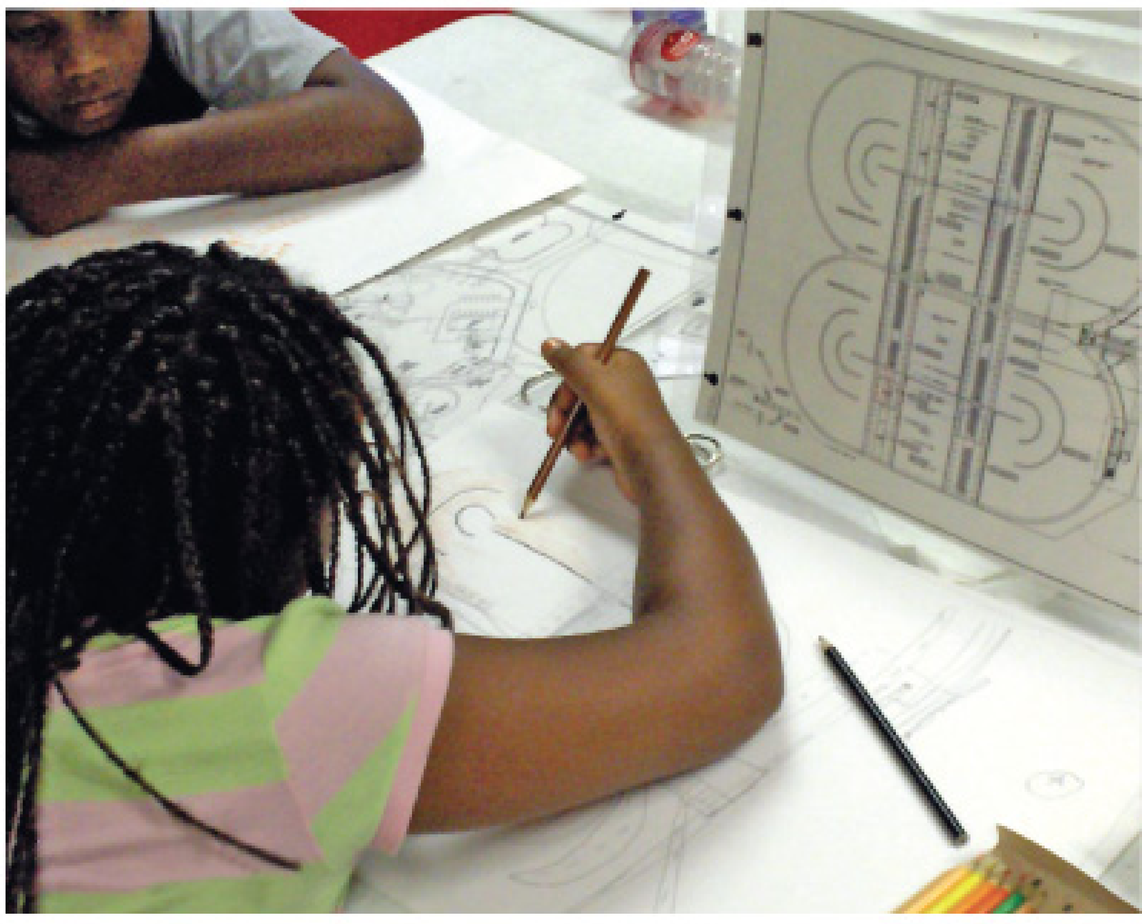
One clarifier was offline for repairs, enabling the students to look inside to see how the tank worked, then compare it to the tank still operating.

"A small class is easier to train, and 12 students are ideal because of our space limitations."
TROY CASSIDY

LOOKING OVER THE LAB

In the laboratory, Cassidy and operator Hardy Harrell did a mixed liquor test, running a settleometer and centrifuge on the samples, preparing slides and letting the youngsters look through microscopes at the microorganisms. After receiving gloves and goggles, the students ran pH and chlorine residual tests. "You want to have enough lab equipment so the kids can run various tests simultaneously," says Cassidy. "The more hands-on stuff for them, the better."

After lunch (meals and snacks for morning and afternoon breaks were included), Cassidy taught the students the basics of how to read blueprints, then asked them to find various components, such as the aeration tank floor slab and the electrical wiring for the maintenance room. After acquainting them with some symbols and how tanks were color-coded, he instructed them to design their own plants.



PHOTOS COURTESY OF THE HAINES CITY WATER AND WASTEWATER DIVISION

After getting acquainted with plant operations, workshop students were asked to design their own facility.

"The drawings had to include stairways, aeration and clarifier tanks, a contact chamber, and the direction of the flow," says Cassidy. "Some students followed directions very well, while others were kind of out there."

Chastain-Skillman Inc., a consulting firm in Lakeland, Fla., provided drawing equipment kits, which the students were allowed to keep. Judges of the drawings were Class B wastewater operator Elvin Whitfield, Class C wastewater operators Ken Coaty and Aaron Kniep, and operator trainees Romeo Nevers and Walner Lanoix.

FIELD TRIP

When the parents brought their children for the second day, they told Cassidy the youngsters had talked nonstop about their experiences and were looking forward to returning. Before leaving on their field trip, Cassidy gave the students small fanny packs filled with pencils, erasers, Earth Squeeze balls and a water bottle. He also distributed kits from SWFWMD to measure dissolved oxygen, turbidity, pH and temperature.

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.

Cassidy and maintenance man Lee Strickland transported the children to two city parks, where they tested water samples drawn from large ponds. "We paired the kids into groups of four and told them where to approach the water," says Cassidy, who gave them many points to write in their notebooks.

After lunch at the treatment plant, Cassidy took the students through the Water Division. He explained how water entered the facility, showed them the 1,000-foot-deep wells, and described the color codes for piping. "Next time, I want the kids to participate in well draw-downs, too," he says.

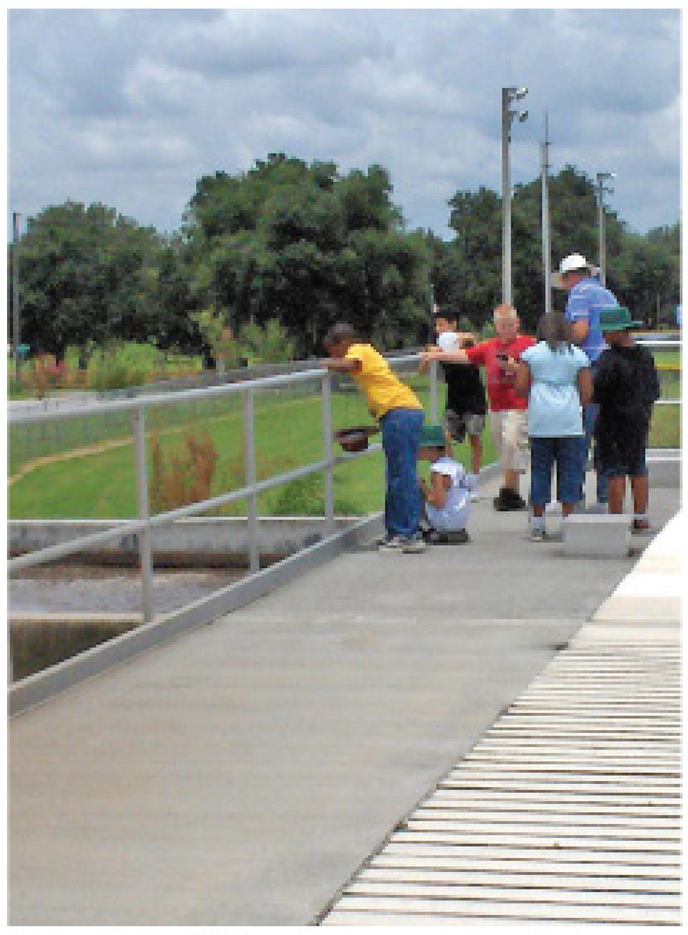
> "The drawings had to include stairways, aeration and clarifier tanks, a contact chamber, and the direction of the flow. Some students followed directions very well, while others were kind of out there."
>
> **TROY CASSIDY**

The workshop closed with Cassidy giving the students computer training on the treatment plant's SCADA system. "I want to split the group in half next time and have one do computer training while the other is testing in the lab," he says.

BEST OF THE REST

An award ceremony followed. The three best treatment plant drawings received gold, silver and bronze medals. Cassidy then told the kids to open their notebooks and asked them questions based on what he had told them to write down. The three best performers in that exercise received medals.

After that, Cassidy asked each child to tell him one thing he or she learned from the workshop. He congratulated those with the best answers and gave an additional award. "The purpose was to impress on them the importance of paying attention and following instructions, because that is how the workplace functions," explains Cassidy.



Participating kids got a tour of the plant, plus school supplies, a water-testing kit and a fanny pack. They also went to local parks to take water samples.

The students received attendance certificates stamped with the Haines City seal and signed by Cassidy and public works director Ronnie Cotton. Each child also received a workbook with puzzles, drawings, word trivia and information to use in a future school science project. The day concluded with Cassidy taking the youngsters to Dairy Queen as a reward for behaving throughout the field trip. tpo

Knowledge on Board

AN EXPERIENCED AND COMMITTED STAFF IS KEY TO MULTIPLE-AWARD-WINNING PERFORMANCE AT THE WRIGHT SMITH JR. TREATMENT PLANT IN MOBILE, ALA.

By Ted J. Rulseh

Wallace Bettis (left) and Roger Carlisle install a surge protector on a flow meter. (Photography by Lyle Ratliff)

THE LEAST EXPERIENCED OPERATOR

at the Wright Smith Jr. Wastewater Treatment Plant in Mobile, Ala., has been on the job for 17 years.

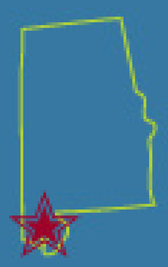
Plant manager Mike Knapp will tell you that's a key reason the plant routinely outperforms its permit requirements and receives performance awards. It's also a reason residents of Mobile and its surroundings can rest easy with confidence that water resources are being well-protected.

The Wright Smith plant, which serves the north side of Mobile as part of Mobile Area Water & Sewer System (MAWSS), earned 2007 and 2008 Best Operated Plant Awards from the Alabama Water & Pollution Control Association and has won several Plant Excellence awards from the Alabama Water Environment Association.

It also earned a 2007 Platinum Peak Performance Award from the National Association of Clean Water Agencies for five consecutive years of 100 percent NPDES permit compliance. The plant often achieves an annual average of 95 percent reductions in BOD and

profile

Wright Smith Jr. Wastewater Treatment Plant



OWNER:	Mobile (Ala.) Area Water & Sewer System
BUILT:	1948 (upgraded 1964 and 1986)
TREATMENT LEVEL:	Secondary
TREATMENT PROCESS:	Trickling filter
FLOWS:	Design 12.8 mgd, average 10.5 mgd, peak 30 mgd
PERMIT LIMITS:	20/30 BOD, 30/45 TSS, 5/7.5 ppm ammonia, 5.0 mg/l DO
RECEIVING WATER:	Three Mile Creek (tributary to Mobile River)
PLANT MANAGER:	Mike Knapp, TPO III
OPERATORS:	Roger Carlisle, TPO II, 31 years; Irvin Ely, TPO II, 32 years; Robert Hendricks, TPO II, 28 years; Wallace Bettis, TPO I, 28 years; Marc Renfro, TPO I, 17 years; Jeffrey Rester, TPO I, 19 years; Anthony Stewart, TPO I, 25 years; William Vaughn, TPO I, 26 years. (Jimmy Wiggins, chief treatment plant operator, retired in May 2008 after 25 years.)
WEB SITE:	www.mawss.com

The Wright Smith treatment plant was built in 1948 with primary treatment and has been steadily upgraded since, most recently with the addition of a SCADA system in 2003.

TSS, far better than its NPDES permit requires.

It's all thanks to experienced personnel, helped by technology that includes a supervisory control and data acquisition (SCADA) system that enables real-time monitoring and automated control of critical plant functions.

"The engineers have given us a well-designed and very forgiving plant," says Knapp, who has been with MAWSS for 31 years, the last eight as Wright Smith plant manager. "We have a great bunch of operators — I can't say enough about them. And we have a board of directors and management that see fit to give us the tools we need to do our jobs well."

WORKING WET

The two MAWSS treatment plants have to be flexible because of wet weather on the Gulf Coast. Mobile averages about 67 inches of rainfall per year. "One year we may lead the nation in rainfall, and the next year it might be Seattle," says Knapp. "We're always in the top five cities in the States for rainfall."

Of course, heavy rains mean increased inflow and infiltration, which despite significant efforts at mitigation drives up flows, from an average of 10.5 mgd to a peak of 30 mgd. The plant's high-rate trickling filter technology handles the flow variations. "We can take 8 mgd today, 30 mgd tomorrow, and back to 8 mgd the next day and still meet our permit conditions," Knapp says.

The plant was built with primary treatment in 1948. An upgrade in 1964 added two trickling filters and a digester, and a 1986 upgrade added two nitrification trickling filters to meet new ammonia limits in the permit, new final clarifiers, and another digester. The SCADA system was added in 2003.

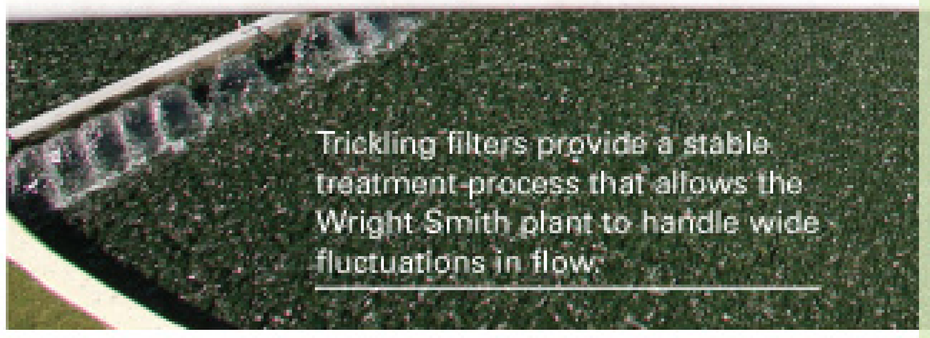
Knapp runs the plant with eight operators, all certified by the Alabama Department of Environmental Management (ADEM). The whole team buys into Knapp's philosophy that the job means more than meeting the permit.

"For years and years, wastewater treatment was out of sight and out of mind," Knapp says. "Now, it's in the front light. Our operators are environmentalists at heart. I don't see how you can work as many years as we have in this organization without becoming an environmentalist.

"Our permit specifies 85 percent removal of BOD and TSS," he notes. "We pride ourselves on getting to 95 percent or more in a given month. We want to achieve better than what ADEM or EPA says because this is our environment. This is the community we live in."

"Our operators are environmentalists at heart. I don't see how you can work as many years as we have in this organization without becoming an environmentalist."
MIKE KNAPP

From left, Wright Smith employees Roger Carlisle, A.E. "Eddie" Stewart, William Vaughn and Mike Knapp, plant manager.



Trickling filters provide a stable treatment process that allows the Wright Smith plant to handle wide fluctuations in flow.

LETTING PEOPLE WORK

Knapp praises MAWSS for a quality management group that provides competitive salary and benefits and empowers good people to do their jobs. He notes that managers take notice when the plant does well, recognizing the team at board meetings and providing special lunches for achievements such as plant performance awards.

