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INNOVATION FROM OPERATORS HELPS THE TOWN OF CREWE (VA.) TREATMENT PLANT CUT NUTRIENT LEVELS

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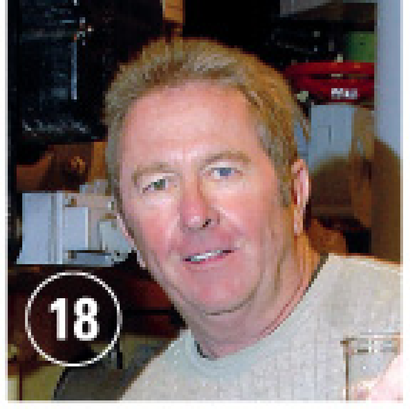

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on the cover

Town manager Wade Walker (front and center) is proud of his award-winning team at the Town of Crewe (Va.) Wastewater Treatment Plant. From left behind Walker are Class III operator Phil Pegram, plant manager John Hricko, chief operator Jason "Peanut" Lewis, and director of public works, Toney Shelton. (Photography by Joseph A. Mahoney)

let's be clear

Why I Love This Industry

NOWHERE ELSE WILL YOU FIND SO MANY CAPABLE, PASSIONATE, DEDICATED, DOWN-TO-EARTH PEOPLE — WHO ALSO HAPPEN TO BE GREATLY UNDERAPPRECIATED

By Ted J. Rulseh

Years ago I took a business trip to New York, and that triggered a complaint from my wife about all the wonderful places I got to visit without her.

I patiently explained that on this particular overnight, in-and-out trip, I would see nothing except an airport, a hotel room and the Edward P. Decher Secondary Wastewater Treatment Facility in Elizabeth, N.J., across the Goethals bridge from Staten Island. There, I would do research for a magazine story about the plant's digester gas-fueled cogeneration system.

Few people would consider that a glamorous assignment. It turned out to be a miserably hot summer day, and the road to the plant took me deep into an industrial area, about as unglamorous a spot as one could find. Yet 23 years later, I remember that visit fondly. Why? Because of Robert Nichol, then plant superintendent, and his staff, who made me feel completely welcome.

They gave me all the time I needed, describing their cogen process in detail and answering any question I cared to ask. Their pride showed everywhere, from the immaculate interior of the engine room, to the tiny but manicured piece of lawn and the flowers in planters near the office front door.

IT'S THE RULE

That has been the rule, not the exception, in my visits to treatment plants around the country. The experience is the same when I interview plant managers and operators by telephone. They always seem eager to talk about their plant; I never feel as if I'm being subtly rushed off the phone so they can get on with their day.

It's hard to imagine a profession in which the general public's perception of its people lands so far from reality. The picture of a treatment operator in the average person's mind is of someone with a soiled shirt who has a dirty job that no one else wants and isn't altogether thrilled to be where he or she is.

The picture I see is of people with considerable education and training and with highly specialized knowledge of complex processes; of people with skills that are rare and hard to replace; of people who know they're doing something important and can hardly wait to get to work in the morning.

For this month's issue, I had the pleasure of interviewing John Hricko, plant manager in the Town of Crewe, Va., and Butch Green, district manager for the Frisco Sanitation District in Frisco, Colo. Both fit my picture perfectly. Both also work in small communities, but the thing is, the size of the community or plant doesn't seem to matter — the egos don't inflate along with the population served or the daily design flow.

ALWAYS INNOVATING

Another thing that's striking about treatment plant people is how much they care about performance and efficiency, and how ingenious they are at solving problems and making improvements on their own for a fraction of what it would otherwise cost. Anyone who thinks public employees aren't good stewards of tax dollars should visit with the managers and operators we profile on these pages.

At the Edward P. Decher plant, Nichol talked proudly about a new engine control system that was cutting fuel consumption by 5 to 7 percent. Hricko and his staff designed a nitrogen-reduction solution that cost $10,000 in place of the $250,000 system proposed by consulting engineers.

At Frisco, Green and his staff, among many other things, solved an odor-control problem that engineers said would cost $850,000 — at a price tag of a few hundred, with nothing more than a creative rerouting of piping.

It seems people at every plant behave that way. Far from the stereotype of shovel-leaning public employees who do the bare minimum, these folks seem to do the absolute maximum with the resources they're given. And that means not just holding down costs but taking measures to beat permit requirements consistently.

Another thing that's striking about treatment plant people is how much they care about performance and efficiency, and how ingenious they are at solving problems and making improvements on their own for a fraction of what it would otherwise cost.

EASY TO LIKE

All that aside, it's simply hard not to like these people. Maybe it's a matter of personalities and shared interests — for example, many operators enjoy the outdoors and fishing, as I do. Or maybe it's just a genuineness that goes with working in a profession that by its very nature keeps a person humble.

At any rate, when after an interview an operator says to "be sure and pay us a visit sometime," I get the distinct impression he or she means it. And since Butch Green and his team work in the middle of the Rockies next to a big lake that's full of trout, maybe I'll test that theory on him someday.

I think I could get my wife to go along to a place like that. tpo

Finding New Operators

To the editor:

It is well known that there will be a lack of trained and qualified people to move up in the wastewater field to replace those of us who will be retiring in the next five to 10 years. Most of us experienced managers entered the field in the 1970s when the federal government first started funding wastewater treatment infrastructure.

Since then, in my opinion, there has been a very poor effort to train and recruit good people to fill the lower-level jobs in the field. I generally get someone, regardless of age, who is green, and I have to train and school them and then hope they stick around.

Sure, there are environmental science and engineering courses of study at every major university, but the graduates of those programs are not going to be the young men and women who will turn the valves at your treatment plant and learn the business from the ground up as they do.

I had a college degree when I started, but I was willing to take an entry-level position and actually got my training on the job. In my experience, that has not been the norm. The folks who do the day-to-day work usually come from elsewhere, often someone who is a relative of an employee or is politically connected. Sometimes it works out and sometimes it doesn't.

My suggestion is to teach environmental-related skills at the high school and vocational school levels just like auto mechanics and construction. There are other fields besides wastewater that could be rolled into the program as well, such as the water side of the business, site remediation, and basic laboratory technician skills.

This would be the get-your-hands-dirty type of job training that would prepare the next generation to fill those entry-level jobs and be in a position to move up the ladder. Our authority has had a program of reaching out to middle school students in our service area with poster and essay contests on the topic of clean water. We have had a very good response, and my hope is that those kids and their parents will begin to ask about a program of study when they get to high school.

Yes, there is stability in the profession, as it is not directly tied into the economy, but I wouldn't necessarily say that good pay and benefits will always be the norm. The costs of energy, employee benefits and other items go up whether in the public or private sector, but if you are good at what you do, chances are you will always have a job.

Dane J. Martindell
Plant Superintendent
Western Monmouth Utilities Authority
Manalapan, N.J.

Enjoying the Magazine

To the editor:

I just wanted to let you know how much my staff and I appreciate *Treatment Plant Operator*. It's one of the few magazines that gets passed around and read by the plant operators.

Steven E. Douglas
General Manager
City of York (Pa.) Wastewater Treatment Plant

More on Reclamation?

To the editor:

I enjoy reading a magazine strictly dedicated to wastewater operators. Keep up the good work. So many times, people don't realize the lonely operator who makes it work at these plants. Now with the greater demands on water conservation and reuse, I would like to see more in the magazine on reclamation facilities. We have just started it here at our plant. Like all good operators, we're always looking for ideas to improve our operation.

Keith M. Bootz
Second Shift Plant Operator
Water Reclamation Facility North
Sanford, Fla.

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A TREATMENT OPERATOR IN A SMALL KANSAS COMMUNITY REACHES OUT TO THE PUBLIC WITH A NARRATED VIDEO PLANT TOUR IN DVD FORMAT

By John K. Thompson

Matt Meeks, senior water and wastewater operator for the City of Maize in Sedgwick County, Kan., has created an educational DVD featuring a plant tour. (Photos courtesy of Matt Meeks)

It's another day on the job for Matt Meeks, senior water and wastewater operator for the City of Maize in Sedgwick County, Kan. And that means another chance to shoot a great video clip of the city's extended aeration wastewater treatment plant in action.

"My films are rated G — for grit, grime and grease," says Meeks. He discovered video as an economical and efficient way to educate people about the treatment process in this rural community of about 2,000 near Wichita.

His technique? Shoot narrated video and create DVDs to guide viewers and trainees through the intricate world of wastewater management. "I've always provided a standing invitation to anyone, especially science teachers, to come out for a tour," says Meeks.

"But I usually don't get many takers. So I chose to make, in essence, a video tour that can be taken in comfort at the viewer's convenience. Now I have a product that I can give to anyone who expresses the slightest interest in my vocation. My DVD makes the experience both interesting and safe for everyone involved."

A VIDEO TOUR

Meeks oversees the daily operations of the water and wastewater systems in Maize. His work with video began when he started shooting his son's grade school football games and doing play by play using slow motion and stop action. "At that point I spent about $1,000 to develop the ability to edit and manage video and burn it to a more durable medium," he says. "Then I started doing the highlight videos for the team. It's still my passion."

The application to wastewater came when Meeks realized that there is much the local public never sees when it comes to plant management. Video technology offered a way to bridge the awareness gap. He started experimenting with short videos of the various elements of the treatment process.

After several tries, he pulled together a narrated video plant tour that walks the viewer from the faucet, down Maize's sanitary sewer manholes, to lift stations, the treatment plant and on to final clarification and discharge. The tour provides viewers with colorful and detailed descriptions of plant machinery, processes and operations.

Other features of the video include narrated descriptions of typical hazards associated with routine maintenance of lines. It's all vital work that most citizens never see or hear about.

What's Your Story?

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

MULTIPLE APPLICATIONS

Beyond public education, the video offers a lot to learn for those involved in training. It's a cost-effective way to help new employees familiarize themselves with wastewater system maintenance issues.

"A vertical turbine pump is operated and maintained the same, whether it is in Ulysses or Maize," says Meeks. "A solids contact upflow reactor is doing the same thing whether it is in Park City or Hillsboro. As I do the taping of such maintenance, I'm also learning the importance of focusing on and cataloging subject-specific clips."

Meeks also sees value in documenting and distributing plant operations videos. "I don't so much host viewings of the DVDs, but mostly give them away for people to use as they wish," he says. "I estimate the product costs about $1.25 each to produce. So far, there are several hundred copies floating around Kansas and at least one

Meeks (right) takes a sample from the final clarifier while his son, Caddo, records video images.

copy in Texas, Colorado, New Mexico, Hawaii and Wisconsin."

For the visiting public, there is value as well. "They provide a ready supply of souvenirs for plant visitors," Meeks notes. "They represent a giving of a part of myself and are very personal because of that."

GREAT POTENTIAL

For Meeks, the future offers many creative possibilities for new video projects. "A few weeks ago I saw another perfect event to record," he says. "We had a high-pressure sewer line plug off. In my 20 years of experience, I have never seen this happen. We determined that the pumps were fine and the pipeline was plugged somewhere in its 2-mile run.

> "[The DVDs] provide a ready supply of souvenirs for plant visitors. They represent a giving of a part of myself and are very personal because of that."
> **MATT MEEKS**

"We isolated the likely problem area by tracing pressures along the pipeline, an exercise in raw logic. We dug up a valve and removed the bonnet for inspection and cleaning. How many city staff knew that could be done? Had I filmed it, we would have captured the bank of the excavation sloughing into a pool of raw sewage beside where I was working, giving me a quick dip. Such are the hazards of excavation."

If trends indicate the direction video training is going, creative operators like Meeks may be on to something. According to a press release from comScore Video Metrix Service, U.S. Internet users viewed 14.5 billion online videos in March 2009, representing an increase of 11 percent versus February. **tpo**

top performer: **PLANT**

THE TOWN OF CREWE (VA.) WASTEWATER TREATMENT FACILITY USES INNOVATION TO REDUCE NUTRIENT LEVELS IN EFFLUENT AND HELP PROTECT THE CHESAPEAKE BAY

A Little *Creativity*

By Ted J. Rulseh

profile

Town of Crewe (Va.) Wastewater Treatment Facility

BUILT:	1956
UPGRADED:	1997
TREATMENT LEVEL:	Secondary
TREATMENT PROCESS:	Activated sludge/oxidation ditch
POPULATION SERVED:	2,400
FLOWS:	Design 0.5 mgd, average 0.3 mgd, peak 1.25 mgd
RECEIVING WATER:	Deep Creek (to Appomattox River, to Chesapeake Bay)
BIOSOLIDS:	Dewatered by belt press, landfilled
PLANT MANAGER:	John Hricko, class I
OPERATORS:	Chief operator Jason Lewis, class III; Phil Pegram, class III

Creative modification to the oxidation ditch treatment process helped the Town of Crewe deliver needed nutrient reductions. (Photography by Joseph A. Mahoney)

WHEN THE TOWN OF CREWE, VA., UPGRADED ITS wastewater treatment facility in 1997, it was designed for traditional treatment, removing BOD and TSS. Then along came nutrient loading requirements designed to protect the Chesapeake Bay, to which the plant's receiving stream ultimately flows.

Plant manager John Hricko (pronounced RICK-o) and his team would have to operate under a General Permit for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed. That meant making changes in the secondary treatment process.

Local engineers devised a plant upgrade that would have cost at least $250,000 — a big burden for a community of just 2,400 people. Then Hricko and chief operator Jason "Peanut" Lewis came up with adjustments to the oxidation ditch process that would enable the plant to meet the nutrient requirements for less than $10,000.

Hricko and Lewis installed the improvements themselves, reducing nitrogen discharges by more than 50 percent on average and bringing the plant into compliance with the new permit, which took effect in January 2007. Even better, the plant is in position to sell nutrient reduction credits in a market that will become active in 2011.

These achievements helped the facility earn a 2008 Wastewater Treatment Plant of the Year award from the Virginia Rural Water Association. In addition, Hricko and Lewis were honored as Wastewater Operators of the Year.

Class III operator Phil Pegram checks the dissolved oxygen in an oxidation ditch channel using a portable DO meter from YSI Inc. as chief operator Jason "Peanut" Lewis looks on.

Lewis checks the nitrogen content in a lab test of an effluent sample.

CLAMPING DOWN

The Town of Crewe lies about 60 miles southwest of Richmond, the capital of Virginia. The wastewater collection system includes 11 miles of sewer mains and eight pumping stations. The treatment plant process includes screening and grit removal, an oxidation ditch (Siemens' Orbal process), two secondary clarifiers, phosphorus removal by addition of liquid alum, disinfection (chlorine gas), and post-aeration (cascade steps).

A Roediger belt filter press served by two 100-gpm Moyno progressive-cavity pumps dewaters digested biosolids to 16 to 18 percent solids, and the material (7 dry tons per week) is sent to a landfill.

Nitrogen and phosphorus limits on Virginia wastewater treatment plants are part of an effort under the Chesapeake Bay Program to reduce nutrient enrichment, a major cause of water-quality impairment in the bay and its tributaries.

> "At the time, the designers weren't looking at nutrients. The purpose of grit channel aeration was to freshen the influent. We had the air in all three oxidation channels as high as possible, because total nitrogen had never been a concern."
>
> **JOHN HRICKO**

Under its new permit, the Crewe treatment facility has an annual waste load allocation of 9,137 pounds of total nitrogen and 761 pounds for total phosphorus. At design flow (0.5 mgd), this means a total nitrogen concentration of 6.0 mg/l and a total phosphorus concentration of 0.5 mg/l in the effluent.

When Hricko arrived as plant manager four years ago, the town was just exploring how to meet the nutrient requirements. The plant had been upgraded as an entirely aerobic facility, with aerobic sludge digestion and even an aerated grit channel at the head end. "At the time, the designers weren't looking at nutrients," says Hricko. "The purpose of grit channel aeration was to freshen the influent. We had the air in all three oxidation ditches as high as possible, because total nitrogen had never been a concern."

TAKING A LOOK AROUND

The Town of Crewe's key challenge was nitrogen removal. "When Jason and I started looking at it, the town leaders were thinking we would have to go through an engineer and have a major overhaul," says Hricko.

The plant uses a three-channel oxidation ditch with two sets of discs, one on each side, each one crossing all three channels and using a single shaft

John Hricko shows off the clarity of the water in the chlorine tank.