In turn, Knapp tries to provide quality management of his own. "I believe in letting a man do his job," he says. "When you have a crew as mature as what we have here, there's not a whole lot of management that has to be done. They know what their job is. They go out and do it.

"I believe first of all that you need to let people know what you expect of them," Knapp says. "Then give them the tools to do it, and give them the freedom to do it their way. I don't like to manage with a strong arm. I like to give the guys the flexibility to see what their way is, because a lot of times their way will be better than my way. If they have an idea on how to achieve something that helps us save time and money, I'm all for it."

His approach is often rewarded. As one example, operator Billy Vaughn approached Knapp with an idea he thought could reduce chlorine feed. Vaughn had been observing effluent fecal coliform trends and had determined that the feed rate could be reduced in cooler weather while keeping the coliform count below the required level. "I let him take the ball and run with it, and he was able to cut our chemical usage by 10 to 15 percent," Knapp says.

A good work environment has contributed to staff longevity, observes Barbara Shaw, MAWSS public affairs manager. Employees are eligible for retirement after 25 years of service, yet six members of the staff have been on the job at least that long. "It's a credit to Mike that so many have stayed on," Shaw says.

A TOP-PERFORMING ORGANIZATION

Excellent performance is the rule, not the exception, at Mobile Area Water & Sewer System, which serves 234 square miles and has 88,000 water and wastewater accounts covering all of the city of Mobile and parts of Mobile County. Like the Wright Smith treatment plant, the Clifton C. Williams Wastewater Treatment Plant in Mobile has earned multiple awards.

This plant, built in 1957 and upgraded in 1977 and 2000, serves the downtown area and other parts of the city. It has a design capacity of 28 mgd, average flow of 21.5 mgd, and peak flow of 41.7 mgd. The plant is a high-purity oxygen-activated sludge facility discharging to the Mobile River.

In 2005, the plant received the Platinum Peak Performance Award from the National Association of Clean Water Agencies for five consecutive years of perfect NPDES permit compliance. In 2006, it was named the Best Operated Plant in Alabama in its size category (10 mgd and up) by the Alabama Water Pollution Control Association — its fourth such honor in five years.

The Williams facility also received the 2008 Plant Excellence in Municipal Wastewater Treatment Award for plants with above 10 mgd from the Alabama Water Environment Association.

Meanwhile, in 2007, MAWSS people and facilities racked up more than a dozen environmental awards including:

National Association of Clean Water Agencies:

- Platinum Peak Performance Awards, Wright Smith Jr. WWTP and Clifton C. Williams WWTP.
- Gold Peak Performance Award, Wright Smith Jr. WWTP.

Alabama Water and Pollution Control Association:

- Charles W. White Award, John Sullivan, treatment plant operator III, for outstanding service to the water supply industry.
- Bolton, Crockett, Beck Award, Jimmy Wiggins, chief treatment plant operator, for outstanding contributions in the water and pollution control industry.
- Best Operated Plant (10+ mgd), Clifton C. Williams WWTP.
- Best Operated Plant (Trickling Filter), Wright Smith Jr. WWTP.
- Best Operated Plant in the State, three consecutive years, Clifton C. Williams WWTP. Best Operated Plant (6,000+ meters), MAWSS distribution system.
- Award of Excellence, E.M. Stickney Water Filtration Plant.
- Award of Excellence, H.E. Myers Water Filtration Plant.

Alabama Water Environment Association:

- Plant Excellence Award, Wright Smith Jr. WWTP.
- Lifetime Achievement Award, Malcolm Steeves, MAWSS Director.

EMBRACING TECHNOLOGY

Long experience and established habits have not kept the Wright Smith team from embracing technology, notably the SCADA system. "The operators adapted very well," says Knapp. "I did see some reluctance at the beginning, but the longer they've used it, the more confidence they've built in it.

"It's important to spend a percentage of your time out in the field. Nothing takes the place of that," Knapp says. "But you don't have to be out in the field to do everything. The SCADA system saves us a lot of footsteps and time and enables us to look at real-time data, instead of data that may be two, three, four or five days old."

SCADA lets the team monitor the primary pump stations and increase and decrease the pumping rate as needed. It also enables them to maintain flow to the trickling filters for the optimum hydraulic and biological loading.

"Previously, we would make physical adjusts, then go back in three hours and find that conditions had changed considerably," Knapp says. "With SCADA, we can observe flow in real time and make adjustments just by entering a setpoint. We're able to monitor DO and turn another aerator on, or turn an aerator off as needed, while sitting in the control center."

The staff's confidence in the technology became clear one cold, rainy Saturday night, when SCADA information told operator Eddie Stewart that plant flow was below expectations. Stewart deduced that a major interceptor must be blocked, and so phoned the supervisor and manager on call, getting them out of bed.

A crew sent into the field found a surcharged manhole. A bypass pumping setup solved the immediate problem; a camera inspection ultimately showed that a pipe lining had separated from the concrete pipe and was catching debris that blocked the flow.

"Actions like Eddie's are just an everyday occurrence with the type of crew I have," Knapp says. "You get to where you almost expect that kind of excellent operation.

"Between the SCADA system and Eddie being on his toes, we were able to save MAWSS from a costly overflow. Without SCADA, he wouldn't have been able see the instantaneous flow data."

MEETING THE CHALLENGE

As smoothly as things run at the Wright Smith plant, challenges remain. Budgeting has become difficult with rising prices for commodities, especially fuel and electricity. Both are up more than 100 percent for 2008 versus the previous year.

"We've got to pay the electric bill and the gas bill before we can buy new equipment, hire new employees, and train people," Knapp says. "Money is definitely a challenge. So is keeping these operators who are eligible to retire — making it so they want to stay on. Over the next few years, it will be a challenge to bring some new people into the organization and get them trained and up to speed."

> "We want our grandkids and great-grandkids to be able to swim in these creeks around here. We want to be able to eat shellfish out of Mobile Bay. I'd like to see the day come where we have uses for all the effluent from this plant."
> **MIKE KNAPP**

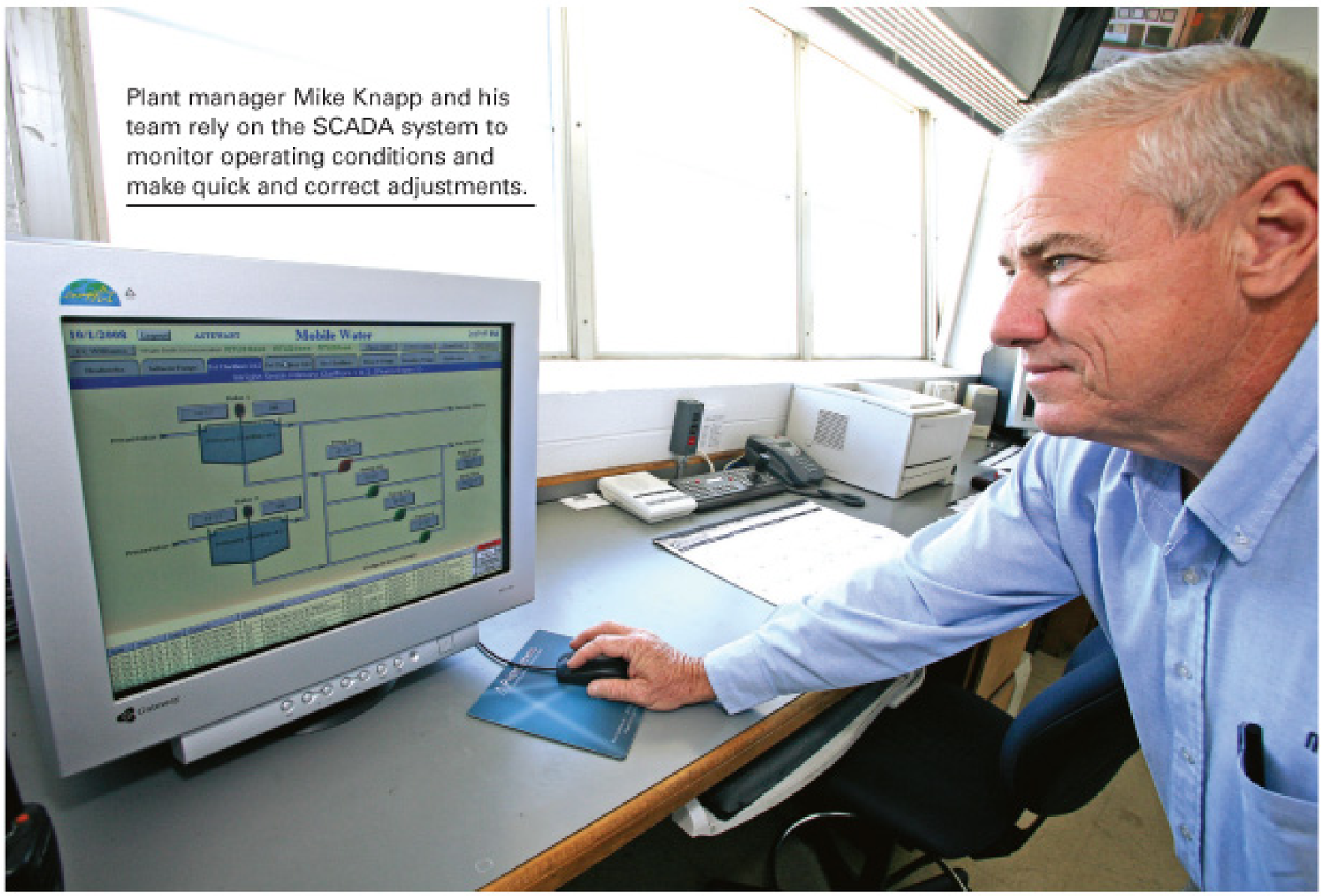
Perhaps the biggest challenge is preparing for a new NPDES permit. The current permit expires in August 2009, and Knapp expects the new one to include limits on phosphorus discharges.

"It's one thing to operate under the permit conditions you have," says Knapp. "When you look ahead to renewing your permit, you know your numbers are going to go down, and you need to start looking today at getting them down."

That comes naturally for a plant crew that takes its clean-water responsibilities to heart. "We want our grandkids and great-grandkids to be able to swim in these creeks around here," Knapp says. "We want to be able to eat shellfish out of Mobile Bay. I'd like to see the day come where we have uses for all the effluent from this plant." tpo

Effluent from the Wright Smith plant consistently outperforms the effluent requirements in its permit.

Plant manager Mike Knapp and his team rely on the SCADA system to monitor operating conditions and make quick and correct adjustments.



Bioscience Relocates Headquarters, Manufacturing Facilities

Bioscience Inc., a supplier of biological products for wastewater treatment and spill cleanup, has moved its headquarters and manufacturing operations from Bethlehem, Pa., to a new 11,000-square-foot facility at 966 Postal Rd. in Allentown, Pa. The move enables the company to enhance its production capacity and improve manufacturing efficiency through the use of automated equipment as well as expand its research laboratories.

Hydro International Acquires Eutek Systems

Hydro International, a supplier of environmentally sustainable products and solutions for the control and treatment of stormwater, wastewater and combined sewer overflows, has acquired Eutek Systems Inc. for $8.5 million and additional payouts of up to $5 million over five years. Hydro plans to maintain the Eutek brand and use the company's Portland, Ore., base as a platform to expand its U.S. wastewater business. The combined business has annual revenues of approximately $60 million.

Washington State Approves Hydro's Up-Flo Filter

The Washington State Department of Ecology has approved Hydro International's Up-Flo filter for pilot use in the stand-alone treatment of stormwater flows. Designed to remove trash, sediments, nutrients, metals and hydrocarbons from stormwater runoff, the filter is approved to treat flow rates of 22.7 gpm per square foot of filter surface area. Four different media types also have been approved, including sand, perlite and Hydro's CPZ and CPS mix.

Envista Embarks on Infrastructure Project

Envista Corp., a provider of Web-based software for infrastructure coordination, has reached agreement with six cities and utilities in Rhode Island for a pilot program that utilizes the company's resources to optimize planning. The cities of Providence, Cranston and Pawtucket along with the Providence Water Supply Board, Narragansett Bay Commission and Veolia Water North America are planning various water, sewer and road infrastructure projects that will affect nearly 750,000 residents and more than 10,000 businesses. All of the entities manage infrastructure systems located within the public right of way, and in most cases, the facilities lie under roadways. The project will enable the cities and utilities to coordinate service and replacement projects with other organizations that use the right of way, resulting in construction cost savings and less disruption for residents.

Muffin Monster Marks 35th Anniversary

The Muffin Monster wastewater grinder from JWC Environmental marked its 35th anniversary in 2008. In 1973, Woodie and his father, Joseph Chambers Sr., produced the first grinder in their garage. They have since added 15 new Monster products and won numerous innovation and technology awards. The company's Santa Ana, Calif., manufacturing site also has been accepted into the Underwriters Laboratories Directory of Registered Firms in compliance with ISO 9001:2000, certificate number A16182. As part of its certification, JWC is required to pass regular audits of its quality assurance program.

North Dakota Power Plants Utilize Romtec Lift Stations

Romtec Utilities' pre-engineered lift stations with ITT Flygt submersible pumps are being utilized in two new 95-megawatt Basin Electric Power Cooperative electrical generation plants near Groton, N.D. The pumps collect and move process water to a retention pond on site. Each pump system includes a precast concrete wet well (6 inches in diameter and 13 inches deep), along with preassembled piping and valves and electrical controls that interface with the plant's supervisory control and data acquisition (SCADA) system.

Viking Pump Redesigns Web Site

Viking Pump's redesigned Web site, www.vikingpump.com, features an enhanced literature section, new engineering resources and 3-D pump models in PDF/IGES/STEP/SAT formats.

Q^2 Technologies Acquires Adapco Environmental

Q^2 Technologies LLC has acquired the assets of Adapco Environmental Solutions. As part of the transaction, Q^2 acquired AES's odor control scrubber patents and Vulchur line of industrial and municipal products, which will be expanded to include new Q^2 offerings. The former AES operation will become the Environmental Solutions Division within the Q^2 organization, providing technical support and service to the existing AES customer bases. Ian Knapp has been appointed vice president of the new division.

Penn Valley Pump Receives Water Quality Award

Penn Valley Pump Co. of Warrington, Pa., received the Innovative Technology Award from the Water Environment Federation. The award is presented annually to WEF associate members that have introduced innovative products or services related to construction, operation or maintenance of treatment facilities. Penn Valley Pump was recognized in the solids handling and disposal category for its Double Disc Pump technology. tpo

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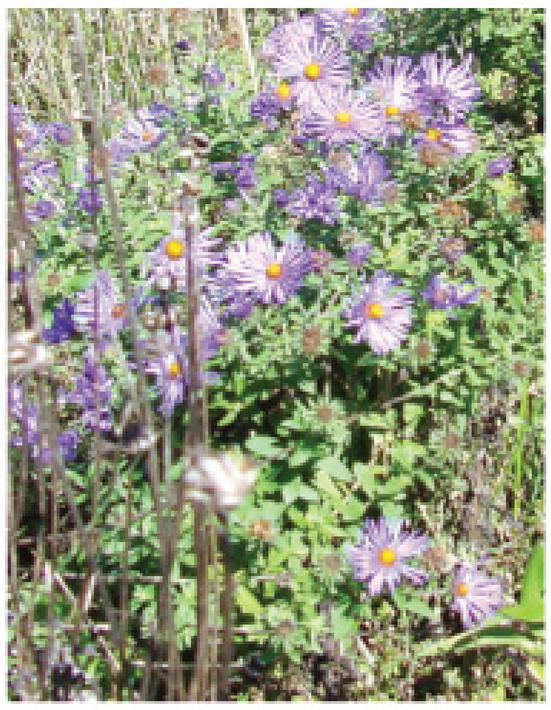
Birdhouses erected at the Irwin Creek treatment plant have already been accepted by bluebirds. Charlotte-Mecklenburg Utilities has made efforts to rid the area of invasive species in favor of native plants, including wildflowers that attract large numbers of birds and butterflies.