Town of Crewe Wastewater Treatment Facility
PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT
BOD	200-300 mg/l	ND	12 mg/l
TSS	250 mg/l	1.7 mg/l	12 mg/l
TKN	45 mg/l	< 1.0 mg/l	3 mg/l monthly avg.
Total N	45-50 mg/l	3.33 mg/l	6.0 mg/l monthly avg.
Phosphorus	8 mg/l	ND	0.5 mg/l annual avg.
pH	7	7.3-7.4	6.0-9.0
DO	--	9 mg/l	5.0 mg/l
Zinc	300-500 ppb	34 ppb	70 ppb

ND = Non-Detectable ppb = parts per billion

and one motor. They had proposed using discs on separate shafts for the three ditches and installing variable-frequency drives to provide finer control of aeration.

"The town was looking at whether it might be more cost-effective to buy nutrient reduction credits than to pay for the upgrade," says Hricko. "We visited some other facilities in the area to see what they were doing. Our aim was not to install the same equipment they were using but to mimic the basic treatment technology within our plant.

"We came up with the idea that if we could get a reduction in dissolved oxygen in the first ditch, yet maintain a high enough DO in the last ditch where we needed aerobic conditions, we might have some success."

A typical oxidation ditch process keeps DO levels at less than 0.5 mg/l in the outer channel and from 1 to 3 mg/l in the inner channels. However, Hricko and staff found that when they lowered DO levels to improve denitrification, the level of total Kjeldahl nitrogen increased. So they looked for an economical way to control DO in each channel to improve denitrification while also reducing TKN.

One common way to accomplish that is to remove some aeration discs in the first ditch to reduce aeration and lower the DO level. But Hricko and Lewis found that that reduced the mixing velocity and led to settling of solids on the basin bottom. Operating the aeration motors in on/off cycles brought only marginal results in reducing DO.

The next approach was to toggle the disk motors between their low and high speeds at specified intervals. "We started out in a manual switching mode, going from high to low for a period of hours, and then back to high," Hricko says.

AUTOMATING THE SOLUTION

When that solution showed promise, Hricko sought and won approval from town manager Wade Walker for a proposal to automate it at a cost of about $10,000.

The system uses a simple Precision Digital PD690 level/process controller in a feedback loop with a GLI International Pro-D3 DO transmitter fitted with a GLI Series 5500 DO sensor. The transmitter's 4-20 mA signal, directly proportionate to the DO level measured in the ditch, is looped through the controller.

By trial and error, Hricko and Lewis determined that the most effective place for the DO probe was in the third channel. Experience had shown that when DO there fell below 3.0 mg/l, TKN increased significantly. Experimentation revealed the set point range that best balanced control of both total nitrogen and TKN.

"The PD 690 has four control relays," says Hricko. "Because we have two aeration motors, 180 degrees apart, we use different DO set points for each. On the low side, we have the set points of 3.3 to 3.6 mg/l, and

ALWAYS INSTRUMENTAL

John Hricko, manager of the Town of Crewe Wastewater Treatment Facility, has earned a name in his area for creativity with instrumentation.

It started during the 10 years when he worked as chief operator in water and wastewater for the nearby Town of Blackstone, and he now applies what he has learned to his own facility and to help other communities.

Hricko checks the aeration speed control, a key piece in saving thousands of dollars for the Town of Crewe treatment plant.

"About 13 years ago, while in Blackstone, I began taking classes and working with instrumentation, out of necessity," Hricko says. "We had upgraded the plants, and much of the instrumentation was no longer under warranty. We couldn't find anyone local to work on it, so I began my career.

"Word spread about my doing instrumentation and controls, and soon I was doing work for other facilities in our area. I do what I can as time allows. I also supervise and am in the process of training two new operators for the water and wastewater treatment plants for the Town of Keysville. Time is sparse to say the least!"

"We got immediate results with this approach, and each year we're getting better and better. So far, for this year, we have about a 60 percent reduction in total nitrogen over the numbers we had before installing the system. We've also benefited from reduced power costs, as previously both motors always ran on high speed alone."
JOHN HRICKO

An aquarium in the office is filled with plant effluent in which tropical fish thrive.

PROOF POSITIVE

The Town of Crewe Wastewater Treatment Facility has a dramatic way of showing visitors the high quality of its final product.

A 26-gallon aquarium inside the plant building entrance holds several varieties of tropical fish. Each week, the plant staff replaces the water with fresh plant effluent. "All the fish have flourished since we set up the tank in September of 2008," says plant manager John Hricko. "The tank always gets a great deal of attention from visitors."

on the high side, 3.8 to 4.1 mg/l. With these set points as the control, each side's motor runs on high speed until the upper DO limit is reached, at which time the speed switches to low.

"The motors then run on low until the lower DO limit is reached and they switch back to high speed," Hricko explains. "Control is with a narrow range for each side, yet it is very effective in achieving our goals.

"Normally, in the colder months, the low side runs on low almost continuously, as the DO content of the colder water stays in the high-side range. So while the low side stays on low speed, the high side toggles speeds and maintains that 3.6 to 4.1 mg/l range throughout the ditch.

"We got immediate results with this approach, and each year we're getting better and better," Hricko says. "So far, for this year, we have about a 60 percent reduction in total nitrogen over the numbers we had before installing the system. We've also benefited from reduced power costs, as previously both motors always ran on high speed alone."

The staff monitors the DO level in all three channels using a portable DO meter from YSI Corp. They also use that meter daily to calibrate the inline DO probe.

ADDITIONAL MEASURES

Regular laboratory testing helped the Town of Crewe staff fine-tune the process. They performed daily total nitrogen tests in-house and sent daily samples to an outside lab for expedited TKN testing. The daily testing regimen continued for about a year, until the staff felt the process was sufficiently controlled to yield consistent nitrogen reduction in compliance with the permit.

Beyond DO control in the ditches, the staff took other steps to reduce total effluent nitrogen. These included:

Carbon addition. Testing showed that influent BOD was not sufficient to feed the denitrifying bacteria in the ditch. By performing CBOD analysis, the staff found that adding a carbon source to the second channel would aid denitrification. They chose dry molasses as an inexpensive food source and gradually adjusted the quantity until they found the optimum level of 100 pounds per day.

Alkalinity increase. Hydrated lime added to the first channel at 100 pounds per day maintains sufficient alkalinity for nitrification. (The alkalinity has the added benefit of increasing hardness to precipitate zinc, which is present in influent at 300 to 500 parts per billion and must be reduced to 70 ppb or less for compliance.)

Sidestream flows. The staff found that influent nitrate levels increased when they operated the belt filter press or decanted the aerobic digester. To combat that, the staff installed timers to enable regular on/off cycles on the digester aeration system (two hours on, one hour off). This reduces nitrate before it enters the influent.

Grit channel modification. Aeration of the grit channel was increasing DO levels in the first oxidation ditch channel. "We cut that off, and now the influent DO numbers have dropped to where that first ditch is almost in an anoxic condition," Hricko observes. "It's never above 0.2 mg/l, and it usually stays below 0.1 mg/l. That's about as good as you can get for nitrate reduction."

Piping changes. The staff extended influent and return activated sludge piping so that both discharged below the surface, reducing surface agitation that had been introducing oxygen.

SET UP FOR THE FUTURE

Hricko notes that the Town of Crewe plant achieved compliance with its nitrogen limits in 2008 and will be able to sell nitrogen reduction credits when the market opens in January 2011. He estimates those credits will bring $20,000 to $25,000 in annual revenue to the town. "Instead of having to purchase credits or pay for a major plant upgrade, we have positioned ourselves to create a little bit of money," he says.

Hricko is quick to credit his team, which in addition to Lewis includes class III operator Phil Pegram, a team member for two years. "Both these men are tremendous assets to our facility," he says.

Lewis, an 11-year staff member, provided valuable insights during the nitrate reduction project. "Jason and I did research at other facilities together," Hricko says. "He provided the kind of fresh perspective that is always helpful. Having been here much longer, he had a better grip on what had been tried in the past and whether ideas I had would be likely to work."

Hricko also offers gratitude to town leadership: "Town manager Wade Walker was a huge help in having the confidence to let us do this. Public works director Toney Shelton was always there to help whenever we needed anything. Everybody really pulled together to help us come up with good results." tpo

more info:

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414/355-3601
www.gliint.com

Moyno Inc.
877/486-6966
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Precision Digital Corp.
800/343-1001
www.predig.com

Roediger Pittsburgh Inc.
412/487-6010
www.roediger.com

Siemens Water Technologies
866/926-8420
www.water.siemens.com

YSI Inc.
800/897-4151
www.ysi.com

At night, five 5,000-watt metal halide fixtures shine on each digester. A blue filter affixed to the energy-saving bulbs conveys the idea of water. Blue uplighting and downlighting on other buildings visually tie the whole plant together while providing task lighting.

Part of the Skyline

THE NEWTOWN CREEK WASTEWATER TREATMENT PLANT IN BROOKLYN, N.Y., ILLUMINATES ITS DIGESTERS IN A VISUALLY STUNNING CAP TO 10-YEAR UPGRADE

PHOTOS COURTESY OF NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

By Mary Shafer

The signing of the federal Clean Water Act in 1972 was the beginning of a long journey for the Newtown Creek Wastewater Treatment Plant in Brooklyn's Green Point neighborhood.

Thirty-seven years later, the plant has transformed from an overburdened, under-productive eyesore into a visually magnificent, contemporary wonder hugging the waterway between Brooklyn and Queens.

The plant's most striking feature is its new digester eggs, 145 feet tall and 80 feet in diameter. Their low-reflectivity stainless steel cladding prevents dangerous glare for the area's heavy aviation traffic.

To complete the visual effect, a lighting arrangement, designed by artist Hervé Descottes of American-French company L'Observatoire International, shines five 5,000-watt metal halide fixtures on each digester. A blue filter affixed to the energy-saving bulbs conveys the idea of water. Blue uplighting and downlighting on other buildings visually tie the whole plant together while providing task lighting at night.

MAKING IT NEW

The digesters are only the most obvious of many improvements at the treatment plant — cosmetic and functional. Around 1980, the city began looking at a Newtown Creek upgrade, but it wasn't until 1998 that the process actually began. In that year, the property was expanded to 53 acres to accommodate a more modern plant.

Newtown Creek is the city's largest wastewater treatment plant, serving about one million residents within 25 square miles and treating 18 percent of the city's wastewater with a dry-weather flow of 310 mgd. Upgrades will eventually raise wet-weather capacity to 700 mgd to serve a projected 1.33 million residents by 2045.

The upgrades include a visitor center and a quarter-mile Waterfront Nature Walk that provides views of the city and surrounding landscape. Designed by environmental sculptor George Trakas, the walk is designed "to evoke the rich, continually evolving environmental, industrial and cultural histories of the local area," according to *The New York Times*. It was funded through the New York City Department of Cultural Affairs' "One Percent for Art" program.

PHASED CONSTRUCTION

The plant has remained on line throughout design and construction, phased over a decade. Visual ordering of the site is achieved through carefully planned and placed building forms, materials and color, along with perimeter fencing, aerial walkways and bridges. Large glass areas provide natural light in machinery rooms.

The exterior also includes a "One Percent for Art" component. Green-space buffers between the facility and the street helped the plant win two awards for Excellence in Design from the New York City Art Commission for responding sensitively to the challenge of locating a large industrial project in a residential neighborhood.

In September 2007, New York Department of Environmental Protection opened the completed Waterfront Nature Walk, giving the pub-

Share Your Ideas

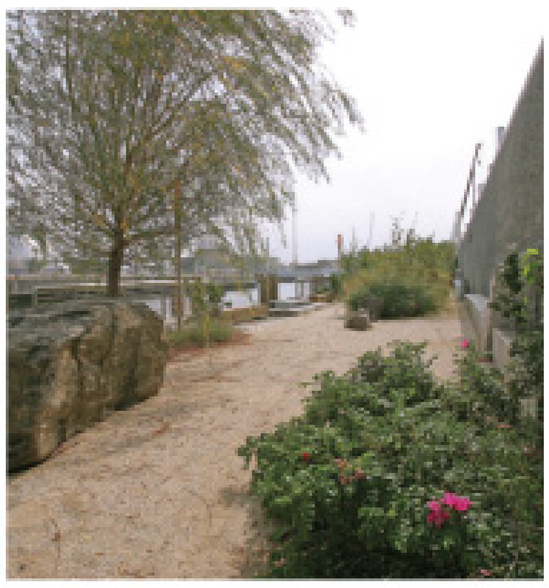
***TPO* welcomes news** about interesting features of your facility's grounds, signage or buildings for future articles in the PlantScapes column. Send your ideas to editor @tpomag.com or call 877/953-3301.

The plant's most striking feature is its new digester eggs, 145 feet tall and 80 feet in diameter. Their low-reflectivity stainless steel cladding prevents dangerous glare for the area's heavy aviation traffic.

lic its first waterfront view of Newtown Creek in decades. It also fit in with Mayor Bloomberg's PlaNYC goals to ensure broader public waterfront access and increase water quality throughout the city.

The eight digesters, which process up to 1.5 million gallons of biosolids daily, were welded on site. Structural pieces were brought from Texas and fabricated by Chicago Bridge & Iron Co. It took three months to assemble each one. The first four came into service in April 2008 and the rest were on line by year's end.

Response to the digesters has been tremendous, according to plant superintendent Jim Pynn. "The project has huge public appeal, and we've had lots of interest from trade and consumer publications," he says. "*The New York Times* has covered us several times, and there are lots of people blogging about it. We've even had inquiries from film scouts about using the plant as a movie set."



The plant's quarter-mile Waterfront Nature Walk provides views of the city and surrounding landscape.

Indeed, the plant was used as a backdrop in a recent anti-litter TV spot. As NYDEP commissioner Emily Lloyd told the *Times*, "This stunning plant demonstrates that with care, even the most utilitarian infrastructure can be an exciting and inviting neighbor." **tpo**

> "This stunning plant demonstrates that with care, even the most utilitarian infrastructure can be an exciting and inviting neighbor."
>
> **EMILY LLOYD**

top performer: **OPERATOR**

PROUD TO BE THE SEWER GUY

BUTCH GREEN AND HIS TEAM AT THE FRISCO (COLO.) SANITATION DISTRICT KEEP THINGS SHIP-SHAPE FOR RESIDENTS AND TOURISTS IN A SMALL ROCKY MOUNTAIN COMMUNITY

By Ted J. Rulseh

THE TOWN OF FRISCO (POPULATION 2,800) LIES AMID THREE MAJOR SKI resorts in Colorado. That means district manager Butch Green and his team at the Frisco Sanitation District have a dual challenge.

First, they need to keep sending clean effluent out to the Lake Dillon reservoir even on special holidays that can attract more than 20,000 tourists. Second, they need to be essentially invisible. They succeed admirably on both counts.

The 2-mgd (design) activated sludge treatment plant consistently meets its BOD and TSS limits as well as a stringent phosphorus limit that requires advanced water treatment (AWT) units. And tourists rarely notice the plant, even though it lies at the end of Main Street, a short walk from a marina, shopping and condominiums.

Green says the credit goes to the members of his staff: Mike Signorelli, Emily Moore, Brent Riisager and Loren Mendenhall. "Any manager worth his or her salt will tell you that without properly trained and knowledgeable people to operate it, the best equipment in the world won't make much of a difference," says Green.

"Our board of directors realizes that and provides an aggressive ongoing education program. The district is able to keep costs down and keep the plant performing at a high level because everyone on our team is accomplished in what they do, and each can cover for the other. That's the secret to our success."

Butch Green, district manager of the Frisco Sanitation District, takes pride in his role protecting the Lake Dillon reservoir. (Photography by Mark Fox)

RURAL ROOTS

Green, a Kansas native, started professional life working on a small community's electric utility. In 1974, when the community's wastewater operator resigned, local leaders asked Green to take over the plant.

Green, then 24, said yes. He worked there for five years while farming on the side. "Since then, everybody has known me as the Sewer Guy," he says. "I would set up the sewer plant in the morning. We would farm all day. Then I would go back and work at the sewer plant at night."

Green then moved to Colorado and worked through most of the 1980s at the Upper Thompson Sanitation District in Estes Park, Colo., and at Summit County's Snake River Wastewater Treatment Plant, across Lake Dillon from Frisco.