Going Wild

CHARLOTTE-MECKLENBURG UTILITIES JOINS WITH ITS STATE WILDLIFE FEDERATION IN A WILDLIFE HABITAT PROJECT AT THE IRWIN CREEK TREATMENT PLANT



PHOTOS COURTESY CHARLOTTE-MECKLENBURG UTILITIES

By Lance Frazer

Wildlife should feel right at home at the Charlotte-Mecklenburg Utilities Irwin Creek wastewater treatment plant. The plant grounds and surroundings include 2.5 acres of meadow, created from fill when a polishing lagoon was removed, as well as 50 acres of wooded natural area.

Plant personnel carried out the project under the Wildlife And Industry Together (W.A.I.T.) program, developed by the North and South Carolina Wildlife Federations. It encourages business and industry to use their vacant land for native flora and fauna.

The Irwin Creek activated sludge plant, built in 1927, sits on a 100-acre site and serves nearly 80,000 people in Charlotte, N.C. Chief treatment plant operator Betsy Hill coordinated the W.A.I.T. project.

"By planting the trees and other sustainable growth, we're helping the community by reducing heat islands. We've also reduced the dust that the mowing used to generate. The main thing is, I believe, that we took what was once an eyesore and turned it into a beautiful, vibrant meadow."

BETSY HILL

SEEDER ON LOAN

Jackie Jerrell, treatment plant superintendent, was approached by Ann Gill, who was waste management specialist with the Charlotte-Mecklenburg Solid Waste Department. She suggested the Irwin Creek staff contact Tim Gestwicki, W.A.I.T. program coordinator and deputy director of conservation programs for the North Carolina Wildlife Federation.

The project began in 2003, when the Bermuda grass covering the meadow area was twice sprayed with herbicide. It was seeded with native plants in December of that year, just after a hard frost. The seed cost the plant just under $900, and the drill seeder and operator were volunteered by the state Division of Natural Resources.

"We used a drill seeder, which injects seeds just below the surface, to avoid disturbing the soil surface and encouraging weed growth," Hill says. "The first and second summers, we had to get rid of the undesirable weeds that did appear, including annual ragweed that we had to pull by hand before it choked out the desirable plants."

NO MORE DUST

Before the meadow was created, Hill says, the staff had to mow the Bermuda grass area regularly, putting clouds of dust into the air. "Now, we mow every Valentine's Day, and that's all," she says. "The meadow is much more appealing than the bare dirt and Bermuda grass. It's especially beautiful in the late summer, when the goldenrod and perennial sunflowers are in bloom. And the native wildflowers have attracted large numbers of birds and butterflies."

Irwin Creek has continued to work with the W.A.I.T. program, installing birdhouses for native bluebirds and maintaining the houses, feeders and a birdbath. "We also put in a row of old-fashioned peach trees next to the meadow, which will provide nectar and fruit," Hill says. "We added a row of redbud trees to provide more nectar, and we planted still more trees on a couple of acres that were cleared in the course of construction staging operations."

Charlotte-Mecklenburg is planning another W.A.I.T. project at Mountain Island Lake, an impoundment of the Catawba River that supplies drinking water to 600,000 people. Possible projects there include a pole and platform for ospreys and eagles.

Gestwicki says there are about 40 W.A.I.T. project sites, and interest continues to grow. "We add 500 people a day here in North Carolina, so we need to work to offset and minimize the footprint caused by development," he says.

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.

'HUGE GREEN WAVE'

"North Carolina is seeing a huge green wave, and the state is ripe for this sort of program," Gestwicki says. "It enables us to preserve some wildlife habitat, and it allows companies like Charlotte-Mecklenburg Utilities to cut their mowing and landscaping costs, and to receive recognition for environmental responsibility. I think it's a classic win-win situation."

Treatment plant operator Phyllis Fakner, who has been at Irwin Creek for 30 years, observes, "I love to watch the different varieties of wildlife. The foxes, deer, birds of prey and the different songbirds. It is important to me to see that the animals and birds are protected and provided for when we invade their territories."

Hill and a few staff members continue maintenance of the projects, taking care of the feeders and mowing the meadow each spring. While the area is not open to public recreation, Hill says the project has benefited both the community and the plant.

"By planting the trees and other sustainable growth, we're helping the community by reducing heat islands," she says. "And we've also reduced the dust that the mowing used to generate. The main thing is, I believe, that we took what was once an eyesore and turned it into a beautiful, vibrant meadow.

"As wastewater treatment personnel, we have a calling to protect the environment," Hills says. "It is more than just a paycheck for us, and through W.A.I.T. and projects like it, we become educated on alternatives to customary landscaping practices such as clearing, planting grass and mowing regularly. We consider how our facilities impact the environment." tpo

TREATMENT PLANT OPERATOR 360

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Interesting uses of equipment or technology.

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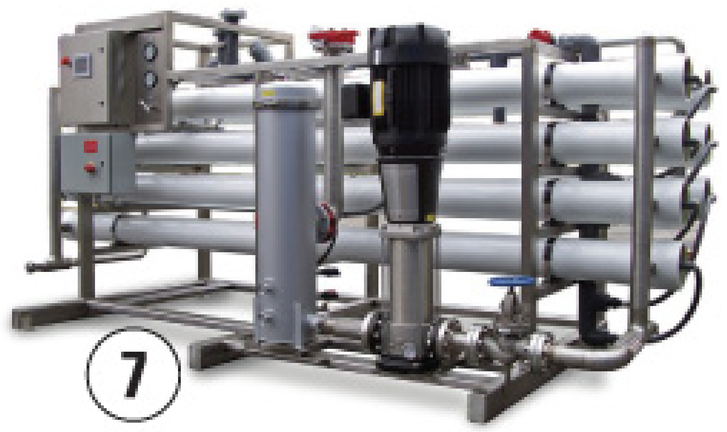
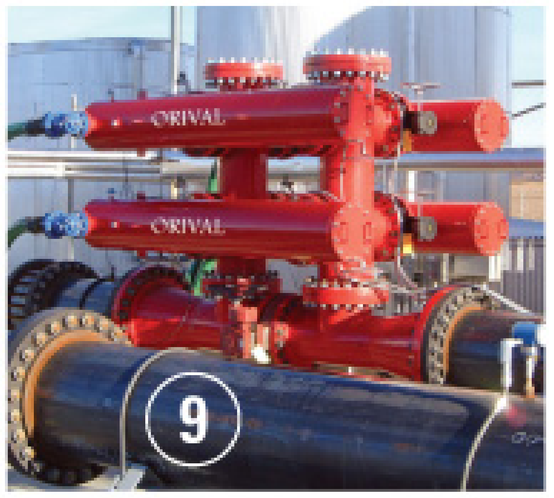




1. JWC INTRODUCES POLYETHYLENE PANEL

JWC Environmental has designed an Ultra High Molecular Weight polyethylene perforated panel for use in its Finescreen Monster. The panel features Staple Guard technology, reducing the chance of debris "stapling" or "hair-pinning" on the abrasion-, wear- and corrosion-resistant panels. Each panel slides into the stainless steel frame for easy removal and maintenance, without having to remove the entire panel assembly from the frame. **800/331-2277; www.jwce.com.**

2. ALLMAX RELEASES OPERATOR 10 SOFTWARE

Operator 10 v8.17 management software from AllMax Software Inc. is designed to save reporting time, provide maximum flexibility, streamline processes, standardize company data, and can be set up for single, multi-user or client server. Applications also can provide state-specific reports that satisfy regulatory reporting requirements, along with custom forms, electronic filing options and periodic reporting. The latest upgrade includes an expanded support menu and enhanced user-friendly functionality. New state reports have been added, while state-specific formulas have been built into the custom reports section. Direct access to go2tech, a Web-based, on-demand remote support service, has been built into each application. **800/670-1867; www.allmaxsoftware.com.**

3. MILLER-LEAMAN INTRODUCES ULTRA-PURE FILTRATION

The Ultra-Pure ultra-filtration membrane system from Miller-Leaman Inc. is designed to remove suspended particulate, bacteria, colloidal and high molecular-weight contaminants from source water. The system provides high-quality effluent water, removing total suspended solids greater than 0.1 micron and producing output water turbidity of less than 0.1 NTU. Each membrane has 460 square feet of surface area operating at less than 15 psi. **800/881-0320; www.millerleaman.com.**

4. KADANT OFFERS UNIGY PUMP CONTROL SYSTEM

The UNiGY pump control system from Kadant AES, equipped with pump-modeling hydraulic-drive technology, employs mathematical models to reduce energy consumption and maintenance costs for washdown applications. Compatible with both clean-in-place and steam-in-place operations, the system continually senses demand and manages pump speed and applied torque to satisfy variations in process demands. For processes where hydraulic demand is intermittent, the system can reduce maintenance and extend pump life. **800/237-7628; www.kadantunigy.com.**

5. SHEAFFER INTRODUCES WASTEWATER RECLAMATION SYSTEM

The Sheaffer System wastewater reclamation and reuse system from

Sheaffer International LLC is designed to reclaim wastewater in a series of deep, aerated pools. The ponds, or cells, typically provide 36 days of aerobic (high O2) treatment, after which the reclaimed water is filtered and disinfected prior to irrigation. For systems utilizing spray irrigation, capacity is provided to store water with no effluent release during the winter or nonirrigation season. Key features include no discharge to surface waters, no odor, no sludge, natural appearance, added property value, service of 1,000 to 3 million gallons per day and eligibility for LEED points. **630/446-4080; www.sheafferinternational.com.**

6. ENCON RELEASES MECHANICAL VAPOR EVAPORATOR

The Mechanical Vapor Compression evaporator from ENCON is designed to convert wastewater into high-quality distilled water for only pennies per gallon. The system has a compact footprint with standard evaporation capacities of 40 to 1,800 gallons per hour (larger sizes available). The wastewater recovery and processing system is automated for unattended around-the-clock operation. Applications include oily water coolants and lubricants, wash waters, rinse waters, RO reject, cooling tower blow-down, printed circuit board assembly waters, salt and brackish waters, treated process waters, groundwater and more. **603/624-5110; www.evaporator.com.**

7. AQUATECH EXPANDS TREATMENT COMPONENTS

Aquatech International Corp. has added six new products to its Watertrack I. Series line of pre-engineered water treatment components. The expanded product line includes LFM Series multimedia filters, LFC Series activated carbon filters, LRL Series reverse osmosis, LRS Series reverse osmosis, LRM Series reserve osmosis, and LSV Series water softeners. All feature Traklink technology to simplify connections and integrate components with upgrade options. **724/746-5300; www.aquatech.com.**

BIO CLEAN DEVELOPS HYBRID STORMWATER TREATMENT SYSTEM

The Modular Wetlands System from Bio Clean Environmental combines nature and technology in a linear stormwater treatment system that incorporates screening, hydrodynamic separation, filtration and bioretention into a modular precast concrete structure that simulates a wetlands area. The hybrid system is designed to treat various pollutants, including fine suspended solids, trash, floatables, oil and grease, sediments, heavy metals, particulate and dissolved metals, as well as nutrients and bacteria. **760/433-7640; www.modularwetlands.com.**

8. ATLANTIC OFFERS MEGATRON WATER DISINFECTION SYSTEMS

Megatron ultraviolet water disinfection systems from Atlantic Ultraviolet Corp. uses multilamp pressure-vessel chambers manufactured in Type 304 or Type 316 stainless steel. Designed for large-scale disinfection of industrial water and wastewater, flow rates range from 90 to 1,800 gpm. Standard features include individual lamp and operational indicators, electronic ballasts, view port as well as drain and test ports. Options include manual or automatic programmable wiping mechanisms, as well as ultraviolet monitoring devices. Systems can be custom designed using lap joint flanges, sanitary fittings and special chamber coatings. **631/273-0500; www.atlanticuv.com.**

9. ORIVAL OFFERS LINE OF WATER FILTERS

Orival water filters are designed to remove organic and inorganic suspended solids, with models from 3/4-inch to 24 inches and filtration degrees from 5 to 3,000 microns. Automatic self-cleaning filters are available in many configurations. **800/567-9767; www.orival.com.**

product spotlight

Omni-Valve Designed for Long Life, Reliable Chemical Settings

By Ed Wodalski

Series 110 Omni-Valve from Hydro Instruments

The Series 110 Omni-Valve represents the latest upgrade for Hydro Instruments of Perkasie, Pa., says general manager Andrew Morgan. On the market since January 2006, the control's linear operation eliminates rotary-drive gears, reducing valve wear by about 80 percent and providing long periods of reliable, continuous operation, Morgan says.

"The biggest problem we had with the traditional way of adjusting the valve stem using rotary drives was you would see the feed rate get itchy — it would go up and down and up and down," Morgan says. "It wasn't smooth and it wasn't terribly repeatable. So we looked to get smooth adjustments and repeatable results."

With a built-in microprocessor controller, the unit can receive analog communication signals from other instruments, such as a water flow meter or residual analyzer. "The program allows the user to tell the valve what chlorine residual level to maintain," Morgan says.

The valve also operates in six different control modes, enabling it to handle a wide range of chemicals. Control modes are field selectable and can be changed at any time. Standard options include manual control, proportional (flow) control, set point (residual) control, set point oxidation reduction potential (ORP) control, compound loop proportional-integral-derivative (PID) control and step-feed rate control.

Other features include a 2-by-20 character liquid display, three analog inputs (flow, residual and remote dosage), adjustable dosage, set points, lag time, signal filters, display ranges, alarms and more. The unit also has two 4-20 mA outputs and password-protected settings. **For more information: 888/384-9376; www.hydroinstruments.com. tpm**

top performer: **AGENCY**

SDLAC operations team members include, from left: James Carpenter, Greg Osburne, James Taylor, Christopher Argo, Eric Robbins, Jeanine Phaneuf and Christopher Reda. (Photography by Patrick Botz-Forbes)

profile

Sanitation Districts of Los Angeles County, Whittier, Calif.

FOUNDED: 1923

SERVICE AREA: 820 square miles

POPULATION SERVED: 5.3 million

TREATMENT PLANTS: 11

TOTAL TREATMENT FLOW: 480 mgd

TREATMENT PLANT STAFF: 525

Secondary clarifiers at the Valencia Water Reclamation Plant in Valencia, Calif. The hybrid step-feed/Modified Ludzack-Ettinger process provided immediate improvements over each system on its own.

THE STAFF AT THE SANITATION DISTRICTS OF LOS ANGELES COUNTY WINS PRAISE FOR QUICK THINKING, INNOVATIVE IDEAS AND CONSISTENT HIGH-QUALITY RESULTS

Operations Is King

By Jim Force

"I'm endlessly impressed with our operations group. They're on the job protecting public health and safety, 24/7."