When he came to the Frisco district in 1989, "It was in sad physical and financial shape," Green recalls. To make repairs and bring the facilities up to date, the district had to raise user fees by more than 80 percent and increase taxes 360 percent. That process was far from painless: Some residents strongly opposed the project.

"In those early years, I was out in front of anybody who would listen to me to explain our plans," Green says. "When you undertake a project like that, there's always a certain segment of the community that wonders if you really know what you're doing.

"So I took the 10 most vocal of those folks, put them on an advisory committee, brought them down here to the plant and said, 'Look, here it is. What do you think?'

"Our old system was a package plant, and it had a wooden structure over the top of it because otherwise it would freeze. While we were standing inside there, looking at what we should do about that structure, a piece of it fell off the roof and hit one of the committee members in the head. In the end, they actually voted to spend a little more money than I was asking for."

"Any manager worth his or her salt will tell you that without properly trained and knowledgeable people to operate it, the best equipment in the world won't make much of a difference."

BUTCH GREEN

Green and assistant district manager Mike Signorelli look over the aeration basin.

profile

Butch Green, Frisco (Colo.) Sanitation District

POSITION:	District manager
EXPERIENCE:	35 years (20 in present position)
RESPONSIBILITIES:	Treatment plant, collection system, phosphorus removal plant
EDUCATION:	Two-year Associate of Arts degree; two-year degree in water/wastewater, Red Rocks College, Denver
CERTIFICATIONS:	Class A wastewater, level 4 collection system, level 1 laboratory
AWARDS:	Distinguished Manager Award, Special District Association, 2002 and 2006
GOALS:	Continue to produce quality effluent at reasonable cost

TAKING CONTROL ANYWHERE

The Frisco Sanitation District staff uses a SCADA system to control multiple plant functions — and do it from just about anywhere.

"We have a homemade system," says district manager Butch Green. "Mountain Peak Controls out of Denver helped us build it. They recently told me that our SCADA system has more adjustable timers in it than any plant they've ever seen. Every time we think of something new, we have them come up here and reprogram the system so our people can do what they want to do."

Among its benefits, SCADA has made life easier for the staff. "Back in the 1990s, if we got an alarm call at night, we had to come down here and see what was wrong," says Green. "After we added SCADA, we were able to use a PC Anywhere program that allowed us to hook into the system from home, so we could see what the problem was and tell the treatment plant to change a process or shut something down.

"That cut down our call-out time by maybe two-thirds. About five years ago, we put that program on our laptops, so that we didn't even have to be at home anymore to check on the system. In the last year, we discovered a program that allows us to use Blackberry devices to run the whole thing out of our pockets.

"Anywhere we can get a signal, even if we're on the lake fishing, we can hook into the data system and tell the plant to do something. Our pump stations are the same way. They all tie into SCADA, so we can download information on what they're doing."

Butch Green, who started out as an electric utility worker and farmer, now is proud to be known as "the Sewer Guy." Here he takes a sample of treated effluent water.

MAKING STRIDES

The original treatment plant, built in 1968, the same year the sanitation district was formed, consisted of lagoons. A small built-in-place activated sludge plant built in 1973 was replaced with a larger Cantex package plant in 1975.

A major upgrade in 1985 added AWTs for phosphorus removal, as well as sidestream equalization, a headworks, and maintenance buildings. In 1992 the Cantex package plant was converted to aeration basins, the sidestream equalization basin was converted to a digester, two new clarifiers were built, the AWTs were upgraded, and other improvements were made.

Additional blowers and new diffusers were installed in the digester and aeration basins in 2002, and AWT equalization basins were installed in 2008. Another upgrade in 2010 is to include UV disinfection.

Along the way, Green and the board of directors have set about finding employees with multiple skills and automating treatment systems using a SCADA system. Those successful endeavors enabled user fee reductions in 1996, a 38 percent cut in district taxes in 2003, and elimination of taxes in 2004. User fees today are lower than in 1994.

Green and four staff members now run the entire treatment facility, along with a 21-mile collection system with seven lift stations. "Our engineers, Black & Veatch, suggested in 1994 that we should have eight or nine employees for an operation this size," Green says. As it stands, each staff member wears multiple hats.

Frisco Sanitation District
PERMIT AND PERFORMANCE SUMMARY

	INFLUENT	EFFLUENT	PERMIT
BOD	250 mg/l	1.3 mg/l	30 mg/l
TSS	250 mg/l	1.6 mg/l	30 mg/l
Ammonia	TBD	< 1.0 mg/l	30 mg/l
Phosphorus	22 mg/l	0.039 mg/l	0.5 mg/l
pH	7	6.3	6.0 (min.)
Fecal coliform	–	0-30	143 monthly avg. 286 peak day

SPECIAL TALENTS

Signorelli, a seven-year team member, is assistant district manager and also laboratory director, chief operator, operator in responsible charge, collection system inspector, and IT specialist. He holds class A wastewater, level 4 collection system, and level 1 laboratory certifications. "Mike is a do-everything employee," Green says. "He has a degree in chemistry, so he understands how it all works."

Moore (eight years) serves as office manager, operator 2, and laboratory technician, and holds class C wastewater certification. "Emily was our weekend operator before 2003 when the office position opened up," says Green. "She continues to take a share of the daily process control every week, takes standby nighttime and holiday call-outs, and helps in the collection system when asked. In her office function, she is just a delight. When customers call here, they're just enamored with talking to her."

Riisager (five years) functions as maintenance manager, operator 1, and collection system operator and inspector. He holds class D wastewater certification and has passed the level 1 collection system exam. "Brent is a key reason we can operate a system this size with so few people," says Green.

Green, with team members (from left), office manager Emily Moore, assistant district manager Mike Signorelli, and operator Loren Mendenhall.

ALWAYS RESOURCEFUL

Staff members at the Frisco Sanitation District wastewater treatment plant have turned heads with their time-, money- and labor-saving initiatives. Here are just a few examples, provided by district manager Butch Green:

Among the most striking was an odor-control system for the solids-handling building, created for a few hundred dollars after engineers estimated the cost of such a project at $850,000. Originally, intakes for the process air blowers came from outside, through the blowers into the aeration basins, and the digester vented to the outside.

"Our team found a way to shut off the outside-air intakes, drawing the blower air from inside the solids-handling building back from the aeration basins and digester through the blowers, and back to the basins again," says Green. "It's basically a loop system: The air we put into the aeration and digester basin is recycled."

Here are a few other examples:

Phosphorus treatment. The mixed media end of the filter in the AWTs uses water surface wash during backwash. The staff built a high-pressure air scour addition to the surface wash to further clean the media, at a cost of $5,000, versus a price in the range of $150,000 for a factory-built system.

pH control. The team built pH probes into the effluent tanks to turn on the alkalinity system automatically through SCADA if the pH falls too low.

Collection system. The staff, working with Tetra Tech engineers, built a mapping and capacity monitoring system for the collection system to locate capacity velocity pinch points. They also built a crane on the back of the trailer-mounted waterjetter to hoist operators in and out of manholes without a confined-space tripod.

"He can fix anything. He single-handedly keeps all the equipment running in the treatment plant and the pumping stations. He shares in the daily process testing and plant adjustments, and he manages our collection system maintenance program, cleaning one-third to one-half of the system each summer."

Mendenhall, who serves as operator 1, joined the team in summer 2008 and has passed his class D wastewater certification. He helps with collection system cleaning and operates the utility on weekends. "Loren shows an aptitude for maintenance construction and is a quick study on process control," Green notes.

Thomas Loewenstein joined the team as an intern during the past summer.

PUTTING IT TOGETHER

That team delivers the consistent performance required by the district's setting in a tourist area (elevation 9,000 feet). The Breckenridge, Keystone and Copper Mountain ski areas are all just a short drive away.

> "When you undertake a project like that, there's always a certain segment of the community that wonders if you really know what you're doing. So I took the 10 most vocal of those folks, put them on an advisory committee, brought them down here to the plant and said, 'Look, here it is. What do you think?'"
>
> **BUTCH GREEN**

On top of that, the town is adept at promoting itself for special events. "They'll hold a barbecue challenge on a weekend and my population jumps to 18,000," Green says. "Then they'll have every Corvette in the world show up for a Corvette Weekend. On the Fourth of July, there might be 25,000 people in town for a huge display of fireworks that they shoot off just behind our treatment plant.

"The challenge is not to let those people know we're here. They don't want to stand outside and smell sewage while the fireworks go on." All of that makes work life, in Green's words, "intensely interesting."

Influent runs through a Parkson bar screen, an aerated grit chamber, and a Schloss grit-removal cyclone. From there it is pumped to the aeration basins for the activated sludge process. There are three aeration basins, all built in the old package treatment plant structure.

"We have three staged aeration basins, and that enables us to run whatever size basin we need," Green says. "Our shoulder season flows are really low (0.4 mgd), and peak flows are really high (1.0 mgd). We can add or subtract basins according to how we expect the flows to show up."

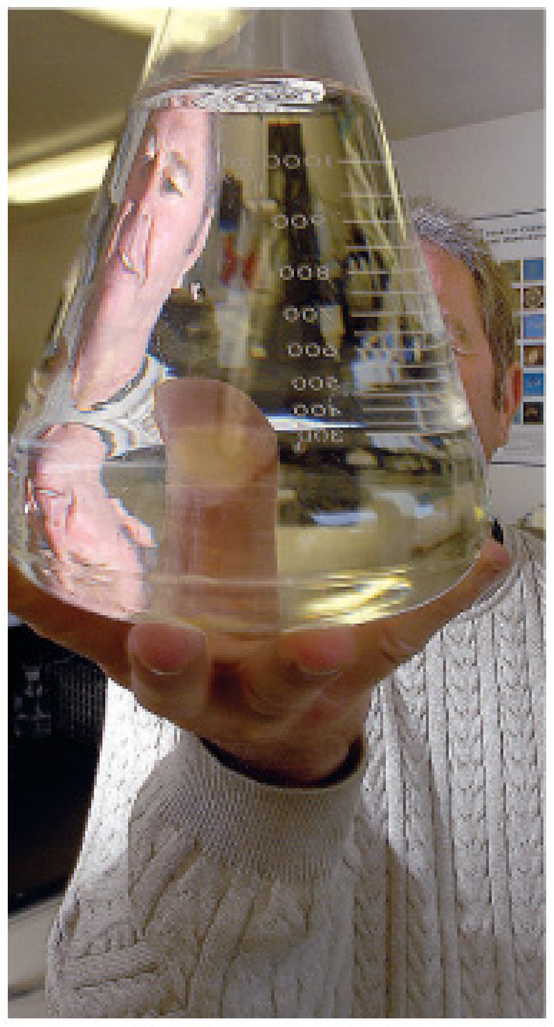
Waste activated sludge, along with solids from the clarifiers, runs through a gravity thickener and then is transferred to a 356,000-gallon aerobic digester. Westfalia centrifuges dewater the material to 15 to 20 percent solids.

A contractor trucks that finished product to a nearby molybdenum mine for composting as part of a revegetation project on a tailings site.

Clarifier effluent goes into the equalization tanks and then into the AWTs, which remove phosphorus down to 0.039 mg/l. The charcoal and sand filters provide final polishing before discharge to Dillon Lake, which is a drinking water reservoir for the City of Denver and a popular spot for boating, trout fishing and other recreation.

A LIVING SYSTEM

Green enjoys the challenge of keeping that complex system humming. "I love doing this," he says. "You have to create an environment where the microorganisms can live, and they have to be right all the time. It's really easy to kill them off, and it's not so easy to bring them back. When you work in a resort town, things change rapidly all the time. You have to stay ahead of it, not behind the curve. You need to know when the flow is coming and how much you're going to get."



Butch Green holds an effluent sample in the laboratory at the Frisco, Colo., plant.

He enjoys the people side of the business, too. "You get to meet a lot of folks," he says. "I'm around town all the time. I'm over at the post office and usually run into people there. The coffee shop across the street is a good place to meet folks. I tell them what we do and make myself available.

"I get customers who call and say, 'How come this costs so much?' The fact is, I'm running the wastewater treatment plant, and then I'm running the phosphorus control facility, which is as large as a water utility. I tell them, 'The best thing to do is just come and see us, and I'll show you what we're doing.' Usually, by the time they've wandered through the place, they have a better idea why it costs what it costs."

What Green likes most about the people side of the business is dealing with his staff and the board of directors. "I try to hire good people and get out of their way — just point in the direction we need to go and let them do their jobs.

"I always think you should hire to your weakness. If you're really good at something, hire somebody who's good at what you're not good at. That's how all of us are. We seem to complement each other. The board treats us well. It really means a lot to have a board of directors that is good about providing everything we need to do our jobs in the best way we know how."

Green never loses sight of the real reason he and his staff and the district itself exist. "Sewer lines and water lines are the veins and arteries of civilization," he says. "People get to be here because we're here. If we don't run a really good treatment plant, people can't move to town, people can't build houses, you can't have businesses. It's the things we do that make civilization work." **tpo**

more info:

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201/767-3900
www.wsus.com

Mountain Peak Controls Inc.
303/271-0376
www.mountainpeakcontrols.com

Parkson Corporation
954/974-6610
www.parkson.com

Schloss Engineered Equipment Inc.
303/695-4500

Tetra Tech Inc.
607/277-7100
www.tetratech.com

Getting Older, Getting Better

A DEDICATED STATE KEEPS THE PITTSFIELD (MASS.) WASTEWATER TREATMENT FACILITY IN FULL COMPLIANCE EVEN AS TIGHTER PERMIT LIMITS BRING NEW CHALLENGES

By Trude Witham

THE HOUSATONIC RIVER RUNS FROM THE BERKSHIRE Hills near Pittsfield, Mass., and flows south for 148 miles into Connecticut and Long Island Sound. The City of Pittsfield Wastewater Treatment Facility consistently meets stringent permit limits for discharge into the Housatonic.

"In some respects, our permit is more stringent because we contribute a large part of the river flow at its headwaters during low flow periods," says plant superintendent Tom Landry. "The headwaters of the Housatonic are in the Pittsfield area, but as the river progresses through Massachusetts and Connecticut, our contribution as a percentage of the river flow decreases."

Landry, operations foreman Joe Mack, and their staff make sure the plant protects the river, and does so efficiently. They take pride in running a safe, clean operation and a preventive maintenance program that keeps even the oldest equipment working reliably. On the horizon are a series of energy-efficiency enhancements that will reduce greenhouse gas emissions and help control costs for customers.

In January 2009, the U.S. EPA's New England office awarded the Pittsfield staff a Regional Wastewater Treatment Plant Excellence Award for operations and maintenance. It was among four plants in New England honored for exemplary performance during 2008.

In 2006, the Massachusetts Water Pollution Control Association recognized Pittsfield with a plant performance award for best large plant, after considering criteria such as performance on TSS, BOD and fecal coliform.

RECOGNIZING SUCCESS

"We're proud of this recognition, and our entire staff deserves these awards," says Landry. "This is a 24/7 operation, with some employees working at night and on holidays to keep things up and running."

The plant began operating in 1902 and has been upgraded six times. These improvements, combined with a conscientious staff, have resulted in the plant's high performance. Major equipment additions (see sidebar) have turned the plant into an advanced secondary treatment facility.