VICKY CONWAY

The Valencia Water Reclamation Plant produces tertiary filtered reclaimed water to help meet the growing water demands in Southern California.

OPERATIONS IS THE STAR OF THE SANITATION Districts of Los Angeles County (SDLAC). From out-of-the-box ideas to improve treatment plant performance to quick thinking in emergencies, the operations team has played a leading role in the districts' success.

"I'm endlessly impressed with our operations group," says Vicki Conway, head of the Wastewater Management Department. "They're on the job protecting public health and safety, 24/7."

The districts are a regional agency consisting of 24 independent special districts, providing wastewater and solid waste management to about 5.3 million people in Los Angeles County. The service area covers about 820 square miles and encompasses 78 cities and unincorporated territory within the county.

The districts convey and treat some 480 mgd, of which 170 mgd is available, after a high level of treatment, for reuse in the dry Southern California climate. The 24 districts work cooperatively with one administrative staff, led by Steve Maguin, the chief engineer and general manager.

HOME-GROWN SOLUTIONS

As the districts faced the probability of stricter effluent requirements (more restrictive than state and federal drinking water standards) at the Valencia Water Reclamation Plant (21.6 design mgd), supervisors, operators, and research and development specialists brought their decades of experience to bear and developed a home-grown solution.

It promises to enable the Valencia plant to meet tightening nitrogen removal requirements with existing treatment processes. That's critical, because the plant has no room for additional treatment facilities.

"The original plant consisted of two three-pass conventional step-feed activated sludge systems for carbonaceous BOD removal," says Ron Kettle, desert facilities superintendent. "In 1994, the Los Angeles Regional Water Quality Control Board mandated more stringent standards for inorganic nitrogen in the Santa Clara River, our receiving stream. So we converted the two step-feed systems to the Modified Ludzack-Ettinger process (MLE) and built three additional two-pass MLE units."

The districts' research staff also developed an innovative process to treat a filtrate sidestream, which was high in ammonia nitrogen, from the dewatering of anaerobically digested biosolids. This innovative process combines the filtrate and return activated sludge in an aerated tank, which converts all of the ammonia, thus lessening the load on the aeration units. It also seeds the secondary aeration units with nitrifying bacteria.

The MLE process features a recycle line that enables a 100 to 300 percent internal recycle of mixed liquor from the end of the biological treatment process to the front of the individual units. "Since then, we've comfortably met the interim effluent limit of 10 mg/l for NO3-N plus NO2-N," Kettle reports.

Nick Sharp and Joe Shely perform required maintenance and repairs that are critical to Valencia's sustained performance.

NEVER STAY THE SAME

But in 2003, the water board adopted a nitrogen total maximum daily load (TMDL) for the Santa Clara River to address nitrogen impairments. The TMDL included waste load allocations (new effluent limits) for the Valencia plant for ammonia, nitrate and nitrite. Since compliance with the new nitrogen limits required additional treatment, the water board provided interim effluent limits to the plant until the necessary treatment modification could be made to meet the final effluent limits.

In March 2009, the interim limits will be replaced by new final limits of 6.8 mg/l for NO3-N plus NO2-N and 1.75 mg/l for NH3-N, on a monthly average basis. "This will present us with a significant challenge," Kettle says. "As flows continue to increase, and hydraulic residence time decreases, we do not want to exceed the nitrogen limits."

The issue could be even more serious during cold weather, explains Chi-Chung Tang, of the SDLAC's

The innovative approach to secondary treatment has led to a stable operation that consistently removes more than 80 percent of the influent nitrogen.

The existing step-feed channels are still in place and allow for greater mixing of the filtrate.

research staff. "We were occasionally bumping up against the final effluent limits, especially in the winter," he says. "Without further modifications to the biological process, it is unlikely that the plant could consistently comply with the future final effluent limits."

CONVERSION TO TESTING

Enter the SDLAC operation and research team's ingenuity. Using the original three-pass treatment units and the additional MLE units, the team decided to turn the Valencia plant into a full-scale testing facility.

"The channels and appurtenances of the old step-feed system were still in place," explains Kettle, "so we were able to run one train as a step-feed system for nitrification, and another as the MLE process. In the third, we created a hybrid process, and then ran all three side-by-side and tracked results."

"For … 35 years … we've built capacity and capability ourselves. The districts are known for forward thinking; our departments work well together."

RON KETTLE

The hybrid process is a unit run in step-feed mode with internal mixed liquor recycle. Plant operations supervisor Greg Osburne describes some of the innovative thinking that led to the improved performance.

"One of the things that popped into our heads was to rethink where we were bringing the primary effluent into the system," he says. Originally, the stream entered as a plug flow into the selector zone, but the operations team felt they might get better denitrification if they spread the carbon source around.

"Using step-feed gates allows some of the primary effluent to be fed further into the unit, and that has led to better contact and improved denitrification," Osburne says. The team also looked at aeration and mixing, and made adjustments that are paying off.

IMMEDIATE IMPROVEMENT

"The existing system had a deep floating mixer and a shallow floating mixer," says Osburne. "In the hybrid system, we're now using a submersible mixer with the deep floating mixer in order to enhance mixing and achieve better denitrification." They've also replaced the bubbling aerator with a floating mixer in the anoxic zone, since adding oxygen there was defeating the purpose of the denitrification process.

The filtrate from biosolids handling, high in ammonia, got their attention, as well. "The filtrate contains as much as 1,000 parts of ammonia," Osburne says. Using existing tankage for filtrate storage, they've been able to spread out the flow and loading, and that has helped the nitrogen removal process.

Improved performance was evident right from the start, according to Kettle. "Right away, we saw better nitrogen numbers, and the system looked better," he says. "We could see improved appearance, especially in the sedimentation tanks."

Longer-term results compiled over the period have unquestionably demonstrated that the hybrid system is superior in removing nitrogen. "In full-scale testing, the hybrid configuration produced an effluent that contained less NO3-N plus NO2-N than the step-feed or MLE configuration," Kettle, Osburne, and other authors reported in a WEFTEC paper. Levels are typically lower by 2 mg/l throughout the day.

They concluded that conversion of three of the MLE units to the hybrid design proved very beneficial and are planning on converting the two remaining units. That should be adequate to meet the future nitrogen effluent limits.

QUICK THINKING

Staff ingenuity also comes into play in more immediate ways. In two instances, quick thinking by Kettle, Osburne, Michael Creel, and Pat Dial has prevented discharge violations at the Valencia and San Jose Creek East water reclamation plants.

"At Valencia, one of the transformers feeding utility power to the plant failed, leaving about half the plant without electricity,"

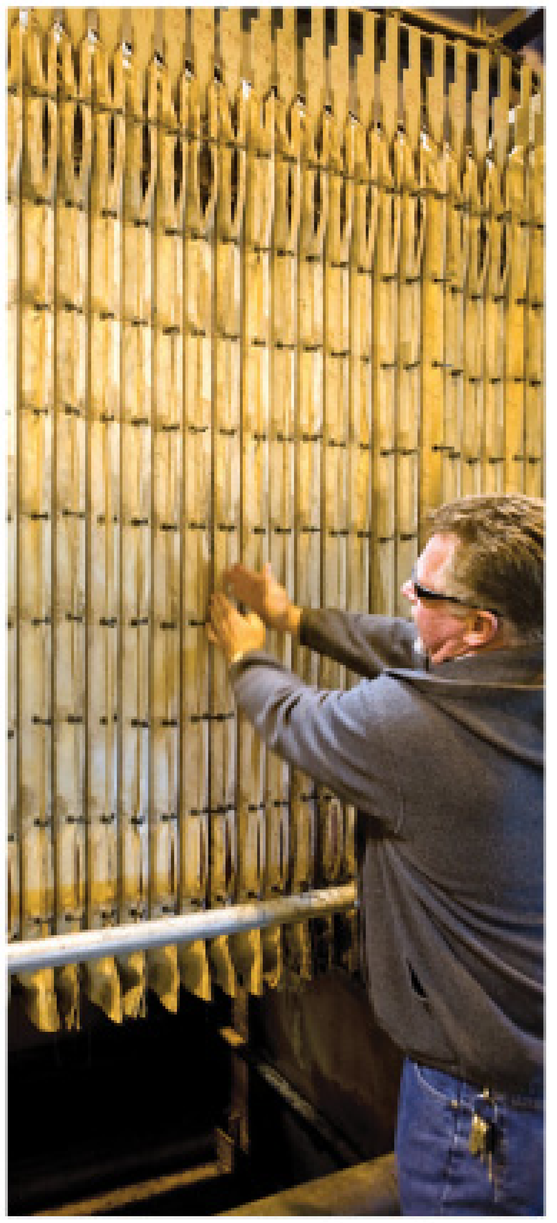
THE HERO OF THE TREATMENT PLANT

The Sanitation Districts of Los Angeles County has a true hero on its team. John Skaggs, senior electrician and instrumentation technician, has been recognized for preventing serious injury to his crew members, and possibly saving lives.

On April 3, 2008, at about 7:15 a.m., the steam turbine in the steam turbine/generator system at the districts' 320-mgd Joint Water Pollution Control Plant Carson began to accelerate rapidly during a shutdown procedure. In seconds, Skaggs recognized the malfunction and the potential seriousness of it.

He raced through the building warning his colleagues of the emergency and telling them to evacuate immediately. Just seconds later, the overspeed of the turbine caused the generator to tear loose from its housing, sending the massive generator and parts into the air as much as 50 feet in all directions. Because of Skaggs' warning to evacuate the building, no one was injured.

At a recent meeting of the districts' board of directors, Skaggs was honored for his quick thinking and heroic actions.



Supervisor Greg Osburne oversees all aspects of Valencia operations.

recalls operations section head Dave Snyder. "The generator we had on hand failed to start, as well. It was late on a Saturday evening, and flows into the plant were still pretty elevated."

Operators pushed as much flow through the functioning part of the plant as they could and, realizing that flows would drop off within the next two hours, diverted any excess to their flow equalization tank on site. "This bought us time to get a temporary generator in place," Snyder says. "Without the equalization tank, we wouldn't have been able to get through the emergency," says Snyder.

At San Jose Creek East, the issue was more complicated. During a scheduled replacement of an electrical transformer that fed a portion of the plant, a temporary generator quit working and would not restart. The distributive control system (DCS) was down, and so were the primary chlorination and dechlorination systems. "We were essentially flying blind for a few hours," says Snyder.

Since San Jose Creek East operates in conjunction with six other plants and tributary trunk sewers as part of a larger Joint Outfall System in Los Angeles County, the San Jose Creek staff, led by Creel and Dial, were able to divert some flow to the San Jose Creek West plant and use excess capacity in a bypass sewer line to accommodate most of the remaining flow.

FAST CHANGE-OUT

This limited the flow that had to be treated at the east plant and greatly lengthened the time before the unchlorinated slug of flow entering the chlorine contact tanks would exit the plant. As unchlorinated flow entered these tanks, it continued to push the previously chlorinated effluent through and out of the tanks. A backup sodium bisulfite system designed to dose automatically upon loss of power, maintained dechlorination while the primary dechlorination system was out of commission.

With the operation stabilized, electrical crews expedited the change-out of the transformer and all systems were back in business. Once the DCS was up and running, "operators could track the wave of unchlorinated effluent moving through the contact tanks," Snyder says.

As the chlorine residual began to drop, indicating that the wave was beginning to exit the plant, operators strategically diverted the slug of unchlorinated effluent to the bypass sewer. To ensure adequate bypass capacity in the sewer, they redirected the influent sewage, which they were previously bypassing, back into the head end of the plant. Once the slug of unchlorinated effluent was completely bypassed, the plant returned to nominal operation.

"Quick-thinking operators who know the options available to them and can adapt — that's the key to solving those emergencies that are bound to happen in wastewater treatment," Snyder says.

DOWN WITH BUREAUCRACY

The Sanitation Districts of Los Angeles County is a huge entity, and it's sometimes true that large organizations suffer from bureaucracy and a tendency toward the status quo. Not so here.

"For the 35 years that I have worked for the districts, we've built capacity and capability ourselves," explains Kettle. "The districts are known for forward thinking. Our departments work well together, and with the increasingly restrictive effluent limits for river discharge, we are constantly being challenged."

Osburne and Tang agree. They report that the research staff gets out in the field, works with the department and section heads, operations and maintenance, and the districts' design team to develop hands-on information that helps make the plant better.

"There's a lot of back and forth. It's not just top-down," says Osburne. "We're always looking for ways to make things run better. That means less headaches for us." tpo

Focus on Energy

AN NEWEA COMMITTEE FOCUSES ON HELPING MUNICIPAL TREATMENT PLANT OPERATING STAFFS BECOME MORE EFFECTIVE STEWARDS OF ELECTRICITY AND FUEL

By Ted J. Rulseh

Treating wastewater takes energy — lots of it. Treating wastewater also creates energy, if you consider methane, a byproduct of biosolids digestion.

For both reasons, energy is getting big attention in the operator community. Municipal plants across America and presumably the world are working hard to reduce their energy consumption and make themselves more energy-independent.

The New England Water Environment Association is a leading promoter of energy management in treatment plants. The association has an Energy Committee, whose main charge is outreach to help member facilities use energy wisely.

The committee, formed in 2007, is chaired by Michael D. Curtis, Ph.D., P.E., a senior vice president with the Fuss & O'Neill consulting engineering firm (with offices in various New England locations). Curtis shared his perspectives on treatment plants and energy in an interview with *Treatment Plant Operator* magazine.

Michael Curtis, Ph.D., P.E., heads the Energy Committee of the New England Water Environment Association.

> "Outside of labor, energy is the single largest cost that wastewater treatment plants face in the Northeast and likely in the rest of the nation. It's also something that managers and operators can do something about."
> **MICHAEL CURTIS**

tpo: Why did NEWEA create a committee to focus on energy?

Curtis: Outside of labor, energy is perhaps the single largest cost that wastewater treatment plants face in the Northeast. It is likely the same in the rest of the nation. It's also something that managers and operators can do something about. That's why we created the committee. I know of a few other state associations that are considering such committees.

tpo: What is the primary mission of the Energy Committee?

Curtis: The primary focus is outreach. We have supply-side and demand-side energy-management opportunities. Our role is to help detail these to people, to show them that it's not insurmountable, that you don't have to spend millions of dollars to improve energy performance.

You don't necessarily have to upgrade the plant. There are a lot of operational modifications that can make big differences. So we want to conduct outreach and education through seminars, EPA literature, and an outreach program that we can take from state to state, inviting operators, superintendents and city officials in to learn about these opportunities.

tpo: Aside from the obvious digester methane, what kinds of supply-side opportunities exist for treatment plants?

Curtis: The most common ones are photovoltaic cells, solar hot water and the occasional site on the coast with wind power. Everyone understands that those are expensive, but they can be viable. They're heavily incentivized. Plants are increasingly evaluating these and putting them in place. One great thing about municipalities is they don't need the same fast return on investment that industry does. They can envision and accept longer-term payback.

tpo: How great is the potential for digester methane as an energy source?

Curtis: Speaking for New England specifically, there has been a trend to abandon sludge digestion. In my opinion, that is going to be reversed. For a time it was seen as expedient to eliminate digestion in favor of less costly alternatives. In Connecticut, for example, there are five commercial sludge incinerators. That has been the fate of the vast majority of sludge — it's burned.