The plant is considered to have a major impact on the Housatonic River because of its 17-mgd design flow, largest on the river. The EPA calculates the effluent limits using the design flow and the 7Q10 (seven-day, 10-year low

This overview of the Pittsfield Wastewater Treatment Facility shows the aeration basins (opposite page) and two secondary clarifiers (this page). (Photography by Steve O. Nyberg)

profile

Pittsfield (Mass.) Wastewater Treatment Facility

BUILT: **1902**

LAST UPGRADE: **2008**

PLANT SUPERINTENDENT: **Tom Landry**

OPERATIONS FOREMAN: **Joe Mack**

FLOWS: **17 mgd design, 12 mgd average, 28.7 mgd peak**

TREATMENT LEVEL: **Advanced secondary**

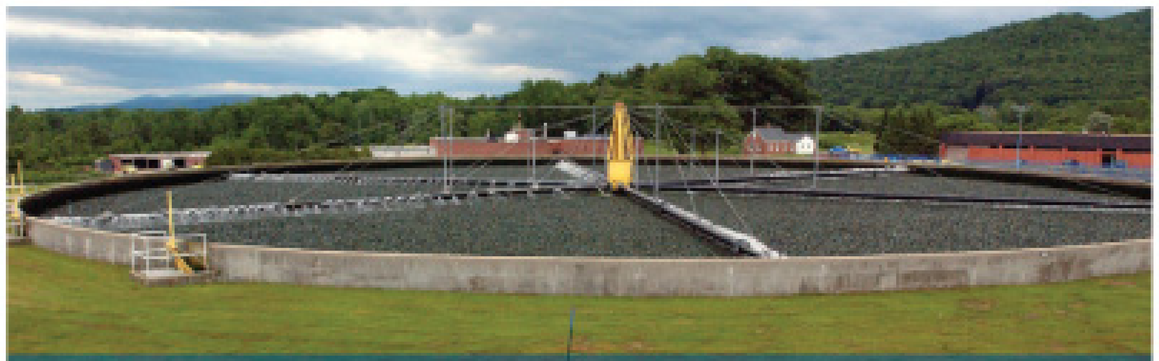
TREATMENT PROCESS: **Trickling filters, nitrification**

RECEIVING WATER: **Housatonic River**

BIOSOLIDS: **Digested, dewatered, landfilled**

Facility staff members are shown near the primary basins across from the main lab at the plant. They are, front to back, Joe Mack, operations foreman; Crystal Desnoyers, laboratory director; Kevin Hickey, laborer; Randy Hunt, dewatering; Brian Stack, maintenance foreman; and Ken Van Bramer, mechanic.

One of three trickling filters used at the Pittsfield treatment facility.



YEARS OF PROGRESS

The Pittsfield Wastewater Treatment Facility has undergone a series of major upgrades and expansions since it was commissioned in 1902. They include:

1915: Sand beds and sludge drying beds.

1937: Fixed-nozzle trickling filter, secondary clarifiers, effluent channel, administration building and laboratory.

1963: Bar screens, grit collection, primary sedimentation, skimmings collections, raw sewage pumps, two-stage anaerobic digestion.

1977: Two-stage nitrification, trickling filters and activated sludge, secondary clarifiers, intermediate settling tanks, chlorination and chlorine contact chambers, phosphorus removal.

1989: Ashbrook-Simon-Hartley dewatering belt presses and gravity belt thickeners, biosolids landfill.

2008: Pump station upgrade, four pneumatic lift stations converted to Flygt centrifugal pump stations, new Terracon dechlorination system tanks and Watson-Marlow hose pumps.

river flow). The agency is also concerned about protecting Long Island Sound.

Besides Pittsfield, the plant treats water from Dalton, Hinsdale, Lanesboro, North Lenox, Richmond and part of Peru. Once an industrial hub with a large General Electric plant, Pittsfield is now home to just a few smaller industries, including plating, metal finishing and printing. An industrial pretreatment program ensures that these industries don't create issues.

Influent passes through Rex bar screens and grit collection before primary sedimentation. Trickling filters provide secondary treatment, followed by intermediate settling tanks and nitrification aeration. Effluent from the secondary clarifiers is chlorinated before discharge to the Housatonic.

On the solids side, primary sludge and thickened waste activated sludge are sent to a primary digester, then to two-stage anaerobic digesters, and finally to the secondary digester. The biosolids are dewatered with Ashbrook Simon-Hartley belt presses and landfilled.

Above, laboratory technician Jeanne Cawley checks for methane gas with an Orsat gas analyzer. At the left, the Pittsfield facility's laboratory director, Crystal Desnoyers, prepares samples for liquid and solid separation in a centrifuge in the dewatering building.

EXPERIENCE COUNTS

The plant has performed consistently — there has been only one permit violation in the past 12 years. "Part of the reason for that is our operators have a lot of experience," says Mack. "We also have a very good preventive maintenance program, which is important because much of our equipment is older."

The plant employs 24, including 14 operators, five maintenance people, a chemist, and two laboratory technicians. Landry has been with the plant for 35 years and Mack for 40 years. The shift supervisors have 27, 25 and 20 years of experience.

With 120 acres and 11 buildings, operators do everything from equipment repair to painting and grounds work, which includes mowing 30 acres of grass.

Besides permit compliance, Mack says his biggest challenge is making sure the equipment works reliably, especially during peak flow, which may reach 25 to 30 mgd after heavy rains. When that happens, operators must monitor the main pumps.

"One pump operates automatically, but the second pump is operated manually, and we have to watch it closely to make sure the solids don't wash out," Mack says. "I also have to make sure I have enough operators to cover the shifts."

A maintenance person is always on call in case there is a storm and the plant loses power, or a clarifier goes down. Mack is also serious about safety and plant cleanliness. "We have a good safety record, which is another reason we have won awards," he says. "State and federal inspectors look at things like the chemical systems to make sure they are safe. They also consider cleanliness. Is the lab clean? Is the equipment painted? If the plant is dirty, they look more closely at everything. They don't like sloppy plants."

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JOE MACK

Operations foreman Joe Mack will retire in January after 40 years of service.

Pittsfield Wastewater Treatment Facility
REQUIREMENTS AND PERFORMANCE

	PERMIT	ACTUAL*
CBOD	10 mg/l	1.3 mg/l
TSS	20 mg/l	5.0 mg/l
DO	6.0 mg/l (April 1-Oct. 15)	10.3 mg/l
Fecal coliform	200/100 ml	8.3/100 ml
Ammonia as N	10 mg/l (April) 5 mg/l (May) 1.0 mg/l (June-Sept.)	 0.17 mg/l
Copper	16.7 µg/l	7.6 µg/l
Total P	2.0 mg/l (April) 1.0 mg/l (May-Aug.)	 0.84 mg/l
pH	6.5-8.3	7.7

* Averages for 2008

A big part of Mack's job is employee training to make sure the staff is kept up to speed. He feels that the hardest part is making employees "understand why they are doing a certain thing, not just that they're doing it."

FINDING OPERATORS

Lately, an even bigger challenge is finding licensed operators or operators with enough experience. "Getting a license doesn't make you a good operator," says Mack. "It takes at least a year to get you where you should be, and a head operator should have two to three years' experience. Ideally, I'd like to hire grade 6 or 7 operators, but I can't even find grade 4's these days."

He solves this problem by hiring people who are not yet licensed but have an interest in the job, and sending them to school. With his own retirement looming in January, Mack is concerned about who will replace him. "Licensed operators don't necessarily have an interest in being a supervisor, so I'm not sure who will do the job once I leave," he says. "I guess not a lot of people want to get into wastewater treatment."

In March 2008, lab director Joel "Flush" Gordon retired after 30 years. Gordon, winner of a 2008 New England Water Environment Association Award, was known for his writing and for his Flush Gordon's Dirty Water Web site, which offered a primer on water pollution issues.

"It's not easy to replace employees of Gordon's caliber," says Landry, who described Gordon as a "really hard-working guy, a great employee and a great friend."

IMPROVEMENTS IN STORE

Upgrades over the years have made life easier for the operating staff but have not resolved all the plant's issues. The bar racks were not upgraded as part of a headworks upgrade in 1963, and it is now difficult to find parts for some of the older equipment. The plant's oldest machinery, from the 1960s, includes an emergency generator designed to run only a portion of the plant.

Landry says the plant is due for some upgrades, including energy-efficiency improvements. He credits Bruce Collingwood, commissioner of Public Works and Utilities, with his efforts to make that happen.

"We've always been interested in saving energy, and we're working with Bruce on a waste-to-energy project that will allow us to use digester gas," Landry says. The gas will be used in a combined heat and power system that will reduce peak energy demand and curtail greenhouse gas emissions by eliminating a flare stack. SEA Consultants Inc. of Cambridge, Mass., began designing the system after a feasibility study that showed an attractive payback.

Massachusetts cities and towns spend about $150 million per year on electricity to treat 662 billion gallons of wastewater and drinking water. Energy comprises 35 to 40 percent of a treatment plant's operating budget.

The state Department of Environmental Protection launched the Energy Management Pilot for Wastewater and Drinking Water Plants, which brings together state and federal agencies and utilities to conduct facility energy audits, assess plants for renewable and clean-energy projects, and support their implementation.

"Licensed operators don't necessarily have an interest in being a supervisor, so I'm not sure who will do the job once I leave. I guess not a lot of people want to get into wastewater treatment."
JOE MACK

STIMULUS FUNDING

The Pittsfield plant was chosen for the pilot program, which provided an initial screening and ongoing tracking to compare the plant's energy performance against similar plants nationwide. As a result, the plant will receive federal stimulus money, distributed through the Clean Water State Revolving Fund (SRF), for converting the mechanical aeration system to a fine-bubble diffused-air system. Money will also be awarded for bar screen replacement and the combined heat and power system.

Even with these improvements, the plant will be challenged to meet its permit limits. A new permit issued in August 2008 reduces the phosphorus limit to 0.1 mg/l, and meeting all the requirements would cost the city an estimated $30 million. The city is appealing parts of the new permit.

In the meantime, plant personnel are continuing to do what they do best — operating a first-class plant with dedication and pride. **tpo**

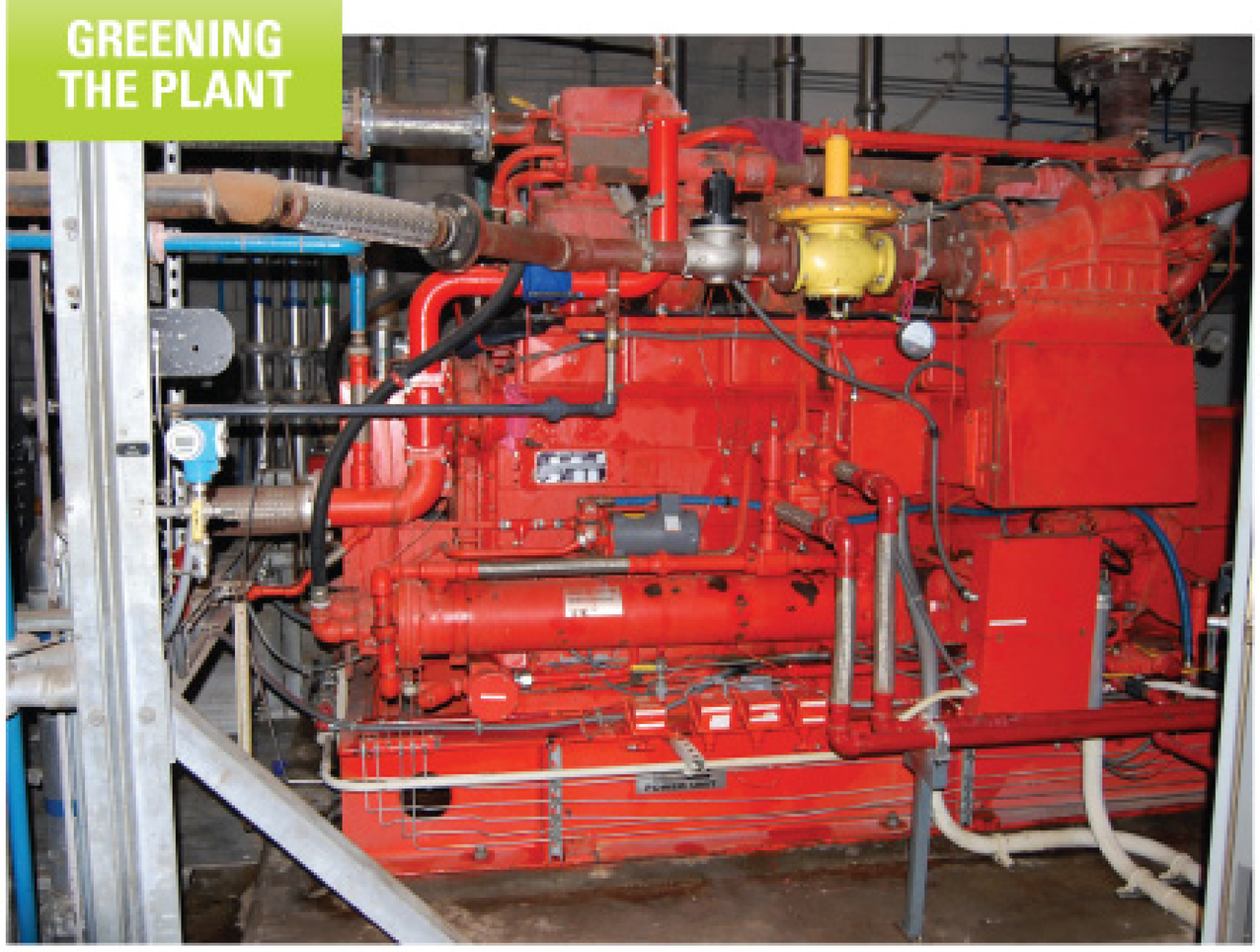
more info:

Ashbrook Simon-Hartley
800/362-9041
www.ashbrookcorp.com

ITT Water & Wastewater U.S.A. – Flygt Products
203/380-4700
www.us.ittwww.com

Terracon
800/593-7777
www.terracon.com

Watson-Marlow Inc.
800/282-8823
www.watson-marlow.com



PHOTOS COURTESY OF CITY OF ROSEVILLE

LEFT PHOTO: The 550-hp digester gas-fueled Dresser Waukesha engine at the Dry Creek Wastewater Treatment Plant in Roseville, Calif. ABOVE: The plant's five effluent channels are treated with a Trojan UV3000 Plus ultraviolet disinfection system. For each channel, there are four banks of 120 low-pressure, high-intensity lamps.

Staying True

THE CITY OF ROSEVILLE, CALIF., FOLLOWS THROUGH ON ENERGY AND ENVIRONMENTAL INITIATIVES RANGING FROM RECYCLED WATER BEST PRACTICES TO COOLER EFFLUENT FOR LOCAL SALMON RUN

By Mike Grennier

When it comes to saving energy and protecting the environment at its tertiary wastewater treatment plants, the philosophy at the City of Roseville (Calif.) can be described in a single word: diligence.

"We recognize that we work for our ratepayers who rely on us to protect their health and the environment, and do it in a cost-effective way," says Art O'Brien, wastewater utility manager. "It requires diligence and asking ourselves: Can we do that? Can we do it efficiently? Can we do it better?"

At the Dry Creek Wastewater Treatment Plant (18-mgd average dry-weather flow) and the Pleasant Grove Wastewater Treatment Plant (12 mgd), continuous improvement has led to a host of initiatives that put processed water to the best possible use, cut energy consumption, minimize chemical use, and help the salmon population.

> "We recognize that we work for our ratepayers who rely on us to protect their health and the environment, and do it in a cost-effective way. It requires diligence and asking ourselves: Can we do that? Can we do it efficiently? Can we do it better?"
>
> **ART O'BRIEN**

"Doing what we do for the environment is not just a mission statement, it's something we live on a day-to-day basis," says O'Brien.

USING RECYCLED WATER

The plants' effluent meets stringent California Water Recycling Criteria (Title 22). Recycled water from both is used to irrigate golf courses, landscapes and commercial properties.

Water from Pleasant Grove, which went on line in 2004, supplies the cooling water for the Roseville Energy Park (REP), which includes a 160-MW natural gas-fired combined-cycle power generation facility. The park, next to the Pleasant Grove plant, is operated by municipal-owned Roseville Electric. Recycled water is used as cooling tower makeup, firewater, service water and process makeup.

The REP, which can fulfill up to 40 percent of the community's electrical needs, reduces the city's dependence on the open electrical market. "The only way the REP came into play was with recycled water, because the state energy commission would not permit a power plant cooled with potable or groundwater," O'Brien says.

Recycled water is also sold for a variety of purposes, such as irrigating business parks, neighborhood parks and road medians. "It cools the REP, it saves our potable water supply, it generates revenue, and we have to treat it anyway," O'Brien says. "It's putting recycled water to its highest and best use. It's just the right thing to do."

What's Your Story?

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

REDUCING ENERGY COSTS

So is holding down energy costs. The Dry Creek plant uses a 550-hp digester gas-fueled Dresser Waukesha engine as the main power source for its aeration system. "Electricity is the second-highest cost to run our treatment plants, after staffing," O'Brien says. "Instead of using mainly electric motors, we put the engine to use, and it saves us $50,000 to $75,000 per year."