Of late, with concern about energy conservation and climate change, the value of that carbon resource is becoming apparent, and new digestion opportunities are arising. Several larger plants have built digesters in the last few years in New England, and more are on the drawing board. Of course, getting back into digestion has financial implications. It's a multimillion-dollar decision for a midsize facility.

Also on the supply side, there is an occasional plant adding internal hydropower generation — typically pretty small, but it has some advantages. There's also a significant effort in bringing high-strength carbon waste, like FOG, to digesters for more methane production. These are the supply-side opportunities we want to educate people on.

tpo: Where are the opportunities on the demand side?

Curtis: Here, the opportunities are limited only by the operators' imagination. The list is as long as your arm. Some measures are very simple, and others much more involved.

tpo: What are some examples of simple, low-cost measures?

Curtis: A number of improvements can be made without a plant

upgrade and without capital expenditure. For example, if you can somehow enhance carbon removal in primary settling, you have to treat that much less with aeration, which typically is the highest energy cost in a plant. Get more to settle with whatever enhancement technique you can, whether by polymer addition or some kind of coagulation.

Another measure you can take is blower optimization, which can save a tremendous amount of money. Some plants simply have one blower setting — on. That covers the highest loads during the day, but if the flow drops to one-third of that by 3 a.m., and they're still running the same level of aeration, that's not efficient.

Could you ramp that blower down at times of lower flow and save a lot of power? Could you install a more efficient blower? There's a new generation of blowers coming out that are aerospace in nature. They run on air bearings — they have one moving part.

tpo: What about more complex mechanical or electrical changes?

Curtis: With capital upgrades, there are any number of retrofits. You can go through the plant, do an energy audit, identify the big power users, then look at the various retrofits and upgrades you could perform and what they will return.

You can retrofit variable-frequency drives, add high-efficiency motors, high-efficiency lighting or day lighting. You can upgrade the HVAC systems. Inside almost any building, if it's got any age, there is likely a potential payback in buying new, more efficient, better equipment.

Our committee is providing information from local utilities about their incentives for high-efficiency equipment. The Northeast utilities have some of the strongest upgrade incentive programs in the nation. If you need a new motor, for example, you can buy a standard efficiency motor, or you can buy the high-efficiency model, and the utility will participate and buy down the additional cost. That makes the high-efficiency model affordable — a real no-brainer.

tpo: What about more innovative energy-saving measures?

Curtis: I know of a small number of plants that are operating heating and cooling off their effluent streams. In summer, for example, effluent is at about 70 degrees F. You can put in a simple heat exchanger and use that for cooling. Efficiency goes down in winter, because you're trying to pull heat out of 50- or 55-degree water; but it's still cost-effective to do. It's similar to a geothermal application, except the source heat sink is effluent.

tpo: How successful has your outreach been so far?

Curtis: We're making good progress. We have very strong participation by our EPA region. We're also working various other fronts. NEWEA has an annual conference that is extremely well attended. It includes sustainability sessions and mechanical case study sessions. We also have an annual energy specialty conference, where the audience attends a day-long session that is much more intensive.

We're also developing our state-to-state program for delivery to the state associations. Not everyone can afford to go to our annual conference in Boston for three days and stay in an expensive hotel. But most people can make a day trip to their state organization.

"You can retrofit variable-frequency drives, add high-efficiency motors, high-efficiency lighting or day lighting. You can upgrade the HVAC systems. Inside almost any building, if it's got any age, there is likely a potential payback in buying new, more efficient, better equipment."
MICHAEL CURTIS

tpo: What role does interest in sustainability play in decisions about energy projects at treatment plants?

Curtis: Right now, economics is driving most of the changes, but increasingly, municipal sustainability initiatives are taking hold. People are saying, "We do this, number one, because it makes economic sense, and number two, because it's the right thing looking forward." Sustainability has an increasingly important role in decisions affecting energy management. tpo

ALL THE SENSES

IN RUNNING AN EPA AWARD-WINNING SMALL TREATMENT PLANT ON THE MISSISSIPPI RIVER, OPERATOR TODD LAKEY RELIES ON ART AND EXPERIENCE AS MUCH AS SCIENCE

By Ted J. Rulseh

TODD LAKEY DOESN'T NEED LAB TESTS OR fancy instruments to tell whether his treatment plant is running as it should. Sights and smells and a few simple tests generally give him all he needs to know.

Lakey, 44, operates the Village of Trempealeau (Wis.) Wastewater Treatment Facility, a 0.235 mgd (design) plant on the Mississippi River that earned a 2007 National Clean Water Act Recognition Award from the U.S. EPA in the Small Secondary Plant category.

The plant has no in-house laboratory and minimal instrumentation. It does have Lakey's experience and his keen eye for signs that the process isn't, in his words, "happy."

Todd Lakey, operator of the award-winning Village of Trempealeau Wastewater Treatment Facility, uses a mixture of science and experience to keep the plant in full compliance with its permit. (Photography by Casey Lake)

The facility doesn't just meet its permit requirements — it beats them by a mile. BODs of 2 or 3 mg/l are common, versus a permit limit of 30 mg/l. Fecal coliforms in final effluent are usually in single digits versus a permitted 400 colonies per 100 ml.

HELPING THE HOMETOWN

Those aren't bad accomplishments for someone who a dozen years ago rarely if ever thought of wastewater treatment. Lakey worked as a barge loader/unloader and heavy equipment operator in nearby Winona, Minn., before Trempealeau hired him to run its new oxidation ditch treatment plant in 1997.

He applied for the job, and the village hired him, before he had any schooling in the profession. The village paid for his education, in which he eventually earned the necessary Grade 2 wastewater operator license.

For Lakey, who has lived in Trempealeau all his life, it was a way to explore a new career and quit commuting. "This is my hometown," he says. "I love the hunting and fishing in the area. There are a lot of good people. It's a great place to live — a nice little river town."

Besides running the plant, Lakey and helper Duane Fruechte assist the village street department with assorted tasks and also maintain the collection system. It was Lakey's work at the plant that impressed Wisconsin Department of Natural Resources (DNR) officials enough so that they nominated the plant for the EPA award.

"Trempealeau gets large numbers of weekend people in the summer," notes Judy Hayducsko, a water resource engineer with the DNR. "Having to adjust from smaller to larger flows can be very difficult, and Todd does that very well. Besides performing the necessary scientific tests, he can look at the plant and smell it and use his observations to help determine what to adjust and when. He thinks about what he needs to do, and then he does it."

KEEPING EYES OPEN

Much of the seasonal increased flow comes from a sanitary district serving a large number of cottages along the river. Flow can increase by 20,000 to 30,000 gpd on busy weekends, a substantial change for a plant with an average flow just over 100,000 gpd.

Influent and effluent samples are sent to Davy Laboratories in La Crosse, Wis., for analysis. The plant has its own dissolved oxygen (DO) and pH

(Continued on page 28)

profile

Village of Trempealeau (Wis.) Wastewater Treatment Facility

OPERATOR:
Todd Lakey

BUILT:
1997

POPULATION SERVED:
1,450

TREATMENT LEVEL:
Secondary

TREATMENT PROCESS:
Activated sludge (oxidation ditch)

FLOWS:
Design 0.235 mgd, average 0.103 mgd

PERMIT LIMITS:
30 BOD, 30 TSS, 150 lb/mo phosphorus

RECEIVING WATER:
Mississippi River

"Having to adjust from smaller to larger flows can be very difficult, and Todd does that very well. He can look at the plant and smell it and determine what to adjust and when. He thinks about what he needs to do, and then he does it."

JUDY HAYDUCSKO
WISCONSIN DNR

Todd Lakey turns a decant valve on the side of a biosolids storage tank. Lakey's decision to relocate this valve enables him to store solids for two years before the tank must be emptied.

PERSONAL REASONS

Todd Lakey has many reasons for wanting to help keep the Mississippi River clean. Perhaps the biggest is that he's a walleye fisherman.

Lakey loves fishing around the river's wing dams near the Village of Trempealeau, trolling, casting a lure, hopping a jig and leech, or dangling a willow cat minnow on a slip-sinker rig. He's after a 10- to 12-pound walleye, but so far hasn't managed to connect with one.

"I've caught a few nine and nine-and-half pounders, which aren't too bad for this river," he says. "Every year people get bigger ones than that. I just haven't been lucky enough yet." You can bet he'll keep trying.

Lakey enjoys working in his hometown and taking advantage of excellent walleye fishing on the Mississippi River. His work at the village treatment plant helps keep the river healthy.

"Cleaning is something many people wouldn't think you'd have to do at a sewage plant. But you've got to keep things clean. That's one of the things that I just do. Whether it affects my results or not, I like to keep things clean around here."

TODD LAKEY

(Continued from page 26)

measurement instruments. Lakey also performs the 1000-ml settling test once or twice per week to help determine when to waste activated sludge from aeration. He also regularly performs the mixed liquor suspended solids (MLSS) test.

"We have an awfully good system here," he says. "We take frequent DO readings and make sure we provide a lot of oxygen to keep those bugs happy."

In addition to that, it's a matter of "keeping a good, watchful eye. I can go to the aeration ditch, take one look, and tell you if it's happy or not feeling very good. You can tell a lot just from the color of the mixed liquor. If it's looking thick, if things look like they're going to slow down and possibly plug up, maybe it's time to waste the system."

Besides minding the day-to-day process, Lakey has made some modifications to the plant that improve operations. For example, the storage tank for digested biosolids originally had four decant valves, all at the very top.

"Often, there was a good 10 feet of clears in the tank, and I had no way to get rid of it," he says. "I had to hire our hauler to empty the tank every

IN RECOGNITION

Here is some of what the U.S. EPA Office of Water Management said about the Village of Trempealeau Wastewater Treatment Facility in its profile on the plant for its 2007 National Clean Water Act Recognition Award:

"The (plant) is recognized for its dedication, through stringent process monitoring and system maintenance, and for providing treatment services incorporating environmentally conscious methodology.

"Daily testing of pH, settleability and dissolved oxygen, together with experienced operators, have contributed to the successful operation of the plant. The maintenance and complete system cleaning every two years, in addition to an asset management strategy, have helped to ensure proper and efficient facility operation.

"Strategies implemented by the (plant) have enabled it to maintain a record free of NPDES violations. This well-managed, well-financed, low-capacity facility has put into place techniques that will enable it to continue its successful and low-impact treatment processes."

year to make sure we had enough room for storage through the winter. I took one of the decant valves from the top of the tank and moved it halfway down. Now I can get two years of storage."

FIGHTING FOAM

Another innovation, mentioned in the DNR's EPA award nomination, was a cure for a periodic foam buildup in the oxidation ditch caused by filamentous organisms. Foaming can upset normal operations and cause bulking and settling problems.

"We used to hire a vacuum truck to remove the foam," Lakey says. "But that cost a lot of money." Instead, Lakey and Fruechte created a portable foam-removal system using a large wet/dry vacuum purchased at a local chain retail store.

They drilled a hole in the bottom of the vacuum and connected a PVC tube to it. They vacuum the foam from the basin and allow it to feed by gravity into a splitter box, from which it is conveyed to the anaerobic digester. There, the foam is treated before decant is sent to the head of the plant and before digested solids are sent to the storage tank. The filamentous organisms can no longer thrive, and problems are minimized.

Another part of sound operation, in Lakey's view, is simply good housekeeping. "Cleaning is something many people wouldn't think you'd have to do at a sewage plant," he says. "But you've got to keep things clean. That's one of the things that I just do. Whether it affects my results or not, I like to keep things clean around here."

One such task that does affect results is regular cleaning of the plant's small UV rack disinfection system. "We pull the UV lights once or twice a week and clean them, and we hose them down every day, so there's no buildup on them," Lakey says. "That gives us excellent fecal coliform counts. We haven't even come close to going over our limit on fecals. It's a really simple thing, but it certainly works."

And the Trempealeau treatment plant consistently works — to help keep the Mississippi clean for residents and visitors alike. tpo

Toward Independence

THE GRESHAM (ORE.) WASTEWATER TREATMENT PLANT LOOKS TO COMBINED HEAT AND POWER, SOLAR ENERGY AND EVEN SMALL-SCALE HYDROPOWER FOR ENERGY SAVINGS

By Mike Grennier

Whether it's a combined heat and power system, fat, oil and grease (FOG) management, solar energy or even hydropower, the Gresham (Ore.) Wastewater Treatment Plant leaves no stone unturned in its quest for energy independence.

The plant and its operating staff are well on the way toward that goal. This 20-mgd activated sludge facility has been operated since 2005 by Veolia Water North America. Sixteen Veolia employees work there. Alan Johnston, senior engineer with the City of Gresham Wastewater Services Division, oversees the contract with Veolia.

Energy savings have always been a priority for the city. "The ultimate goal is to make sure we're doing what we can to manage costs," Johnston says. "Keeping our rates low and doing everything we can to ensure long-term sustainability is a benefit to everyone."

The current configuration of the Gresham Wastewater Treatment Plant. Solar panels are planned for the area shown in bottom right corner of the picture.

METHANE-TO-ENERGY

The plant got a jump on energy savings in 1989 when it installed a 250-kW combined heat and power (CHP) system using digester gas for fuel. The system supplies a portion of the plant's electric power and provides process heat for two digesters, which produce gas containing 60 percent methane.

The plant also initiated a number of energy-efficiency measures (EEMs) in the mid-1990s. These include such activities as using motion sensors for lighting and replacing inefficient motors with energy-efficient units on a routine basis.

By 2003, the CHP system was nearing the end of its useful life and operating inefficiently. The facility was flaring 41 percent of its digester gas. In late 2005, the city installed a more efficient 395-kW CHP system. The unit routinely operates near full capacity to supply nearly half of the plant's 800-kW peak load.

It also can be manually switched to backup mode to keep critical components online during a utility outage. The system includes:

PHOTOS COURTESY OF CITY OF GRESHAM WASTEWATER SERVICES DIVISION

TOP PHOTO: Methane from the plant digesters is captured and treated for use in heating and power generation. LOWER LEFT: A 395-kW CAT combined heat and power system supplies nearly half of the plant's 800 kW peak load. Piping for the combined heat and power system.

> "You have to give credit to a good [CHP] machine to achieve high uptime, but I also think a real key is providing clean gas to engine. In terms of the bang for the buck, we get a lot of value out of the unit for the investment and the effort we put into it. It's a real win for the city and the plant."
>
> **PAUL PROCTOR**

- An eight-cylinder Caterpillar G3508 engine-generator set specifically designed to use low-pressure digester gas.
- A fuel treatment system that removes moisture and contaminants. It consists of a chiller to condense moisture, a packed bed reactor to remove hydrogen sulfide, and two packed bed reactors to remove siloxanes.
- A heat recovery system that produces water at 180 degrees F from the engine coolant and exhaust. The hot water heats the plant's two digesters to 91 degrees F. In cold weather, some of the hot water heats the facility's administration building.

- A sophisticated control system that provides multiple operating modes, depending on the system conditions and facility loads.

BACK ON TRACK

Since its startup in 2005, the CHP system has performed to expectations, and staff members credit it with helping the plant get back on track with its energy- and cost-management goals. To date, the system has achieved 95 percent availability and produces electric power savings of $18,000 to $20,000 per month.

Johnston also says the ability to tap into the unit's hot water reduces the amount of natural gas and electricity the plant would otherwise need to purchase to heat the digesters and the administration building. Savings are significant, although he has yet to calculate them. Flaring of digester gas has been reduced to zero. The payback for the system is projected at 5.9 years.