The engine runs at 100 percent capacity virtually every day to drive the blower for the fine-bubble diffuser system. The engine meets 60 to 70 percent of the blower's demand (electric motors supply the remainder).

The engine, in operation since the early 1990s, has been rebuilt twice. It still meets uptime expectations with diligent preventive maintenance. "When that engine goes down for whatever reason, it becomes our maintenance staff's No. 1 priority," O'Brien says. "Otherwise, the electric meter starts to sing."

UV DISINFECTION

Another priority at both treatment plants is meeting NPDES permit requirements and complying with the California Toxics Rule (CTR). The city recently converted the Dry Creek plant from chlorination to UV disinfection, and Pleasant Grove will also convert to UV by 2010.

"With the California Toxics Rule, chlorine disinfection byproducts need to be down in the parts per billion," O'Brien says. "The only way for us to meet that discharge criteria was to eliminate all chlorine. Treating without chlorine also has a water-quality benefit in that we've reduced the salinity of the effluent."

At Dry Creek, the plant's five effluent channels are treated with a Trojan UV3000 Plus disinfection system. Each channel, with four banks of 120 low-pressure, high-intensity lamps, can treat up to 9 mgd, for a peak disinfection capacity of 45 mgd. The system began operation in May 2009.

"We went through extensive testing to make us absolutely confident using the system before we discharged to the creek," says O'Brien. The staff opted for a UV system with automated cleaning to minimize routine maintenance.

RUNNING ODOR-FREE

The two plants also use biofilters for odor control that are virtually chemical-free. At the newer Pleasant Grove plant, biofilters are used in conjunction with preliminary treatment and solids handling. At Dry Creek, the city's original treatment plant, the biofilter used with the primary clarifiers replaces a chemical misting system.

"The system at Dry Creek was constantly going down and it took an inordinate amount of time to keep it running," says O'Brien. "And of course, we were getting odor complaints when it wasn't running."

At Dry Creek, the primary clarifiers are covered. Blowers drive odorous air into ducts and route it to the open-bed biofilters. The wood-chip media in each filter holds the microorganisms that oxidize odorous compounds to carbon dioxide, water, biomass and other benign byproducts. Rotational sprinklers maintain the proper moisture content in the media.

> "The biofilter is one of the coolest treatment processes any plant manager could find. It's a very intuitive and simple process for odor treatment. We couldn't be more pleased."
> **ART O'BRIEN**

O'Brien says the biofilters require minimal monitoring and maintenance. The only major requirement is to replace the media every four to five years. Odor complaints at Dry Creek have dropped from four per month to two per year, and only when the filter is down for maintenance. "This is one of the coolest treatment processes any plant manager could find," O'Brien says. "It's a very intuitive and simple process for odor treatment. We couldn't be more pleased."

HELPING THE SALMON

While showing care for people, the Dry Creek plant also helps salmon thrive. It's a matter of running the effluent through four large evaporative coolers (Baltimore Aircoil Company) during spring and fall before discharging to Dry Creek. The water, discharged at 60 to 62 degrees F, is essential to maintaining temperature conditions set by the state Department of Fish and Game.

The coolers are automatically controlled through the plant's SCADA system and need minimal maintenance. O'Brien says Dry Creek is one of two treatment plants in California with cooler units. "There's a lot of interest in the health of our creeks and the salmon run, and this is an efficient way for us to contribute," he says.

There's also a lot of interest in putting a fats, oils and grease (FOG) receiving station at Dry Creek to generate more digester gas and to tap for on-site power generation. The goal is to implement a FOG program as early as fall 2010.

Whether it's FOG or something else, the Dry Creek and Pleasant Grove plants are fully on board with initiatives that save energy and protect the environment. Says O'Brien, "We're staying true to what we've been called to do." **tpo**

more info:

Baltimore Aircoil Company
410/799-6200
www.baltimoreaircoil.com

Dresser Waukesha
262/547-3311
www.dresserwaukesha.com

Trojan Technologies
519/457-3400
www.trojanuv.com

A biofilter at the Dry Creek Wastewater Treatment Plant is used to control odors.

Electronic Ops

THE ORANGE COUNTY SANITATION DISTRICT DIGITIZES ITS O&M MANUALS TO IMPROVE ACCESS, ENHANCE EFFICIENCY, AND SIMPLIFY REGULAR UPDATES

By Ted J. Rulseh


David Heinz

Wastewater treatment is a complex business, especially if, like the Orange County Sanitation District, you run the third largest wastewater agency west of the Mississippi.

For more than 50 years, OCSD has treated and reclaimed wastewater generated by people living in central and northwestern Orange County, Calif. — a population that now exceeds 2.5 million. Its Fountain Valley and Huntington Beach treatment plants handle about 250 mgd.

All that takes a professional staff of more than 600, some 55 distinct processes, and a vast number of operating and maintenance procedures. To make life all the more complicated, the district is in the middle of a plant upgrade and expansion program that involves more than $2 billion in capital projects over multiple years.

That makes it a huge challenge to keep the district's vital operation and maintenance manuals up to date. To address that issue, the district has undertaken a six-year initiative to digitize the manuals and make them available to all staff members on computers throughout the facilities.

Leading that project is David Heinz, operations manager. Heinz sees digitizing as a wave of the future for treatment agencies and plants of all sizes. He spoke about the OCSD's project — called E-OMM (for Electronic Operations & Maintenance Manual) — in an interview with *TPO*.

tpo: What happened at OCSD that made the E-OMM program a priority?

Heinz: When I hired in with the district in 1979, what we had for training manuals was pretty decent. They were reasonably well organized, and the plants were simpler back then — we were a 301H waiver facility, which meant we didn't have to provide full secondary treatment.

But as our plants have grown and as we've been moving toward full secondary treatment in line with our new permits, the plants have become more complex. We've had a lot of rehab and capital improvement jobs, and along the way one piece that didn't get taken care of very well was keeping our manuals up to date. We still had them, but the information was sort of spread around, not in a centralized location where it would be easy to find. Some of the information is no longer current.

tpo: How would you describe the manuals you use today?

Heinz: Historically the district has used hard-copy O&M manuals, mainly in three-ring binders. We have two large treatment plants with multiple processes at both facilities. At each plant we have an operations center, or control center. Within those are some library shelves that house the O&M manuals. We've got probably more than 100 binders, ranging from 1/2-inch to 3- or 4-inch. Each binder focuses on a certain part of a plant.

tpo: What happened that caused the manuals to fall out of date?

Heinz: When I hired in, we had a training division in operations. They trained our staff, and they also kept up our O&M manuals. But years ago we had staffing issues and went through some downsizing, and one piece that went away was our operations training group. When that happened, attention to our O&M manuals slipped.

tpo: Why is it so important to have all these manuals and process documents?

Heinz: First of all, our NPDES permit requires that we have an O&M manual for each facility. Then, as operations manager, I know my staff needs information. They need to be able to turn to the manuals, find the descriptions of the systems and design specifications, and just have good reference documents they can access to learn the details of the facilities. The manuals are there for training and general reference, but as we look down the road, we're seeing a lot of other opportunities for using them.

"One use of our E-OMM will be for capturing information from those who retire. People like myself, who have been here for about 30 years, are going to walk away with a lot of knowledge in their heads. Updating our operations manuals is a perfect way to capture that knowledge — and a timely way."

DAVID HEINZ

tpo: Do the manuals in part provide a defense against the loss of institutional memory as experienced operators reach retirement age?

Heinz: Yes. One use of our E-OMM will be for capturing information from those who retire. People like myself, who have been here for about 30 years, are going to walk away with a lot of knowledge in their heads. Updating our operations manuals is a perfect way to capture that knowledge — and a timely way.

We are in the Baby Boom retirement phase. Over the next few years, we expect a lot of our people to be retiring. In operations alone, more than half our 92 staff members between our two facilities are eligible for retirement.

tpo: When did OCSD decide to undertake this digitizing project?

Heinz: The idea had been in the heads of many since the early 2000s. We've been talking about it since around the time of Y2K — the need to update all our operations manuals, centralize them, and get them into an electronic format. In 2006, the project actually was approved and started moving forward.

tpo: How would you describe the process of going from hard copies to an all-electronic format?

Heinz: The project has two phases. Over the past couple of years, we've been working on Phase 1. We hired a wastewater expert as a consultant to help us construct a platform on which to build the E-OMM on. Along with that, the consultant put together prototype operations manuals for four of our processes — two at each plant.

The thought was that the consultant would do the initial ones, and then we would learn from that process and use our in-house staff to do all the rest. However, we soon recognized that we didn't have the staff in operations to write all that material. It's a much bigger and more time-consuming task than we realized.

We gave it the college try, but we didn't make much progress. We didn't add any staff to support the effort, and furthermore that kind of work really takes people with technical writing ability and training.

As operators, we can write procedures for shutdowns and other basic procedures, but writing technical manuals that describe the facilities is quite a bit more difficult. Another part of Phase 1 is using the consultant to scan all our maintenance equipment manuals and put them in electronic format, too. We are now at the end of Phase 1.

tpo: What happens in Phase 2? And when will that be completed?

Heinz: If all goes well, we will be extending the contract with our consultant, who will complete the job of writing the O&M manuals. They'll be working with us to capture all the rest of the information and put it in an electronic format. It will describe all our processes — not just the four prototypes that are already done, but the 51 other processes, too. In the next couple of months, that phase will kick in.

By early 2011, we're looking to have Phase 2 done, at which time we'll have a baseline for both facilities in place. It's not going to be an effort that just ends then. It's going to be a living document. We've got construction projects that will be going on from now to eternity, so we'll be in a constant mode of updating and modifying and making sure accurate information is recorded in the E-OMM.

tpo: How will the updates be handled?

Heinz: Right now the plan is to bring on an in-house program manager who will work for operations and will be our E-OMM specialist. That person will know the ins and outs of the system and will help our staff update it, train our people to work with it, and make sure it stays current.

Printed manuals are really hard to keep up to date, especially with large facilities. If you're not all over it, if you don't have a ton of staff devoted to running around and updating the binders, it's difficult. Electronic versions are easy to touch up.

tpo: Besides construction, what kinds of things make it necessary to update the manuals on a continuous basis?

Heinz: Construction is the biggest one, but in addition, our permits change over the years. A couple years ago we were still a 301H waiver facility. Since our last permit cycle, we're in a construction phase that's going to take us to full secondary treatment. Elements of our E-OMM will have to change to meet permit conditions.

On top of that, we make changes to our processes. In our primary treatment system, for instance, we may change the polymers, we may change the dosages for ferric chloride and the chemicals we add. Sometimes we change out small systems within bigger processes. Any changes like that need to be captured in our manuals.

tpo: When it's complete, how will team members get access to the E-OMM?

Heinz: The operations staff will be able to get to the manual from their desk or from the field. They won't have to go to the control center and find the binder that has information they need. They'll be able to go to any computer and get the information quickly and easily. And it's not just for operations. The system will be open to all 644 members of our staff.

> "Printed manuals are really hard to keep up to date, especially with large facilities. If you're not all over it, if you don't have a ton of staff devoted to running around and updating the binders, it's difficult. Electronic versions are easy to touch up."
> **DAVID HEINZ**

We have computers throughout our facilities. There are two types of computer systems. There's the SCADA system, through which we run the facilities. Then we have personal desktop computers in all the process areas. In the office areas, we have a PC on most desks. We have hundreds of computers around the plants. Some operators have offices, and all operators have access to PCs. They'll be able to go into any process area, sit down at the process desk, and access the E-OMM system.

The system will be available to our maintenance staff, too, and there's a lot of utility to that because they work very closely with operations. We're looking at placing wireless laptops in our maintenance people's hands. That means they'll be able to access equipment manuals anywhere around the facility by taking a laptop with them.

They'll be able to call up manuals for the specific location they're working in, instead of trotting up to our centralized library and digging up hard-copy manuals. We've already scanned our equipment manuals. Now it's just a matter of getting the laptops to our people so they can access those manuals from the field.

tpo: What will the electronic manual actually look like?

Heinz: It's a pretty simple system. When you log in, there are multiple tabs at the top of the screen. Each tab represents a major process system. You click on whatever process area you're interested in, and then you can drill down into the various areas of interest.

For instance, we have trickling filters. If someone wants information on the trickling filters, they would click into a secondary treatment tab, in which there would be a section on activated sludge and a section on the trickling filters. Then under trickling filters there's a

multitude of areas: an introduction to the system, a safety area, a basic maintenance section, theory of operations, equipment controls, consultant operating procedures, and standard operating procedures (SOPs).

One of the most useful pieces of the manual will be the SOPs, where we capture all the procedures we use on a day-to-day basis. Right now, a lot of that is in people's heads, but it's not captured on paper and it's not captured electronically. With so many folks retiring and with new people coming in, it's really critical that we get that information captured in our manual as SOPs.

"I think for small as well as large facilities, this is a good fit and probably is the way to go. I think it's the wave of the future."

DAVID HEINZ

tpo: How will you go about capturing all that information about SOPs?

Heinz: We've put together a table of contents that's pages and pages long, listing all the different procedures where we need to put together SOPs. In Phase 2 of our process, our consultant will be tasked with taking care of the system descriptions, including the introductions, the theory of operations, the equipment controls, the safety material, and other areas.

The piece that in-house operations will focus on is putting together the SOPs. We know how to write basic procedures: This includes items such as how to start a pump, how to stop it, how to run it in a particular mode. We can do that pretty well and pretty quickly.

tpo: If everyone has access to the manuals, how do you protect against unauthorized changes? Who has the authority to make or approve changes?

Heinz: Only certain people have the rights to go in and modify the system. When changes are made, anything that is done is tracked, so that if someone goes in and tweaks a section, we can see how they tweaked it, when they tweaked it and what it looked like before they tweaked it. In the future, our program manager will authorize any changes. For now, that falls to me, and to our chief operators.

tpo: What is the response to the E-OMM sections that have been completed?

Heinz: All our staff have been trained on the basic system, and quite a few have been involved in writing up some of the system descriptions. On what we have completed so far, everybody likes it.

tpo: How practical is this for other treatment agencies? Is it feasible for smaller treatment plants?

Heinz: I think we're among the earlier facilities stepping into this. It just makes a lot of sense to capture O&M information in a small space so that everybody can access it, rather than having all your information on one shelf, where people are competing for its use, and where things fall out of date quickly.

For smaller facilities, there may be pluses and minuses. They're challenged because they probably have very limited staffs, but on the other hand they don't have such large and complex operations. I think for small as well as large facilities, this is a good fit and probably is the way to go. I think it's the wave of the future. **tpo**

Diversified Portfolio

THE NEUSE RIVER WASTEWATER TREATMENT PLANT USES VARIED METHODS OF BIOSOLIDS MANAGEMENT TO KEEP OPTIONS OPEN AND MAKE SURE THERE IS ALWAYS A RECIPIENT

By Diane Gow McDilda

THE NEUSE RIVER WASTEWATER TREATMENT PLANT in Raleigh, N.C., uses several methods to manage biosolids. The variety of land application and other alternatives keep operations interesting and employees on their toes. It also makes good business sense.

"It's like diversification in the stock market," says Tim Woody, reuse superintendent with the City of Raleigh Public Utilities. Woody knows the ins and outs from crop rotations to weather, and he ultimately decides where biosolids will go. "The main role of our Environmental Management System (EMS) is to identify markets three to six months ahead of time," he says.

In December 2006, the Neuse treatment plant became the 14th utility in the country, the first in North Carolina, and the first in the southeastern United States, to be verified by a third party and receive EMS certification for biosolids.

The EMS has given plant operations a more formal structure to diversify its biosolids program and expand its distribution network. Before EMS certification, solids were solely converted to Class B liquids and land applied. Now, the facility also produces Class A biosolids with lime stabilization and composting, adding flexibility to work around changes in the market.

FIRST STOP – CLASS B LIQUID

The Neuse plant produces about 40 dry tons per day (tpd) of aerobically digested solids, which are handled one of three ways. About 10 percent is Class B material, land applied as a liquid. About 55 percent is lime-stabilized to create Class A fertilizer. The balance (35 percent) is sent off site and mixed with bulking agents to form a Class A compost.