"The numbers show that it's a very productive and very successful machine," says Veolia project manager Paul Proctor, who oversees daily treatment plant operations. He says the plant has only encountered relatively minor issues with the system.

"If we run into an issue, we'll troubleshoot it ourselves to find out if it's something we can address ourselves," Proctor says. "If it gets into the machine itself, we'll call in the local Caterpillar dealer."

On a daily basis, Veolia Water's crew checks the system for oil and water leaks. The team also pays close attention to the fuel treatment system to ensure it's delivering contaminant-free fuel.

"You have to give credit to a good machine to achieve high uptime, but I also think a real key is providing clean gas to engine," he says. "In terms of the bang for the buck, we get a lot of value out of the unit for the investment and the effort we put into it. It's a real win for the city and the plant."

Johnston couldn't agree more. A side benefit of the CHP system, he says, is that it helped stimulate a stream of fresh ideas for gaining energy independence. "If the CHP system is producing 55 to 60 percent of the energy to power the plant, we figure we're close to being energy-independent," Johnston says. "So we've asked ourselves, 'What else can we be doing?' There's got to be better ways to manage our power."

FINDING ANSWERS

After studying the issue, officials learned of a number of ways to better manage power and become totally energy-independent. The solution will take the shape of alternative energy sources, third-party purchase agreements and best industry practices.

One alternative energy source that shows promise is solar power. A recent study funded with help from Energy Trust of Oregon Inc. demonstrated that the plant could produce all the power it needs by installing a large solar power system on 20 acres of unused land. But rather than jump in with both feet, the city has taken a conservative approach. Toward that end, it let bids to companies willing to build a small-scale solar system on the land and sell the power back to the plant.

And the idea is starting to take hold. Gresham is negotiating an agreement for a 400-kW solar power system that would produce about 5 percent of the plant's power for six cents per kWh — two cents less than it pays for utility power. The goal was to have the system up and running in January 2009.

In 2007, the plant also began an aggressive FOG outreach program. The ultimate goal is to inject FOG directly into the plant's two digesters and capitalize on the additional methane produced. "Based on what we've seen in the industry, FOG produces something like three times as much methane as regular wastewater, and to us, that's a tremendous source of energy," Johnston says.

> "I think it's great to say you're energy-independent and you're using green energy, but you have to be careful. You have to understand lifecycle costs, crunch the numbers and look at payback."
> **ALAN JOHNSTON**

The city has been working diligently to assess the volume of FOG it can capture and put to good use. To do so, the city assigned an employee to visit food service establishments and accurately record the amount of FOG produced by each throughout the course of a year. The city is also exploring grants to study the concept further. That includes finding a way to get the FOG to the plant and process it.

Yet another concept on the table is what Gresham calls "micro-hydro power" — installing a turbine at the plant's outfall. "It would be on a very small scale with a peak output of something like 40 kW," Johnston says. "But that pipe is pushing out water, and it's got energy in it, so we want to know what we can do to harness that energy. It would be another piece of low-cost energy in our pocket."

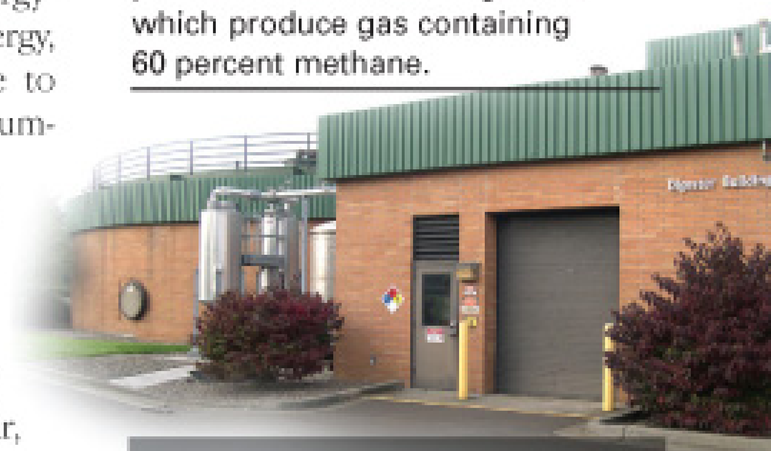
MOVING TOWARD SUCCESS

Johnston says energy independence is definitely in the plant's future. It's just a matter of creating its own sources of power for the right cost. "We're already saying we can achieve energy independence just with solar," Johnston says. "But the capital costs of solar are tremendous, so that's why we're working to find another way around it.

"I think it's great to say you're energy-independent and you're using green energy, but you have to be careful. You have to understand lifecycle costs, crunch the numbers and look at payback."

Johnston says it's not a matter of whether the plant will succeed but when. He said officials are most excited about the potential of a FOG program. "If you implement third-party agreements like we're doing with solar, and combine it with other kinds of power production, energy independence is absolutely possible," he says. "And each one of these initiatives gets us closer to our goal. Ultimately, it's about saving money and sustainability, which benefits everyone." tpo

This building houses the Gresham plant's two anaerobic digesters, which produce gas containing 60 percent methane.



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.**

QUALITY OPERATIONS BACKED BY SHARP MARKETING MAKE A CLASS A PELLETIZED BIOSOLIDS PRODUCT A BIG SUCCESS FOR THE OCEAN COUNTY (N.J.) UTILITIES AUTHORITY

In Great Demand

By Jim Force

The Ocean County Utilities Authority in Bayville, N.J., operates three wastewater treatment plants with 80 mgd total design flow. The agency also runs an EPA award-winning biosolids program. (Photography by Michael Sypniewski)

profile

Ocean County Utilities Authority, Bayville, N.J.

AREA SERVED:
916 square miles

POPULATION SERVED:
600,000

TREATMENT PLANTS:
3

TREATMENT FLOW:
80 mgd (total design)

BIOSOLIDS PRODUCTION:
8,500 dry tons per year

BIOSOLIDS STAFF:
4 (management)

ANNUAL BUDGET:
$4 million (biosolids only)

WEB SITE:
www.ocua.com

"WE LEARN BY DOING," ARISTOTLE OBSERVED nearly 2,400 years ago. That's exactly the experience of biosolids managers in Ocean County, N.J., where the Class A OCEANGRO biosolids-based organic fertilizer is winning customers and awards.

"When we started, we didn't know much," explains Dave Ertle, director of central services and fertilizer manufacturing for the Ocean County Utilities Authority (OCUA), based in Bayville. "We had no experience, no markets, no customers, and nobody knew anything about us."

Today, OCEANGRO is one of the most sought-after fertilizers on the East Coast, and the only thing keeping Ertle and his team from selling more is the amount of wastewater the utility has to work with. The success is due to several factors — operational excellence, product quality and targeted marketing. But for Ertle, it really boils down to unqualified support from top management and the fact that OCUA is in charge of the fertilizer process from one end to the other.

While outside contractors handle biosolids marketing and distribution at other treatment agencies, "We control our own destiny," Ertle says, "from biosolids production and quality control of the fertilizer product, through to marketing, sales and customer relations. We may be unique in the United States."

Dave Ertle, director of central services and fertilizer manufacturing for the Ocean County Utilities Authority in Bayville, N.J., stands atop one of four 110-foot silos, each of which holds 600 tons of OCEANGRO fertilizer.

OCEANGRO is a Class A dried biosolids product that is extremely popular as a landscape fertilizer.

BIOSOLIDS TO FERTILIZER

Three wastewater treatment plants (total design flow 80 mgd) serve some 600,000 Ocean County and southern Monmouth County residents in the OCUA coverage area.

Digested, screened biosolids generated at these plants are gravity thickened, then brought together and blended in a storage facility at the Central Wastewater Treatment Plant in Bayville. Then they are dewatered and thermally dried to make OCEANGRO pellets.

The fertilizer production facility contains polymer preparation and feed systems, three Andritz 2.0-meter SMX-S14 belt filter presses, and two Andritz model DDS-40 drum drying systems supplied by Andritz Separation Inc.

Andritz also operates the fertilizer plant on a 24-hour, five-days-per-week schedule, under the terms of a five-year operating contract that has been renewed twice since plant startup in 1997 (see sidebar).

The pellets are inspected for size and hardness, and then distributed commercially as 5-5-0 (nitrogen-phosphorus-potassium) fertilizer. Ertle reports distribution of about 175 dry tons of OCEANGRO per week (about 8,500 dry tons per year) to golf courses, baggers and blenders, and participant municipalities throughout Ocean County. The OCUA also bags some product and makes it available to homeowners through local garden centers.

The OCEANGRO program received the Wave Award from the New Jersey Association of Environmental Authorities in 2006, and a first place in the U.S. EPA National Clean Water Act Recognition Awards in 2007. Reinforcing the OCUA's beneficial use program as a national model, the History Channel featured it as part of its "Modern Marvels" series in June 2007.

LESSONS LEARNED

While the Ocean County fertilizer project is gaining national kudos, it hasn't always been that way, and OCUA has learned some hard lessons. The agency's biosolids management strategy dates back 15 to 20 years, when wastewater treatment plants in New Jersey moved away from ocean dumping and landfilling of sludge.

"We made the decision to turn our biosolids into organic fertilizer and go with land application," he says. However, despite a lot of hard work, the OCUA's first attempt at drying was a technological failure. "Even though the technology didn't work, we remained passionate about the idea of making fertilizer," Ertle says, "and we had all the necessary infrastructure — trucks and silos, for example."

After reviewing other processes (Milorganite in Milwaukee, and several plants in Europe), OCUA settled on dewatering and drying technology from Andritz, which agreed to set up a full-scale facility and operate the process through the performance test. The company ultimately agreed to ongoing operation of the plant. "We wanted to make this work, and so did Andritz," Ertle says, "They met the power and production requirements. They've been very responsive to our needs."

Dave Ertle shows off a banner announcing the facility's 2007 National Clean Water Act Recognition Award from the U.S. EPA.

WHAT'S NEXT FOR OCEANGRO?

The leaders at Ocean County Utility Authority are not letting the awards and market success of OCEANGRO go to their heads. They are moving forward with plans to improve the process and the product.

Having worked on the fertilizer project for more than 15 years, the utility still has some of the original equipment in need of replacement. And they want to cut costs.

"We're adopting dewatering at all three treatment plants," says Dave Ertle, director of central services and fertilizer manufacturing.

The utility wants to avoid the high cost of hauling 8 percent solids thickened material by hauling dewatered cake. "If we can get our feed cake up to 22 percent solids, we'll save on transportation as well as energy costs in the drying process," Ertle says. "With today's fuel costs, 16 to 17 percent is unacceptable.

"Getting a consistent quality of cake to feed the dryer is a good challenge. We also want to polymerize once, not twice, to reduce chemical costs." The authority also wants to make the best possible pellets. "We're working on plans right now to make sure our pellets stay hard and blend well with other materials," Ertle says.

A grant project to help save the dunes on the Jersey Shore by replanting dune grasses included OCEANGRO. OCUA collaborated on application rates and supplied the material at no cost. The replanting program is now underway.

OCEANGRO has been added to leaf compost to accelerate the composting process, gain space in the composting yard, and create an improved product. As a result, Ocean County can now process twice as much leaf compost as before, and can sell the product. Previously, the authority had trouble giving it away.

At a Superfund site, OCUA is discussing bioremediation with OCEANGRO to see if it might help increase bioactivity and cleanup of the contaminated soil.

Above, a computer monitor display shows a schematic of the process for making OCEANGRO fertilizer at the Ocean County Utilities Authority. Operators can control the process from the computer. At right, a close-up of the process diagram.

CRITICAL PROCESS

Manufacturing a Class A biosolids product that meets environmental and market requirements, day after day and year after year, doesn't just happen. The OCEANGRO operation calls for constant attention and coordination, and that is where Peter Kusion comes in.

Kusion, operations superintendent of the fertilizer manufacturing division at OCUA, is responsible for making sure the proper amount of solids is flowing from the treatment plants to the drying plant, and that the required quality of biosolids pellets is flowing from the drying operation to the marketplace.

"I account for everything — where it all goes," he says. "I'm the traffic cop." That means managing the relationship between the three treatment plants, dryer operator Andritz, the inventory and billing departments, and customers in the field.

"He really stays on top of the issues," Ertle observes. Using a PC loaded with Active Factory software from Wonderware, Kusion monitors all facets of the operation from his office in Bayville. If the supply of incoming biosolids to the storage tank is too low or too high, Kusion can see that and call for corrections. If the outlet temperature in the drying operation is off specification, or the drying system isn't getting enough plant effluent for cooling water, he can see that, too, and make necessary modifications.

Staying in compliance and producing a quality pellet are high on his list of critical things to watch. "Our drying operation conforms to a strict air-quality permit," he says. "And our pellets must meet standards for heavy metals and pathogen reduction in order to be shipped freely as a fertilizer. Regulations play a heavy role in how we operate."

Kusion also monitors the size and hardness of the pellets, as well as their dust content. "No one wants to handle dust, and dust can cause problems," he says. The integrity of the pellets helps customers manage the product in the field, and mix and blend it with soil or other soil amendments. Kusion also keeps track of the temperature of the pellets in the storage silos and can

mix the material or move it to an empty silo if the material starts to overheat and temperatures spike.

"Monitoring is critical," he says. Kusion watches the fertilizer plant's utility usage to make sure operations are efficient. He also maintains the buildings and equipment and orders supplies. He even gets involved in customer relations.

"Sometimes with biosolids products, you can have odor issues if the product gets wet or if the application procedures aren't properly followed," Kusion says. "Sometimes I need to go out into the field and work with customers who may have applied the material too heavily or without mixing it into the soil adequately."

"It took off like wildfire. OCEANGRO is organic and slowly releases nutrients that nourish the root structure, improving the health of the turf. It's doubly attractive now as fuel prices rise and the costs of producing and shipping chemicals and commercial fertilizers increase accordingly."

DAVE ERTLE

CUSTOMER-CONSCIOUS MARKETING

The work of Kusion, and Patricia Matarazzo and Scott Rosen who handle customer relations and orders as part of the OCEANGRO project, pays off on the marketing front where customer loyalty is the norm, not the exception.

"Because we didn't know much when we started," Ertle explains, "we literally went back to school." The team spent time with farmers and golf course superintendents, took crash courses in agronomy through Rutgers University, and established a relationship with the former Synagro division of Wheelabrator that helped acquaint the OCUA team with the biosolids fertilizer distribution business.

"We learned by doing," Ertle says, "We pelletized it, bagged it, stretch-wrapped it, and started providing it to homeowners to demonstrate how safe it was." The OCUA staff showed people how to use the material. They joined the relevant associations and started a comprehensive communications program, talking to schools and master gardeners, and exhibiting at the annual turf conference in nearby Atlantic City.

They were prepared to handle distribution of the product themselves with their own fleet of two tractor-trailers, a tender truck and five spreaders (made by Willmar Fabrication LLC, and C.U. Stoltzfus Manufacturing Inc.)

OCUA devised forms for sales, shipping, pricing and credit applications, as well as accounting and billing procedures. A Web site gives the public easy access to information about OCEANGRO.

In the first year of distribution, OCUA had an opportunity to demonstrate how biosolids could be substituted for topsoil in the construction of fairways on a new golf course. The success of that project and the experience it gave blossomed into 15 new course construction jobs, as well as jobs at numerous driving ranges and athletic fields. OCUA is now a consultant for engineering firms and golf course architects to help develop turf preparation and development specifications for new projects.

"It took off like wildfire," Ertle says. "OCEANGRO is organic and slowly releases nutrients that nourish the root structure, improving the health of the turf. It's doubly attractive now as fuel prices rise and the costs of producing and shipping chemicals and commercial fertilizers increase accordingly."

In fact, with paying customers that include 40 golf courses, five bagger-blenders who use the material as a fertilizer base, and 15 to 18 garden centers where homeowners can buy 50-pound bags, OCEANGRO is sold out. "I think we could distribute three times what we make," says Ertle. **tpo**

more info:

Andritz Separation Inc.
817/465-5611
www.andritz.com

C.U. Stoltzfus Manufacturing Inc.
800/843-8731
www.stoltzfusmfg.com

Wheelabrator Technologies Inc.
800/682-0026
www.wheelabratortechnologies.com

Wonderware
949/727-3200
www.wonderware.com

Scott Rosen, fertilizer shipping coordinator, watches as OCEANGRO fertilizer is dispensed to a truck.

THE ANDRITZ ROLE

Of all the drying plants installed by Andritz Separation Inc., Ocean County is the only one Andritz operates. That's because the two entities grew up together in the biosolids fertilizer business. The relationship is based on experience and mutual respect.

"Dave Ertle and his staff are passionate about producing and marketing fertilizer from biosolids, and are absolutely determined to make it work," says Steve Huff, executive vice president of Andritz, who was project manager on the OCUA job. "They learned from their first technical failure and established single-point responsibility by insisting that the drying system supplier be the contractor on the current project. That has made a huge difference in the success of this facility."

The specification also called for the supplier to operate the plant successfully through the performance-testing period. That experience prompted interest from Andritz and OCUA in a longer-term five-year operations contract.

"Since we had to staff up for the initial operation, we already had knowledgeable people there — it made sense," Huff recalls. That contract has been renewed twice since, a testament to the good working relationship.

The Andritz crew consists of plant manager Jeff Kravitz and two operators plus a "floater" per shift, for a total of seven operators. The plant operates around the clock, five days per week, although the schedule changes somewhat with the seasons.

Ocean County flows increase during the summer tourist season (May to September) so during that time the plant may run into the weekends. Then it drops off a bit in the off-season. "We manage around that," says Huff.

Striking a Balance

AN ONTARIO TREATMENT PLANT ADOPTS A BIOMASS BALANCE STRATEGY, USING PROCESS CENTRIFUGES TO DELIVER ACCURATE DATA FOR QUICK, INFORMED DECISIONS

By Mike Grennier

Guelph Wastewater Treatment Plant (GWWTP) prides itself on using advanced technology and best practices, and every aspect of the plant's operation plays a key role. That explains why the plant recently began using process centrifuges to quickly and accurately gauge the level of biomass throughout the operation. In turn, that helps the plant consistently achieve effluent quality and stability.

With a population of about 100,000, Guelph lies just west of Toronto in southern Ontario. The Wastewater Services Division operates the 64,000 m^3/day activated sludge plant, which provides tertiary treatment, discharging to the Speed River.

Biosolids are anaerobically digested and mechanically dewatered. The biosolids, which meet or exceed Ontario Ministry of the Environment Class B quality criteria, are applied to agricultural land, further processed within the facility's composting systems, or landfilled.

PHOTOS COURTESY OF CITY OF GUELPH WASTEWATER SERVICES DIVISION

Data obtained from process centrifuges are entered into a data management and trending program.

SEPARATE TRAINS

The Guelph operation uses four separate plants, all at one location, for primary sedimentation and activated sludge treatment. Each plant uses two separate liquid trains with dedicated primary clarifiers, aeration tanks and final clarifiers. Secondary treated effluent is directed to rotating biological contactors (RBCs), then to sandfilters, chlorinated and then dechlorinated before being discharged into the Speed River.

"The program allows us to balance the biomass, which means we know what's coming into the plant, what we're processing at each stage, and what's leaving the plant."
GERRY ATKINSON

The solids process is mainly composed of four digesters and a dewatering system that uses mechanical belt filter presses, which yield filter cake with typical solids content of 18 to 19 percent. Feed solids are conditioned with a polymer coagulating agent and further processed through woven mesh filter belts. The plant also operates a combined heat power system to heat its digesters and offset purchased electricity.

For years, the plant's nine operators relied on time-consuming traditional paper filter tests (also known as drying tests) to gauge the level of sludge mass in its primary clarifiers and the biomass in its aeration basins and final clarifiers. As with any plant, the paper filter tests provide accurate suspended solids percent readings. However, the Guelph team chose to augment the traditional test method when it adopted a more strategic approach to measure and balance its biomass in 2006, says operating lead hand Gerry Atkinson.

"We sample each of the two liquid streams once a day, which translates to a lot of samples," Atkinson says. "Given the number of samples, it took several hours or more to get the test results, which meant the operators didn't have the appropriate information to make the necessary adjustments in their areas of the plant until midday and they'd sometimes have to wait until the next day to see where more adjustments, if any, needed to be made.

"We wanted a faster way to get an accurate picture of the mass in any given tank so we can quickly determine the necessary adjustments for process control."

Guelph treatment plant team member Mike Innocente checks the amount of sludge that has settled after a centrifuge spin test.

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.

SPEEDING UP

To speed the testing processes and more accurately assess biomass, Guelph purchased four Raven F-10300 process centrifuges from Raven Environmental Products Inc. The centrifuges are designed for rapid determination of solids concentrations of mixed liquor in aeration basins, clarifier return sludge and waste sludge removed from activated sludge systems.

With the centrifuges in place, operators collect samples using a Raven Coretaker core sampler early each morning. In the lab, the samples are gently mixed and poured into centrifuge tubes. After air bubbles are removed, the tubes are placed in the centrifuge and the device spins for 15 minutes.

With the centrifuge test, solids are compacted to the bottom of the tube, which indicates the percentage of solids in a given tank. Based on the centrifuge percentage reading and the capacity of the tank being tested, operators calculate the sludge or biomass (sometimes referred to as a sludge inventory) in the tank.

Plant operators use the data to adjust various plant processes, such as sludge retention times (SRTs) in the aeration basins, secondary clarifier pumping removal rates in the primary clarifiers, hydraulic retention times, and wasting cycles, as well as return activated sludge (RAS) return rates, if needed. These adjustments help the plant achieve the optimum balance of biomass throughout the plant at all times.

MAKING ADJUSTMENTS

"For example, we used the centrifuge today and determined an abnormal amount of biomass in the final, which could denitrify if left in the final too long," says Atkinson. "We needed to get that biomass out of the final and back into the aeration basin where it needs to do its work. By quickly determining the mass balance, we adjusted our return activated sludge (RAS) rate to remove the excess biomass."

In addition to quickly providing an accurate picture of the biomass, Atkinson says the centrifuges enable the staff to quickly determine the effectiveness of the adjustments made.

"Within a short time of adjusting the pumping rates today, we then checked the mass balance again using the sampling techniques and the centrifuges," he says. "We found our adjustments corrected the problem. In the past, we would have to wait one or two days to see the effectiveness of the process changes, whereas now it takes hours." Whether it's the final clarifier or other tanks throughout the four separate plants, the centrifuges dramatically speed the testing process.

"We can make adjustments first thing in the morning," Atkinson says. "Then we can go back within a couple of hours after getting the results and quickly determine what's going on, whether our adjustments were the right ones, and whether we need to do something different."

In addition to the daily centrifuge tests, the staff continues to perform traditional paper filter tests once per week. It then compares paper filter tests taken over a four-week period with the results of centrifuge tests. To validate the accuracy of the spin tests, a series of conventional tests are performed on one set of samples every week. Doing so ensures the proper correlations are made between the tests, which differ slightly in how they convey results. It also ensures that the centrifuge samples are consistently accurate when compared with the traditional laboratory paper filter tests. The information from the tests is also entered daily into the plant's data management and trending program.

The primary advantage to centrifuge tests, says Atkinson, is daily control.

"Operators don't have to wait all that long to see the test results," he says. "It prioritizes where attention needs to be focused [to] make the appropriate process adjustments, which in turn gives them more control over the plant."

> "You can spend a lot of time testing and waiting for data. With the new centrifuges and sampling techniques, the data is available in minutes. From there, you plug in the information and go."
> **GERRY ATKINSON**

QUALITY DECISION-MAKING

The strategic approach to balancing biomass has proven to be a success. "The program allows us to balance the biomass, which means we know what's coming into the plant, what we're processing at each stage, and what's leaving the plant," Atkinson says. "It's one of many steps we've taken to enhance the overall operation of the plant, while also ensuring we consistently meet or exceed treatment standards established by MOE."

The Raven centrifuges, he says, play a key role in helping the plant accomplish its biomass balance objective. "With the centrifuges, the operator obtains the data needed within 10 or 15 minutes each day, so that he's able to make the necessary adjustments by 10 a.m. versus 2 p.m.," Atkinson says.

"Now, our staff is spending time interpreting data and making the necessary corrections much sooner for better overall biomass control. That gives operators better insight into the decisions they need to make."

Atkinson says the use of process centrifuges was a smart decision. "You can spend a lot of time testing and waiting for data," he says. "With the new centrifuges and sampling techniques, the data is available in minutes. From there, you plug in the information and go." tpo

Process Enhancements

MANUFACTURERS OFFER A VARIETY OF EQUIPMENT AND CONSUMABLES THAT INCREASE TREATMENT EFFICIENCY AND SUPPORT EFFECTIVE PERMIT COMPLIANCE

By Scottie Dayton

From chemistries to equipment, manufacturers offer a variety of solutions to help treatment operators enhance plant performance, save energy and stay in compliance with NPDES permits.

MATCHING FLOW TO DEMAND

The energy-efficient **Omega Frequency Control from Kaeser Compressors Inc.** uses engineered frequency drives to get the most out of positive-displacement blower packages. The control continuously adjusts the blower speed, matching blower delivery to the actual process flow demand.

Units also offer enhanced controls through various signal inputs, outputs and a Profibus connection. They work with vacuum transducers, pressure transducers and dissolved oxygen sensors. Complete control systems include process follower, parameterizing, programming and interconnecting wiring. This cost-effective technology is on 10- to 335-hp packages. **800/777-7873; www.kaeser.com/omega.**

MIXING MASTER

The **Model AQX mixer from ACUMIX** increases mixing capacity, minimizes tank floor space, and reduces shipping charges for chemical usage to replace ailing mixers or fill voids in flocculator trains. One unit mixes 4,000 gallons of magnesium hydroxide, 12,000 gallons of pH adjustment or neutralizer, 5,000 gallons of biosolids treatment (15,000 gallons if anoxic), 4,000 gallons of polymer used in day tanks, or 40,000 gallons flocculation with 16-foot-tall basin walls.

The quiet helical reductions are 96 percent efficient with an American Gear Manufacturers Association gear rating exceeding a 1.5 (24-hour day) shock factor. Statistical life of the bearings is more than 100,000 hours (11.4 years).

A compact, lightweight, heavy-gauge, corrosion-resistant housing with flexible motor coupling ensures alignment and absorbs inherent shock loads. The model uses high-pressure wash down class F-insulated energy-saving motors. Precision aligned in-tank or optional above-mounting base couplings provide easy installation. **800/683-2011; www.acumix.org.**

MICROWAVE ULTRAVIOLET TECHNOLOGY

The **MicroDynamics Series OCS 660 open-channel wastewater system from Severn Trent Services** meets all dose, log reduction and water quality requirements. It disinfects using microwaves that energize low-pressure, high-output ultraviolet lamps.

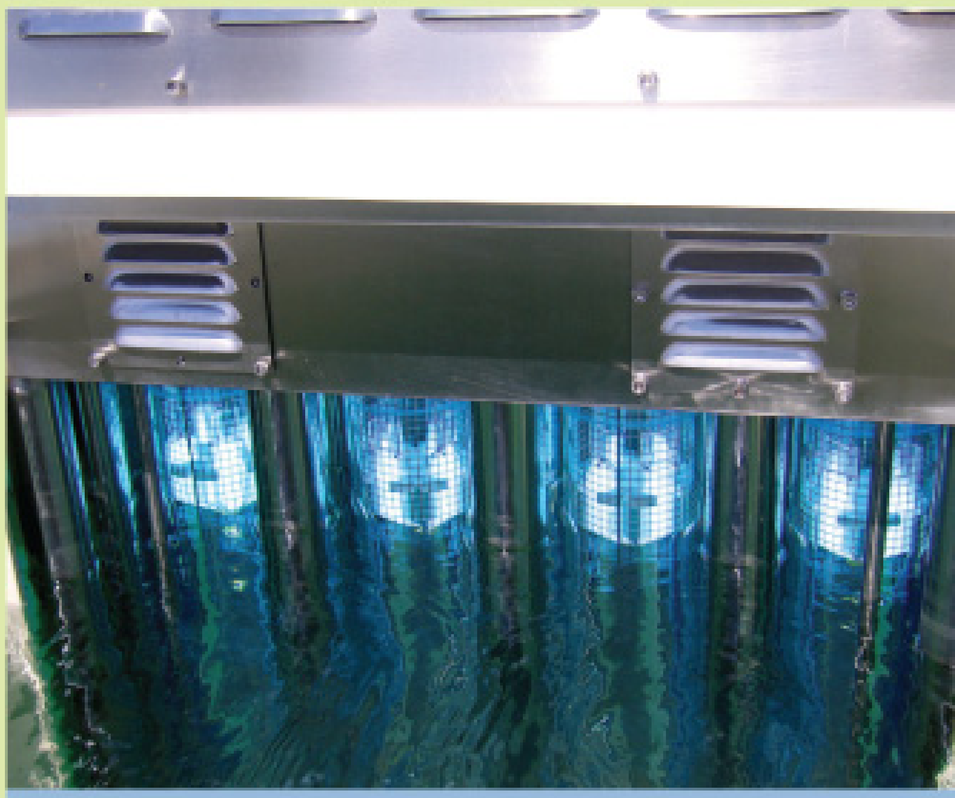
The long-lived lamps have no electrodes, light instantly, and switch on and off to match flow. Disinfection is immediate. Quartz sleeves remain the same temperature as the water, leading to less fouling and higher overall reliability. Units have no electrical connections in the water or between the microwave generator and lamp assembly. **215/997-4000; www.severntrentservices.com.**

ODOR AND CORROSION CONTROL

The **PRI-SC master program for hydrogen sulfide control from US Peroxide** eliminates odor and corrosion problems by combining iron salts with hydrogen peroxide in a synergistic fashion. The safer, more environmentally benign technology controls sulfides to very low levels, reduces solids loadings, accelerates reaction rates,

Omega Frequency Control from Kaeser Compressors

Model AQX from ACUMIX



MicroDynamics Series OCS 660 from Severn Trent Services

lowers iron consumption, and enhances flocculation in the clarifiers.