Regardless of the end result, all of the solids start in the same place. The plant uses the activated sludge process, and waste activated sludge is pumped through a 2-meter Ashbrook belt filter press to one of four 2.5-million-gallon Crom tanks that serve as aerobic digesters. For the Class B liquids, this is the end of the line. From the digesters, liquid 3 to 4 percent solids is hauled via tanker trucks to privately owned farmland within 60 miles of the plant and is used to fertilize corn, soybeans and alfalfa.

"In spring, we made a lot of Class B because the farmers were getting ready to plant a lot of corn and soybeans," Woody says. "We look at the markets because they're seasonal. If we've got three full tanks of Class B at 2.5 million gallons each and the farmer says, 'I'm not ready,' and we can't send it, that's costly." To store unused Class B material at the plant, the digesters must be

The Neuse River Wastewater Treatment Plant's LEED-certified training facility. (Photography by Tracey Franks Photo)

continually aerated, adding to the electric bill.

Once at the farm, the biosolids are injected into the ground or sprayed on top and disked into the soil. Most farmers use TerraGator agricultural equipment (AGCO).

Some of the 2.5 million gallons of biosolids is ready to leave the plant at a given time. The trucks hold about 6,000 gallons, and biosolids can be applied at 18,000 gallons per acre, or about three truckloads per acre. This means around 400 truckloads make the trip between treatment plant and farm land and close to 140 acres are receiving the biosolids.

"I have to be aware and know the different processes," says Woody. "We hauled 2 million gallons of stored liquid biosolids last week. We couldn't process it that quickly, because we couldn't get it through the gravity belt press. It's my responsibility to balance what we make."

For example, once farmers finish planting corn and soybeans, distributing liquid product is difficult. Woody needs to understand the agricultural base. The plant deals with 300 to 400 farmers in a given year.

Laboratory tests are done on samples from each batch out of the digesters for regulatory compliance and to help farmers apply the material at agronomic levels. When the batch is released, so are the results. "We want 100 percent confidence," says Woody. "We are completely transparent. If you hold anything back, it can take years to win back the farmers' trust."

HAVING YOUR CAKE

The portion of the biosolids not directed to land application is converted to biosolids cake. From the digester, the material is pumped to sludge holding tanks. It is then dewatered using three 2-meter Ashbrook belt presses operated in parallel, yielding material at about 22 percent solids.

A relatively small portion of that material is transported off site to make compost. For this stream, solids from the belt press go to one of two storage

NEUSE RIVER WASTEWATER TREATMENT PLANT PERMIT REQUIREMENTS	
BOD_5 (summer)	5.0 mg/l monthly avg. 7.5 mg/l weekly avg.
BOD_5 (winter)	10.0 mg/l monthly avg. 15.0 mg/l weekly avg.
TSS	30 mg/l monthly avg. 45 mg/l weekly avg.
NH_3-N (summer)	2.0 mg/l monthly avg. 6.0 mg/l weekly avg.
NH_3-N (winter)	4.0 mg/l monthly avg. 12.0 mg/l weekly avg.
Fecal coliform	200/100 ml monthly avg. 400/100 ml weekly avg.
TN $Load_{Total}$	676,417 lb/year
Total Phosphorus	2.0 mg/l quarterly avg.

Tim Woody, reuse superintendent with the City of Raleigh Public Utilities.

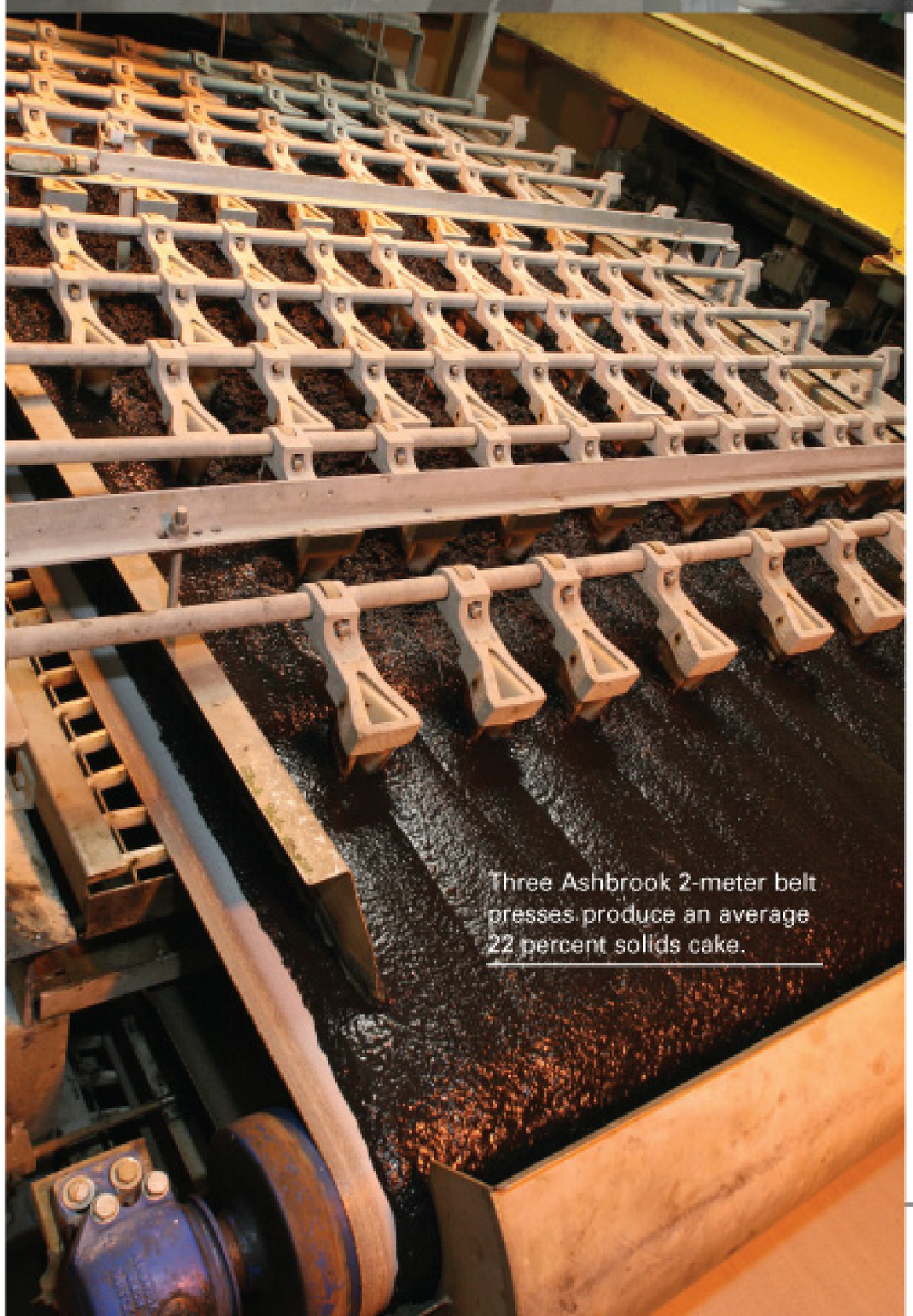
"It's like diversification in the stock market. The main role of our Environmental Management System program is to identify markets three to six months ahead of time."
TIM WOODY

profile

Neuse River Wastewater Treatment Plant, Raleigh, N.C.

BUILT:	1976
TREATMENT LEVEL:	Tertiary
TREATMENT PROCESS:	Activated sludge
FLOWS:	Design 60.0 mgd, average 36.7 mgd
RECEIVING WATER:	Neuse River
BIOSOLIDS PROCESSES:	Aerobic digestion, lime stabilization, off-site composting
BIOSOLIDS VOLUME:	40 dry tons/day
BIOSOLIDS USE:	Land application; fertilizer and compost production
WEB SITE:	www.raleigh-nc.org

Reuse superintendent Tim Woody shows the plant's new Cemen Tech mixer, which mixes lime kiln dust and dewatered primary sludge to produce a Class A biosolids for distribution, mainly to local agricultural sites.



Three Ashbrook 2-meter belt presses produce an average 22 percent solids cake.

bins (hoppers), each with a capacity of 100 wet tons. The solids are then dropped into trucks parked below, transported to a composting company, and mixed with wood chips. The process converts the Class B material to Class A compost, which is distributed in bulk to local markets.

The majority of solids are kept on site to be converted to Class A material through lime stabilization. These solids are transferred via belt conveyor to a cement mixer. "We used to use fly ash and hydrated lime," says Woody. "But the arsenic quality was an issue, as well as reliability. A consistent product is more achievable with only one admixture, rather than two." Two admixtures also double the chances of delivering and scheduling errors.

Now the plant mixes dewatered biosolids and lime kiln dust using a Cemen Tech mixer. The final product is Raleigh-Plus fertilizer, sold and distributed to farmers. "We will deliver and provide the farmer a pull-behind spreader as part of our lease program for $3 a ton," Woody says. "Costs may be reduced if the farmer transports the material himself or does not need to lease one of our spreaders."

When the fly ash and hydrated lime were eliminated, so was the previous mixer, which had been in service for 25 years. "The Cemen Tech mixer does such a good job," Woody says. "We maintain a temperature of 70 degrees C for 30 minutes. Before, we had to overdose to keep the temperature up. It's been running for about one year, and it mixes so well we've been able to cut back on the lime kiln dust."

When changes were being made to the plant to bring on the new mixers, options for managing biosolids were temporarily limited. "When we put the mixer on line, we had to shut down the Class A operation," Woody says. "The entire daily production went to the storage hoppers. The composter was only contracted to receive 100 tpd. We landfilled the excess tonnage to avoid exceeding the contract amount."

SMOOTH OPERATORS

The Neuse River facility typically makes about 120 product tons in an eight-hour shift. "The shift starts making Class A product," Woody says. "The

The Neuse River Wastewater Treatment Plant.

ROOM FOR IMPROVEMENT

NEUSE RIVER WWTP

As successful as the Neuse River treatment plant has been in producing Class A biosolids, there are many changes underway to increase capacity, improve biosolids production, and take advantage of alternative energy.

The aerobic digesters are scheduled to be replaced with three 3.25-million-gallon egg-shaped anaerobic digesters. Also included in the expansion is replacement of the existing belt presses with three 3,000-pound-per-hour centrifuges, with polymer addition, an additional storage silo, a methane storage unit, and a product dryer.

next eight hours will be spent filling up the hoppers for the composter. We do it on a shift basis because it keeps the quality consistent."

Even though it's Woody's responsibility to read the market and understand the agricultural demands, he acknowledges the other employees involved in producing consistently high-quality fertilizer. It starts upstream in the treatment plant where responsibility rests with T.J. Lynch (Grade IV operator), superintendent of plant operations. Others include Jesse Luper, assistant reuse superintendent; Winslow Davis (Grade IV), operations supervisor; and Jason Waters, land management supervisor.

"We have a great staff," says Woody. Beyond working in the plant, one employee spends the vast majority of time in the field with the farmers. "Don Edwards is our residuals distribution coordinator," says Woody. "He is a certified land application operator and is very well-versed in nutrient management and agricultural practices."

It's important to connect with the farmers, not just to schedule deliveries, but to verify the quality and consistency of the product. "The farmers all know each other, and they know who gets what." Woody says. "If they see something on someone else's land and it's black and theirs is gray, there's a problem."

BEYOND THE GATES

For the Class B liquids, the utility samples the biosolids to stay in compliance with the state-issued permit. With the Class A biosolids, the farmers sign on as a receiver stating that they will properly manage the material.

"They say they won't eat it or drink it," Woody jokes. "But we are selective. Back to the EMS program, we have the responsibility beyond the confines of our gate. Fifty miles away, it's still our responsibility. If a farmer dumps it in a creek, we'll have to deal with it one way or another. We might as well deal with it upfront."

> "We want 100 percent confidence. We are completely transparent. If you hold anything back, it can take years to win back the farmers' trust."
> **TIM WOODY**

Even with the complexities of various routes and processes, Woody is proud that the facility manages its own biosolids. "Some plants simply contract out biosolids — they don't have to keep up with these details," Woody says. "Especially with land-based disposal, you need a strong biology and agriculture background and an understanding of economics. If it's land-based disposal, you need to know the processes, engineering and management."

Woody manages to stay abreast of current operations with an eye on the future. He's considering other projects for the plant, including using biosolids to fertilize biofuel crops. That's just one more way to keep employees on their toes and make good business sense. tpo

more info:

AGCO Corp.
888/989-8525
www.agcocorp.com

Ashbrook Simon-Hartley
800/362-9041
www.ashbrookcorp.com

Cemen Tech Inc.
800/247-2467
www.cementech.com

The Crom Corporation
352/372-3436
www.cromcorp.com

The Environmental Management System (EMS) Team includes (from left), T.J. Lynch, Darrell Crews, Marti Gibson, Jason Waters, Marla Dalton, Burrell Brock, Winslow Davis, Tim Woody, Don Edwards and Jesse Luper.

More Control, Less Energy

AN ILLINOIS WASTEWATER TREATMENT PLANT USES A BLOWER CONTROL SYSTEM TO END CONCERNS ABOUT EFFLUENT DO AND AMMONIA LEVELS WHILE SAVING ON ELECTRICITY

By Scottie Dayton

PHOTOS COURTESY OF JOSEPH SANCHEZ, METROPOLITAN INDUSTRIES INC.

Class 4 operator Joe Cortese inspects an Andritz centrifuge at Lockport's newest wastewater treatment plant.

Hydraulic overloading and the need to meet dissolved oxygen (DO) requirements were constant concerns at the Lockport (Ill.) Wastewater Treatment Plant. Its ammonia nitrogen limit was 15 mg/l discharging into Deep Run Creek, and superintendent Joe Findlay had trouble keeping it below double digits. The DO hovered just above the permitted 6.0 mg/l.

Enlarged three times since it opened in 1959, the facility consists of the original north plant and the south plant built in 2005. The latter had room for one final expansion, and the design work went to Robinson Engineering Ltd., South Holland, Ill. They selected a three-pass, plug flow, conventional aeration system that included a sludge-handling building with centrifuge and gravity belt thickener, sludge storage tank, and an aerobic digester. Four aeration basins were added to the existing two.

More equipment, however, meant higher electric bills. The Robinson team knew that blower motors were responsible for 50 to 80 percent of the energy required in the diffused aeration activated sludge processes. They turned to engineers at Metropolitan Industries Inc., a designer of custom pumping controls and equipment in Romeoville, Ill., to look for solutions.

Share Your Idea

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

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

Their answer incorporated DO sensors, modulating valves, multiple proportional-integral-derivative (PID) control loops, and variable-frequency drives (VFD) to control pressure in the air header and modulate airflow to each aeration zone. They also retrofitted the two aeration basins in the north plant. The combination reduced Lockport's overall energy usage 60 percent and eased concerns about permit levels.

SOUTH MEETS NORTH

Four upgrades between 1971 and 2007 increased the design capacity of the Lockport plant from 250,000 gpd to 5 mgd. Anaerobic digestion was added in 1986. Lockport has six lift stations, 100 miles of sewer mains, and an average daily flow in excess of 3.5 million gallons. It serves 9,410 residential and 328 commercial/industrial accounts.

The north plant wasted the retained mixed liquor once a week from its two aeration chambers, both 40- by 80- by 18-feet-deep. The new basins, 43- by 100- by 21-feet-deep, retain mixed liquor for about 14 hours. Fine-bubble aeration provides the necessary oxygen transfer efficiencies, enabling the south plant to waste daily or every other day. "Best of all," says Findlay, "the DO levels are consistently at 7 or 8 mg/l in the receiving stream. And our ammonia hasn't risen above 1 mg/l."

The north and south plants each have a sludge centrifuge stored in a 70-foot-diameter, 41-foot-tall tank. The old centrifuge processes 50 gpm, and the new one 200 gpm. Continental Farms in Peotone, Ill., land applies the dewatered biosolids, but Lockport can haul liquid material if needed.

Michael Anderson performs routine maintenance in the blower pump and control room. The variable-speed control system precisely controls oxygen levels by adjusting blower speed to optimal levels.

"Holding the sludge longer and increasing digestion with the aerobic digester have produced fewer biosolids and cut our hauling expenses," says Findlay. "Before the upgrade, Continental was moving 42 cubic yards a week. It's down to 28 cubic yards a week now."