The peroxide regenerated iron-sulfide control strategy is most effective in large, long-duration municipal wastewater collection systems characterized by high sulfide loading rates and atmospheric hydrogen sulfide problems. The company's full-service program optimizes operational performance, provides measurable economic benefits, and integrates the collection system and plant. **877/346-4262: www.h2o2.com.**

CLAY-BASED FLOCCULANTS

RM-10 products from CETCO Oilfield Services Co. are a nonhazardous blend of sodium bentonite, pH-adjusting agents, polymers and other proprietary components that provide a safe, simple, cost-effective means for pretreatment and disposal of wastewater. More than 40 granular, semi-granular and powdered varieties are available. The formulas usually allow one-step removal of emulsified oils, heavy metals and suspended solids, ensuring that the treated effluent meets established discharge limits. **847/818-7917; www.cetcooilfieldservices.com.**

NO MEMBRANES

The EPA-approved luminescent **BOD system from Hach Co.** delivers quick, reliable measurements and reporting with time and date stamp, and operator and sample identification. Once calibrated, the units seldom need adjusting. They have no membranes, and no electrolyte to replace or anode to polish. Probes have a one-year sensor life, and the integrated motor-less stirrer is simple to replace. **800/227-4224; www.hqdmeter.com.**

BOD system from Hach Co.

MIXING SYSTEM

The **Depth Charge from Precision Systems** automatically scours lift stations before every pump cycle, preventing fats, oils and grease from damaging level controls or clogging pumps. The system resuspends solids by injecting a small volume of high-pressure air into the wet well immediately before the pump activates. The resulting turbulence mixes solids with water, then the energized pump removes them.

The unit has no moving parts, just injector bands mounted on the wall to minimize interference with other station components and increase the effectiveness of the injected air. The device works with any brand or type of pump. **708/891-4300; www.precision-systems.com.**

ENERGY-EFFICIENT

Ceramic Repair Putty from Devcon repairs or rebuilds worn or damaged process equipment quickly and economically by forming a smooth, long-lasting barrier against abrasion, corrosion, cavitations and chemical attack.

The durable alumina-filled epoxy reduces pump friction and energy consumption, while increasing water flow. Easily applied, it fills voids and improves the performance of pump casings, impellers, suction plates, tube sheets, heat exchangers, condensers, water boxes, valves, chutes, tanks, hoppers, fan housings and more.

The putty's 100-percent solids formulation produces no volatile organic compounds emissions. Non-sagging, it covers 66 square inches per pound at a thickness of 1/4 inch. Pot life is 25 minutes, and functional cure takes 16 hours at room temperature. When cured, it withstands service temperatures of 150 degrees F wet, 350 degrees F dry. The putty qualifies under military specification DOD-C-24176B(SH) Type I. **800/933-8266; www.devcon.com. tpo**

Depth Charge from Precision Systems

Ceramic Repair Putty from Devcon

people

Jim Utter is the new affidavit wastewater operator for the city of Mingo, Ill. The city is conducting sewer system work to reduce I/I, upgrading its main lift station, and looking into upgrading its two-cell facultative lagoon built in 1971.

Ellen Myers is the new environmental services manager for the city of Sioux City, Iowa. Her position involves overseeing the pretreatment program and working on the stormwater program.

Roger Kirby is the new wastewater superintendent for the city of Muscatine, Iowa.

Gary Schellhorn is the new interim Public Works director for the city of Clinton, Iowa. He also is the city's wastewater superintendent.

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.

associations

The Iowa Water Pollution Control Association established an ad hoc committee to advance the return of the water/wastewater curriculum in community colleges and expand the curriculum. The committee is working on ways of identifying, mentoring and providing summer employment and internships for prospective students, and funding scholarships. The drive is necessary if the industry is to have sufficient qualified personnel to replace wastewater staff as they retire.

awards

Alabama Water Environment Association

- Golden Manhole Award – Don Defoor, Haleyville WWTP
- Burke Award – Dan Miller, Huntsville Water Pollution Control
- Laboratory Analyst Excellence Award – Tony Fisher, Mobile Area Water & Sewer System
- Plant Excellence in Municipal Wastewater Treatment Award (<1 MGD WWTP) – Prudes Creek (Jefferson County)
- Plant Excellence in Municipal Wastewater Treatment Award (1-10 MGD WWTP) – Trussville (Jefferson County) and Turkey Creek (Jefferson County)
- Plant Excellence in Municipal Wastewater Treatment Award (>10 MGD WWTP) – Clifton C. Williams WWTP and Mobile Area Water & Sewer System

Iowa Water Pollution Control Association

- Arthur Sidney Bedell Award – Glen Petersen, superintendent, Iowa Great Lakes Sanitary District
- Harris F. Seidel Education Award – Kenneth Goering, superintendent, Fairfield Wastewater Treatment Plant
- Grade IV Operator Advancement Award – Mike Fields, Marshalltown Water Pollution Control Facility
- William Hatfield Award – Dennis White, Waterloo

Rocky Mountain Water Environment Association

- Arthur Sidney Bedell Award – Jenny Hartfelder, MWH Americas Inc., Broomfield, Colo.
- George W. Burke Jr. Award – Town of Erie, Colo.
- William D. Hatfield Award – Kevin Hill, Littleton/Englewood WWTP
- Laboratory Analyst Award – Kathryne Marko, City of Longmont, Colo.
- Analytical Merit Award – Elisabeth Norris, CH2M HILL OMI, Albuquerque, N.M.
- Biosolids Management Merit Award – Paul Heppler, 75th Street WWTF, Boulder, Colo.
- Collection System Award – City of Aurora Wastewater Division, Colo.: Richard Sims, City of Rio Rancho, N.M.
- Industrial Pretreatment Award – Neal Klimek, City of Rio Rancho, N.M.
- Plant Operations Merit Award – Bill Burks, Tri-Lakes Joint-Use Authority, Colo.; Anthony Martinez, CH2M HILL OMI Project, Grants, N.M.
- Plant Maintenance Award – Wayne Tsosie, City of Farmington WWTP, N.M.
- Plant Performance Award – Buena Vista Sanitation District, Colo.
- Quarter Century Award – Michael Boyett, Littleton/Englewood WWTP, Colo.

Water Environment Research Foundation

- Paul L Busch Award – Andrew Schuler, Ph.D., assistant professor in the Department of Civil Engineering, University of New Mexico.

education

EPA Publishes Nutrient Removal Report

The *Municipal Nutrient Removal Technologies Reference Document* from the U.S. Environmental Protection Agency helps utilities plan wastewater treatment nutrient-removal projects by using various reliable, cost-effective technologies. The two-volume report contains detailed technical information and costs for biological and physiochemical treatment processes, and nine case studies that examine factors for successful process design and operation. For a copy, visit the Publications section at www.epa.gov/owm/mtb.

Minnesota

The Minnesota Section CSWEA/MWOA Innovative Approaches to Wastewater Operational Problems Seminar is Feb. 24 at St. Cloud. Call George Sprouse at 651/602-1026 or visit www.cswea.org.

North Carolina

The North Carolina AWWA-WEA has these classes at North Carolina State University's McKimmon Center in Raleigh, unless stated otherwise:

- March 30-April 3 – Eastern Collection and Distribution School
- May 4-8 – Eastern Biological Wastewater Operators School
- May 5-8 – Physical and Chemical Wastewater Operators School
- May 12 – Microscopic Examination for Wastewater, Charlotte.

Call 919/784-9030 or visit www.ncsafewater.org. **tpo**

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

CALENDAR OF EVENTS

Jan. 25-28
New England Water Environment Association Conference, Marriott Copley Place Hotel, Boston, Mass. Call 781/939-0908 or visit www.newea.org.

Jan. 27
Biosolids Dewatering Specialty Conference, Carson, Calif. Call 510/382-7800, option 4, or visit www.cwea.org.

Jan. 28
Biosolids Dewatering Specialty Conference, Oakland, Calif. Call 510/382-7800, option 4, or visit www.cwea.org.

Jan. 28-29
Nebraska Water Environment Association Snowball Wastewater Conference, Holiday Inn, Kearney. Call Jeff Forney at 402/341-1116 or visit www.ne-wea.org.

Jan. 29-30
Southeast Regional Technology Transfer Conference, Westin Poinsett Hotel, Greenville, N.C. Call 803/939-9574 or visit www.weasc.org.

Feb. 1-4
New York Water Environment Association Meeting and Exhibition, New York Marriott Marquis. Call 315/422-7811 or visit www.nywea.org.

March 1-3
Pretreatment, Pollution Prevention and Stormwater Conference, Monterey, Calif. Call 510/382-7800, option 4, or visit www.cwea.org.

March 1-4
American Water Works Association Customer Service & Information Technology Conference, Westin Hotel, Charlotte, N.C. Call 800/926-7337 or visit awwa.org.

March 2-6
Texas Water Utilities Association Annual Meeting, Corpus Christi. Call 888/367-8982 or visit www.twua.org.

March 16-19
Illinois Water Environment Association Conference, Crowne Plaza, Springfield. Call Dennis Priewe at 815/387-7634 or visit www.iweasite.org.

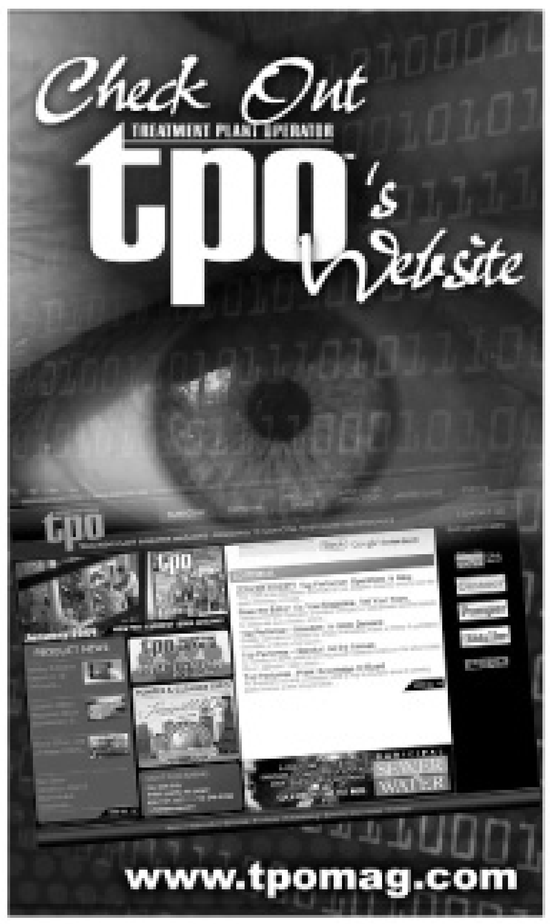
March 21-25
South Carolina Environmental Conference, Kingston Plantation, Myrtle Beach, S.C. Call 803/939-9574 or visit www.weasc.org.

March 22-26
Kentucky Water and Wastewater Operators Conference, Lexington Center and Hyatt Regency, Lexington. Call Melissa Brothers at 502/226-8149 or visit www.kwwoa.org.

March 25-26
West Virginia Construction and Design Exposition, Civic Center, Charleston. Call 304/342-3976 or visit expo@wvexpo.com.

March 29-April 1
Missouri Water Environment Association Conference, Osage Beach. Call Clara Haenchen at 573/634-6566 or visit www.mwea.org.

tpo Marketplace Advertising



THE SHINE MAY FADE, BUT THE PERFORMANCE ENDURES.

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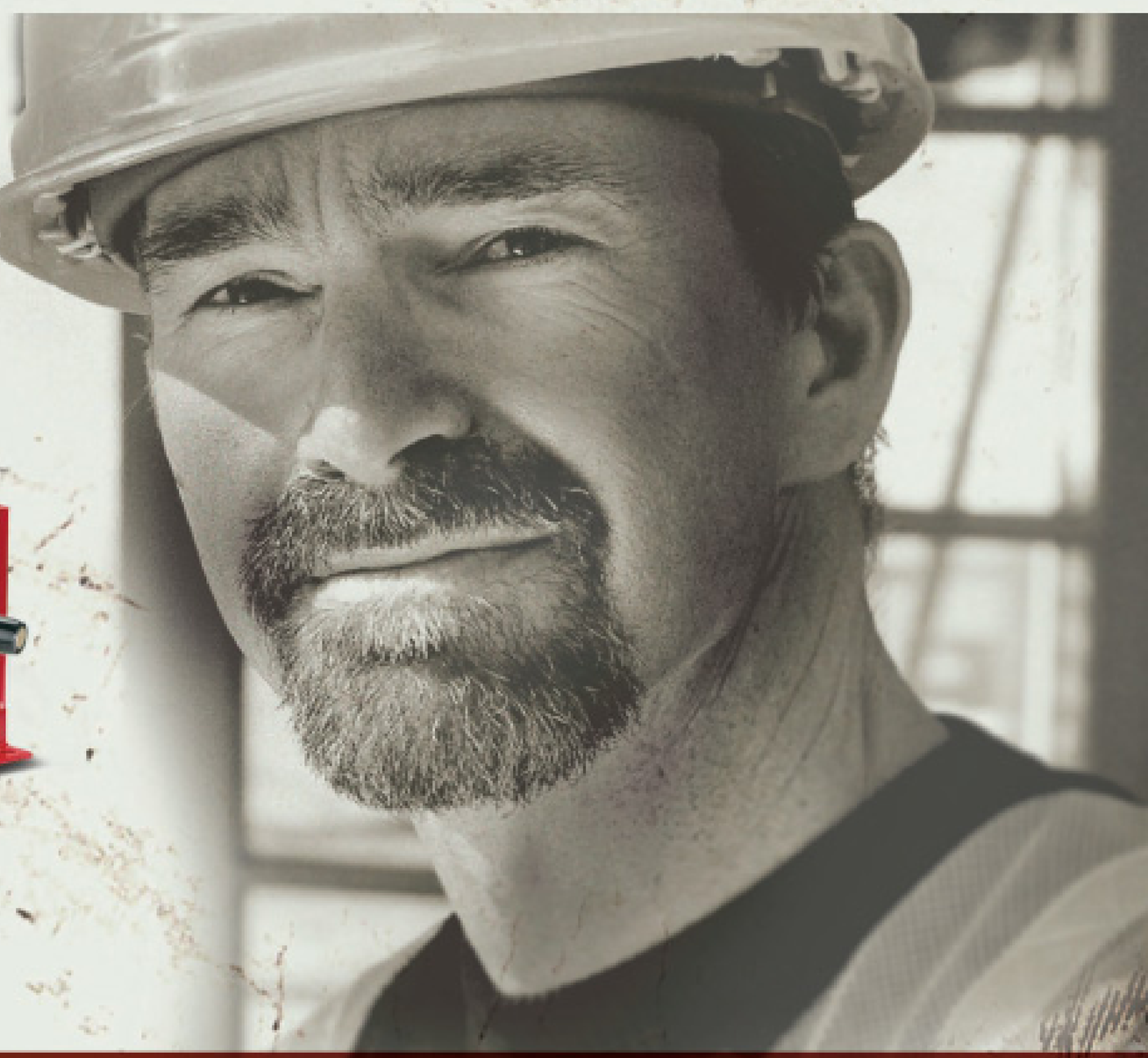

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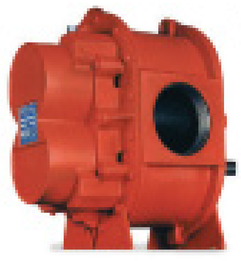

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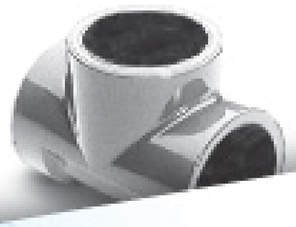

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