The system also reduced maintenance work. "My guys used to run around manually throttling the inlet valve on each blower and taking DO readings by hand," says Findlay. "It's done automatically now, freeing them to do more sludge handling or other maintenance projects, and the SCADA control system has made it easier for me to operate the plant."

Lockport's Kevin McCaffery checks dissolved oxygen readings.

PROCESS CONTROL

Automation began with programming of the remote terminal unit (RTU) to hold adjustable DO set points in treatment zones by using PID loop controllers. DO sensors in strategic locations transmit signals to the SCADA-RTU, which compensates for BOD, ambient air density, temperature and process demand to minimize power input to the blower motors. The PIDs also prevent blower surging and adjust the speed to changing organic loads.

"The VFD blowers are far more energy-efficient because we don't run the motors as fast or as hard," says Findlay. "That increases their lifespan, reduces maintenance, and minimizes parts replacements."

To balance the air flow between each basin and treatment zone, the zone header pipe in the blower room has a motor-operated valve that modulates automatically. The programmable logic controller (PLC) uses information from an airflow meter, air pressure transducer in the header pipe, and DO readings in strategic zones to monitor and adjust blower speed and valve positions continuously.

"I can set the DO levels on each zone air-supply pipe and select which DO sensor controls a zone on the SCADA-RTU screen," says Findlay. "Zones not furnished with DO sensors follow the air supply of a similar zone. The system allows me to see what is happening in real time from my desktop."

CONCERNS PUT TO REST

By controlling the number of operating blowers and their speeds, Findlay can regulate how much air pressure is delivered to the zone air valves. The zone having the greatest air demand determines the pressure set point. Findlay maintains DO at 2 mg/l. "Concentrations above 4 mg/l don't improve the system's operation, but they do increase aeration costs," he says.

The south plant now has three 100-hp inverter duty-rated motors. The north plant has three 300-hp units. All blowers are by Hoffman — a division of Gardner Denver. They are shut down monthly to grease the bearings. "We're halfway through switching all of them to sealed bearings," says Findlay. "Once we do that, we'll change them out every five years."

A new precast influent building at the headworks houses the level controls and the new ABB Series 550 VFD for the six 40-hp influent pumps. Lockport's final expansion laid Findlay's anxieties over permit levels to rest, while improving the plant's energy use and operating costs significantly. **tpo**

more info:

ABB
800/215-3006
www.abb.com

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

Gardner Denver Inc.
217/222-5400
www.gardnerdenver.com

Metropolitan Industries, Inc.
800/323-1665
www.metropolitanind.com

"I can set the DO levels on each zone air-supply pipe and select which DO sensor controls a zone on the SCADA-RTU screen. Zones not furnished with DO sensors follow the air supply of a similar zone. The system allows me to see what is happening in real time from my desktop."

JOE FINDLAY

product focus

Reaching New Levels

MANUFACTURERS CONTINUE A PARADE OF INNOVATIONS IN DIGITAL TECHNOLOGY THAT IMPROVES EFFICIENCY, QUALITY AND PERFORMANCE IN TREATMENT OPERATIONS

By Benjamin Wideman

Digital control has brought major advances in wastewater treatment operator productivity and plant efficiency and performance. Control systems enhance measurement precision and reliably keep critical processes within tolerances even when unattended. Here are some recent innovations in digital technology for wastewater treatment operations.

SEL-2411 from Schweitzer Engineering Laboratories Inc.

PROGRAMMABLE CONTROLLER

The SEL-2411 programmable automation controller from Schweitzer Engineering Laboratories Inc. is designed for mission-critical applications in harsh water and wastewater applications. Digital and analog I/O options and various communications protocols provide flexibility.

Users can customize the SEL-2411 with enclosures, preprogramming and numerous other options to meet specific applications. In addition to UL and Class I, Division 2 ratings, the SEL-2411 operates in a temperature range of -40 to +85 degrees C and withstands electrostatic shock up to 15 kV and vibration/shock up to 15 g.

The free, downloadable programming software enables users to program logic equations with a drag-and-drop expression builder or a text editor. The device replaces PLCs and RTUs in vital processes such as wells, lift stations, blowers, booster pumps and scum pits. Built-in voltage and current connections allow operators to monitor electrical quality and power consumption, and can be accessed by operators via the front-panel display or through a SCADA system. Other inputs can be used to monitor flow, intrusion, motor temperature or other process variables. **509/332-1890; www.selinc.com.**

LEVEL DETECTOR

The Opti-Float level detector by Cox Research is mercury- and lead-free and looks and operates like a conventional float switch except that it uses plastic fiber-optic cable instead of electric wires. The detector can be used to replace mercury floats, which are being banned by state legislation.

The floats can be used directly in hazardous areas and have been tested at more than one million operations, 10 to 20 times that of electrical float switches. Through plastic fiber-optic cable, it transmits a beam of light from an LED in a remote transceiver down to the float, where the beam makes and breaks depending on the tilt of the float. When the transceiver detects the presence or absence of light, it activates a relay in the transceiver, which can then operate other devices. Kits are available for retrofitting of existing control panels. **800/910-9109; www.coxresearch.com.**

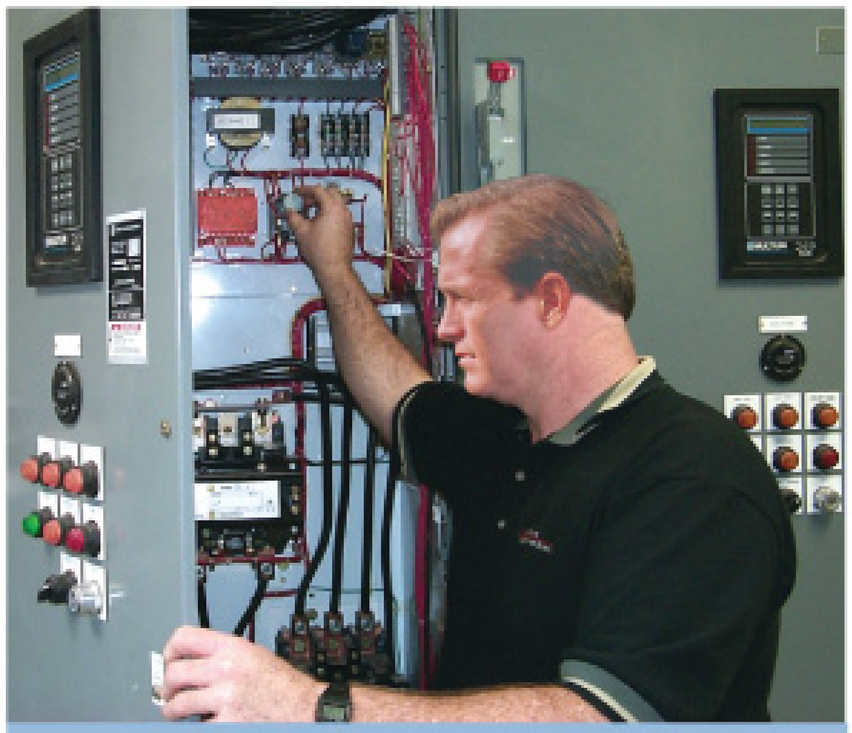
Opti-Float by Cox Research

HAND-HELD DATA COLLECTION

LabLite LLC offers a hand-held data collection module used to record data in the field or around the treatment plant. The data is then uploaded to laboratory or plant software. The program requires a Pocket PC or handheld running Windows Mobile 2003 SE operating system or higher, Microsoft ActiveSync, a sync cable or cradle, and a PC with access to the SQL Server hosting the LabLite database.

Data collection module from LabLite LLC

I-Link LSN 200 by SJR-Rhombus



Service program from Revere Control Systems

New software features from MJK North America Inc.

Collection data used to populate the dropdown boxes are stored within the lab or plant software and downloaded to the handheld upon initialization. When a name is selected from the Users dropdown, the Site dropdown is populated. Sites assigned to the selected user appear at the top of the list, preceded by asterisks, followed by the remaining sites.

Matrix and Test dropdowns are populated in a similar manner. Once dropdown selections are made, Result and Bottle Number information can be entered. When the device is returned to its cradle, or connected via the synchronization cable, data can be uploaded to the database, and removed from the grid. **888/954-5483; www.lablite.com.**

CONTROL EQUIPMENT SERVICE

Revere Control Systems' aftermarket service program for digital control system equipment covers PLC software and hardware upgrades; programming for PLCs, HMI, DCS and SCADA; computer hardware and software upgrades; network security; site control systems inspection; loop tuning; circuit board exchange; calibration; wireless and fiber-optic work; and custom report generation. Multiple service plans are available to fit different needs and budgets. Custom plans can be developed. **800/536-2525; www.reverecontrol.com.**

REMOTE MONITORING

The I-Link Lift Station Notifier (I-Link LSN 200) remote monitoring system by SJR-Rhombus is designed for monitoring pump lift stations and other pump applications. The next-generation system uses a Web-based gateway to collect and report system status and alarm events to a database application via a cellular phone modem.

The device can be installed in new control panels or retrofitted to existing systems. Two-way communication lets users monitor system performance and program system parameters from a PC. Reporting capabilities provide instant results — the system notifies users of a system event as it occurs, detailing complete event specifications.

Normal operating conditions are reported daily. Features include power fail detection, service button interface, high- and low-level alarm, and digital relay output. The device includes access to a secure, custom Web site to allow monitoring and administration of the unit and its data. The user-friendly Web page database displays time-stamped alarm events, mapping of locations, configurable alarm-handling options, historical data, and custom reporting. **218/847-1317; www.sjerhombus.com.**

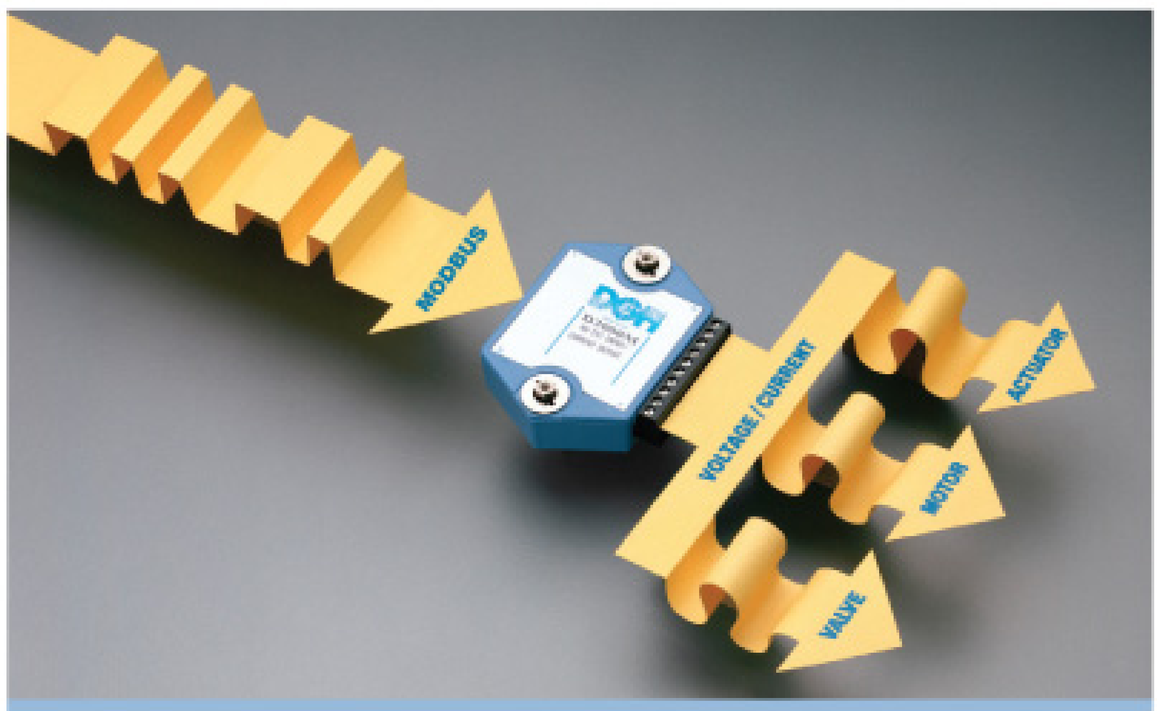
ULTRASONIC LEVEL TRANSMITTER

MJK North America Inc. offers new software features for its digital ultrasonic Shuttle level transmitter. Software allows operators to switch to and use new sensor frequencies and types to optimize selections for their application needs. The software also has a higher-resolution false echo detection and screening of up to 22 separate echoes.

New signal management features include amplification filters and new solids level application setups. Advanced signal controls allow measurements from 0 to 4 inches through up to 75 feet with one sensor, while being less affected by foam, surface debris or out-of-range signals (spiking). It has simple alarm control, level control or alternating pump control with its two relays. The mA transmitter output is fully scalable. The device also operates either as a three-wire, loop-powered device or as a 115VAC powered device for installation flexibility. **877/655-5465; www.mjk.com.**

MODBUS-COMPATIBLE MODULES

DGH Corp. offers the D3000M series of Modbus-compatible smart digital-to-analog modules that make it easy to control an analog output using a serial port. The modules combine a 12-bit DAC (digital-to-analog converter) with programmable analog-output control features and communicate using



D3000M series from DGH Corp.

Modbus RTU over an RS-232C or RS-485 link. The series has 16 models: voltage (0-1V, +/- 1V, 0-5V, +/-5V, 0-10V, +/- 10Vdc), current (0-20mA, 4-20mA), with either RS-232 or RS-485 input.

Output slopes are fully programmable from 0.01V/s (mA/s) to 10,000V/s (mA/s). Input-to-output isolation is 500Vrms. Output burnout protection is 240VAC (current outputs), +/-30V (voltage models). The modules are packaged in a unique 3.60- by 2.45- by 0.85-inch ABS case with captive hardware and a plug-in screw terminal connector. **603/622-0452; www.dghcorp.com. tpo**

Pumping Productivity

INEFFICIENT PUMPING SYSTEMS CAN BE LARGE ENERGY WASTERS. EFFECTIVE MAINTENANCE AND THOROUGH SYSTEM ASSESSMENTS CAN KEEP PUMPS PERFORMING AT THEIR BEST.

In the United States, pumps used for a multitude of purposes consume some 142 billion kWh annually. At a cost of five cents per kWh, this translates to more than $7.1 billion per year in operation costs.

A single continuously operated centrifugal pump driven by a fully loaded 100-hp motor will use 726,000 kWh and cost about $36,000 per year. A 10 percent reduction in operating costs can produce $3,600 in savings annually.

For wastewater treatment professionals, the lesson is that effective maintenance practices and a survey of existing pumping systems are essential for keeping treatment plant pumps operating well. These measures help in detecting problems, scheduling repairs, and avoiding early failures.

Regular maintenance also reveals deteriorations in efficiency and capacity, which can occur long before a pump fails. For example, wear ring and rotor erosions can be costly problems that reduce wire-to-water efficiency by 10 percent or more. Beyond energy savings, downtime can prove extremely costly when it affects critical processes.

PREVENTIVE ACTIONS

Preventive maintenance includes coupling alignment, lubrication and seal maintenance and replacement. Mechanical seals must be inspected periodically to ensure that there is no leakage, or that leakage is within specifications. Mechanical seals that leak excessively usually must be replaced.

A certain amount of leakage is required to lubricate and cool the packing seals, but the packing gland needs to be adjusted if the leakage exceeds the manufacturer's specifications. The packing gland must be replaced if it has to be tightened excessively to control leakage. Overtightening causes unnecessary wear on the shaft or its wear sleeve and increases electric power use. Routine maintenance of pump motors, such as proper lubrication and cleaning, is also vital.

PREDICTIVE ACTIONS

In addition to planned maintenance, predictive maintenance helps minimize unplanned equipment outages. Sometimes called condition assessment or condition monitoring, this practice has become easier with modern testing methods and equipment. Methods that apply specifically to pumping systems include:

Vibration analysis. Trending of vibration amplitude and frequency can detect an impending bearing failure and reveal voltage and mechanical imbalances that could be caused by impeller erosion or coupling problems. Changes in vibration over time are more meaningful than a single snapshot of the vibration spectrum.

Motor current signature analysis. Sometimes called dynamic analysis, this technique reveals deteriorating insulation, rotor bar damage, electrical system unbalance, and harmonics. It can also pick up system problems such as malfunctioning control valves that cause flow rate disturbances. Again, tracking of the signature over time is more valuable than a single measurement.

Lubrication oil analysis. This technique applies only to large, oil-lubricated pumps and is an expensive procedure. Oil analysis can detect bearing problems caused by metal particles or chemical changes that result from overheating, and seal problems caused by pumped fluid in the oil. It also gives guidance on proper oil-change intervals.

Periodic efficiency testing. Many progressive operators test wire-to-water efficiency and keep records to spot trends.

SURVEYING PUMPING SYSTEMS

Pump system surveys should begin with the gathering of a broad range of information, including details from the drive motor nameplate, operating schedules, and head/capacity curve specifications (if available) that highlight design and operating points. A survey also should assess the system's flow rate and pressure requirements, pump style, operating speed and number of stages.

Since most pump systems last more than 15 years, excessive costs related to inefficiencies can accumulate if left unchecked. Optimum design and operation efficiency are in the best interests of treatment facilities, which rely heavily on pumping systems for the operation of critical processes.

A thorough survey also should check suction and discharge pressures and look for conditions commonly associated with inefficient pump operation. These include:

- High maintenance requirements
- Oversized pumps that operate in a throttled condition
- Throttled control valves that provide fixed or variable flow rates
- Cavitating, badly worn, noisy, clogged or misapplied pumps
- Pumping systems with large flow rates, pressure variations or bypass flow
- Impeller and casing wear, which increase clearances between fixed and moving parts
- Excessive wear on wear rings and bearings
- Improper packing adjustment that causes binding on the pump shaft
- Multiple pump systems where excess capacity is bypassed or excess pressure is provided.

In addition, engineers and other maintenance personnel need to review changes in the pump system that vary greatly from initial design conditions. Alterations to distribution system cross-connections, parallel mainlines, pipe diameter and pipe material can negatively affect the original system curve.

After a careful review of all these characteristics, professionals can better identify the sources of pumping system inefficiency and take a variety of energy- and cost-saving measures. These can include shutting down unnecessary pumps and re-optimizing pumping systems by using pressure switches to control the number of pumps in service when flow rate requirements vary.

Another technique entails reducing system operating pressures using a booster or dedicated pump when an entire pumping system may be operating at high pressure to meet the requirements of a single end use.

LOOKING DEEPER

Other efficiency procedures for consideration are the restoration of internal clearances, replacement of standard efficiency pump drive motors with NEMA Premium motors, switching oversized pumps with properly sized units, and trimming or changing pump impellers to ensure that outputs match system requirements.

Since most pump systems last more than 15 years, excessive costs related to inefficiencies can accumulate if left unchecked. Optimum design and operation efficiency are in the best interests of treatment facilities, which rely heavily on pumping systems for the operation of critical processes.

Treatment operators have access to excellent sources of information about pumping systems and their proper care. These include:

The Hydraulic Institute (HI). The HI is the largest association of pump producers and suppliers to the pump industry in North America and is a global authority on pumps and pumping systems. Its mission is to serve as a forum for the exchange of industry information, while providing value-added services to member companies and pump users worldwide. Visit www.pumps.org.

Pump Systems Matter (PSM). This initiative was created by the HI to help North American pump users gain a competitive business advantage through strategic, broad-based energy management and pump system performance optimization. The mission is to provide tools and collaborative opportunities to integrate pump system performance optimization and efficient energy management practices into normal business operations. Visit www.pumpsystemsmatter.org.

U.S. Department of Energy (DOE). The department's Industrial Technologies Program (ITP), through partnerships with industry, government and nongovernmental organizations, develops and delivers advanced energy efficiency, renewable energy, and pollution prevention technologies for industrial applications. Best Practices is a part of ITP and offers resources on ways to reduce energy and maintenance costs. These include training workshops, software tools, sourcebooks, case studies and tip sheets. A Pumping System Assessment Tool aids in assessment of pumping system efficiency and in estimating energy and cost savings. Visit www.eere.energy.gov/industry.

Other helpful references include:

- ANSI/HI Pump Standards, Hydraulic Institute, 1997-2005.
- *Pump Life Cycle Costs: A Guide to LCC Analysis of Pumping Systems,* Hydraulic Institute & Europump, 2001.
- *Extend Your Motor's Operating Life,* HI/PSM/DOE Tip Sheet, 2006.
- *Test for Pumping System Efficiency,* HI/PSM/DOE Tip Sheet, 2006.

This article is adapted from Improving Pumping System Performance: A Sourcebook for Industry, *developed jointly by the U.S Department of Energy and the Hydraulic Institute (HI).* tpo

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people/awards

Dave McKinstry, Colfax Corp. vice president of business development and special projects, received the Hydraulic Institute's Lifetime Achievement Award.

Frank D'Ambrosia, superintendent of the Archbold, Ohio, wastewater treatment plant, received the Ohio Water Environment Association's F.D. "Dean" Steward Award.

Fiesta Village Advanced Wastewater Treatment Plant, Lee County, Fla., received the Florida Water Environment Association's Earle B. Phelps Award in the advanced wastewater treatment plant category.

Alan S. Salmon received the Collection System Operator Award from the New York Water Environment Association.

Pacific Environmental Resources Corp. and **Alinda Capital Partners LLC** were presented the Global Water Awards 2009 Water Deal of the Year Award of Distinction for their contribution to the advancement of public-private partnerships in the international water sector, specific to their contract with the Santa Paula (Calif.) Wastewater Facility.

The West Side Wastewater Treatment Facility (Fayetteville) engineering design received the highest possible engineering award in Arkansas at the 2009 American Council of Engineering Companies Arkansas Chapter Engineering Excellence award ceremony.

The Arkansas Water Works & Water Environment Association announced the following awards: **Wayne Robbins,** city of Fayetteville, Water Works Outstanding Achievement, population greater than 5,000; **David Rawls,** Center Grove Water Users Association, Water Works Outstanding Achievement, population less than 5,000; **Jack Hutcheson,** city of Bentonville, Wastewater Outstanding Achievement, population greater than 5,000; **Diana Woodle,** city of Higginson, Wastewater Outstanding Achievement, population less than 5,000; **City of Bodcaw, Southwest District,** Water – Special System Recognition; **Piggot Water/Wastewater-Northeast District,** Water – Special System Recognition; **Center Grove Water Users Association-Central District,** Water – Special System Recognition; **Greenbrier Wastewater-Central District,** Wastewater – Special System Recognition.

Nilaksh Kothari, general manager of Manitowoc (Wis.) Public Utilities was appointed to the Board of the Water Research Foundation.

The Illinois Water Environment Association announced the following award winners: **Greg Garbs,** WEF Hatfield Award; **John Lamb,** WEF Bedell Award; **Chuck Corley,** WEF Delegate Service Award and IWEA Paul Clinebell Award; **Sandra Conrad,** WEF Laboratory Excellence Award; **Lakhwinder Hundal,** IWEA Best Technical Presentation Award; **Mark Termini,** IWEA Meredith Award; Kendra Sveum, IWEA Young Professional Award; **Steve Graceffa,** IWEA Membership Recruitment Award; **Mary Johnson,** IWEA Presidential Service Award; **Daris Williams,** Sylvanus Jackson Scholarship Award.

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

education

Atlantic Canada Water Works Association

The ACWWA has these workshops and seminars:

- Sept. 8-11 – Water Treatment, Halifax, Nova Scotia
- Sept. 16 – Water and Wastewater Operator Exam, Truro, Nova Scotia
- Sept. 16 – Problem Solving Techniques Using the Activated Sludge Process, Fredericton, New Brunswick
- Sept. 17 – Problem Solving Techniques Using the Activated Sludge Process, Halifax, Nova Scotia
- Oct. 6-9 – Wastewater Treatment, Fredericton, New Brunswick
- Oct. 14 – Water and Wastewater Operator Exam, Sydney, Nova Scotia.

Visit www.acwwa.ca

California Water Environment Association

The CWEA has a Safetyfest in Woodland on Oct. 28. Call 650/832-6251 or visit www.cwea.org.

Indiana Water Environment Association

The IWEA is offering these workshops/exams:

- Sept. 9 – IWEA Operations and Maintenance Committee Fall Seminar, location TBA
- Oct. 27 – IWEA Collections Systems Certification Exam, Indianapolis
- Oct. 29 – IWEA Collections Systems Certification Exam, Fort Wayne.

Call 317/328-2151 or visit www.indianawea.org.

Kansas

The Kansas Water Environment Association has these workshops:

- Sept. 5 – Small Systems Wastewater, Medicine Lodge
- Sept. 10 – Small Systems Wastewater, Newton
- Sept. 10-11 – Wastewater Treatment, Independence
- Sept. 17-18 – Wastewater Collections, Fort Scott
- Oct. 1 – Basic Wastewater, Mulvane
- Oct. 1-2 – Wastewater Treatment, Pittsburg
- Oct. 2-3 – Natural Systems for Wastewater Treatment, Dodge City
- Oct. 10 – Small Systems Wastewater, Goodland
- Oct. 14-15 – Water Distribution and Wastewater Collections, Lyons
- Oct. 15-16 – Wastewater Treatment, Bonner Springs
- Oct. 21 – Ultraviolet for Water and Wastewater Treatment, Garden City
- Oct. 21 – Advanced Wastewater, Holton
- Oct. 22-23 – Wastewater Treatment, Olathe
- Oct. 28 – Applied Math for Wastewater Operators, Dodge City
- Oct. 30-31 – Wastewater Reclamation and Reuse, Goodland.

Call 785/357-4780 or visit www.kwea.net.

Kentucky

The Kentucky Water and Wastewater Operators Association has scheduled an Operator Training Course on Water, Wastewater and Various Topics, Sept. 16-17, in Falls of Rough. Call 502/330-9678 or visit www.kwwoa.org.

North Carolina

The North Carolina AWWA-WEA has these classes:

- Sept. 1 – Piping, Greenville
- Sept. 9 – Advanced Topics in Wastewater Treatment, Burlington
- Sept. 14-17 – Maintenance Technologist Operators School, Raleigh
- Sept. 29 – Sustainability & Backflow/Cross Connection Updates, Greenville.

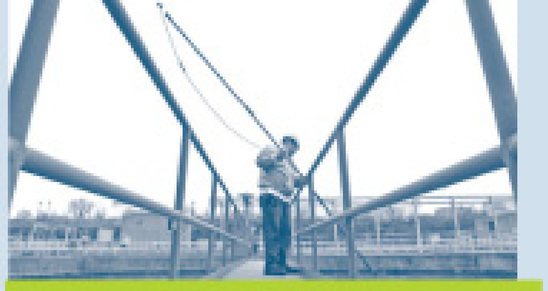
Call 919/784-9030 or visit www.ncsafewater.org.

Wisconsin

The University of Wisconsin-Madison Department of Engineering Professional Development is offering these classes at the Madison campus:

- Sept. 9-11 – Wastewater Treatment Plants: Processes, Design and Operation
- Oct. 5-7 – Designing and Constructing Sanitary Sewer Systems.

Call 608/262-2061 or visit http://epdweb.engr.wisc.edu. tpo



CALENDAR OF EVENTS

Sept. 1-4
Chesapeake Water Environment Association and the Water and Wastewater Operations Association of Maryland, Delaware and the District of Columbia Joint Conference and Exhibition, Clarion Fontainebleau Hotel, Ocean City, Md. Visit www.wwoa-cwea.org.

Sept. 10-12
Canadian National Conference and Wastewater Management Policy Forum, Hilton Fallsview Hotel, Niagara Falls, Ontario. E-mail admin@weao.org or visit www.weao.org.

Sept. 10-11
Georgia Association of Water Professionals, Interstate Water Issues: A Sustainable Future, Marietta Conference Center & Resort, Marietta. Call 770/618-8690 or visit www.gawp.org.

Sept. 13-15
Canadian Residuals and Biosolids Conference, Hilton Fallsview Hotel, Niagara Falls, Ontario. Call 416/410-6933 or visit www.weao.org.

Sept. 13-16
Rocky Mountain Sector AWWA/ Rocky Mountain WEA Joint Annual Conference, Albuquerque Convention Center, Albuquerque, N.M. Call 720/859-4338 or visit www.rmsawwa.net.

Sept. 13-16
WateReuse Symposium, Sheraton Seattle Hotel, Seattle, Wash. Call 206/621-9000 or visit www.watereuse.org.

Sept. 13-16
Pacific Northwest Clean Water Association Annual Conference, Boise Centre on the Grove, Boise, Idaho. Visit www.pncwa.org.

Sept. 13-17
Virginia Water Environment Association Conference, Greater Richmond Convention Center, Richmond. Visit www.vwea.org.

Sept. 14-15
New York Water Environment Association Watershed Science and Technical Conference, Hotel Thayer, West Point. Call 315/422-7811 or visit www.nywea.org.

Sept. 16-18
South Dakota Waste and Wastewater Association Conference, Holiday Inn, Spearfish. Visit www.sdwwa.org.

Sept. 17-18
Maine Wastewater Control Association Fall Conference, Sunday River Ski Resort, Bethel. Visit www.mwwca.org.

Sept. 20-23
Western Canada Water Conference and Trade Show, Winnipeg, Manitoba. E-mail wwall@city-plap.com or visit www.wcwwa.ca.

Oct. 3-11
International Activated Carbon Conference and Courses, Holiday Inn Airport, Pittsburgh, Pa. Call Barbara Sherman at 800/367-2587 or visit www.pacslabs.com.

Oct. 10-14
WEFTEC 2009 Water Environment Federation Technical Exhibition and Conference, Orange County Convention Center, Orlando, Fla. Call 800/666-0206 or visit www.weftec.org.

Oct. 18-20
Atlantic Canada W&WA Conference, Marriott Halifax Harbourfront, Halifax, Nova Scotia. Visit www.wef.org.

Oct. 19-21
North Dakota Water Environment Association Annual Meeting, International Inn, Minot. Visit www.wef.org.

DEWATERING

Septic Receiving Station, 10-gauge double wall stainless steel tank, w/4" flanged inlet. Wash assembly, 12" outlet, flow meter/plug valve rock trap stainless auger/brush and r... stainless st... wa... iron grinde... ch... /7 tooth car... alloy 5HP/3.7KW ... troller/Pc24... interface, ... card reade... inte... stop but... c... sc... a sys... m... # 1005...

JETTERS-TRUCK

2006 GMC TC6500 cab & chassis truck mounted jetting unit w/Jet Eye camera system, 3000 psi @ 50 gpm, 1000 gallons water, 600' hos... cfm b... debris tank and ... nments ...ck!!! RENT ME... tock ...4)

199... 92... excellen..., mounted on 1998 Ford F800, 5.9 diesel hydromatic, 300 gallon water tank. Asking $17,500.

JET VACS

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RENTAL EQUIPMENT

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WATERBLASTING

Gardner Denver 620-671 Detroit 20K @ 11 gpm. **Gardner Denver** IL450- Volvo 20K @ 17 gpm. **Aquadyne** GA 200 variable speed 3116 CAT 20K, 20 gpm. **Aquadyne** 0450DS-Cummins 20K @ 36 gpm. **Jetstream** 4220-Cummins 20K @ 17 gpm. **Jetstream** UNX-6V53 Detroit 10K @ 26 gpm. **NLB**-Ultraclean Cummins 36K, 7 gpm. **NLB** 10-600 Cummins 10K @ 104 gpm. **NLB** 5-250 Cummins 3600 psi, 182 gpm. **US Jetting Sewer Unit** 4K @ 14 gpm.

2002 N... 75... ...0,000 psi, 3 g... railer ...ed, 300' new ho... 20 hrs. ...ct condi-tion. Pr... 5,000

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Andrew Knight
An Original Environmentalist

LEAD OPERATOR
Columbia Boulevard
Wastewater Treatment Plant
Portland, Ore.

Read about original environmentalists like Andrew each month in *Treatment Plant Operator.*

tpo

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1. AZZ INTRODUCES SAFJ LIGHTING FIXTURES

The SAFJ series of lighting fixtures from AZZ RAL Rig-A-Lite feature medium base metal halide and high-pressure sodium lamps, ranging from 35 to 100 watts, for use in the wastewater industry. **713/943-0340; www.rigalite.com.**

2. GARDNER DENVER INTRODUCES NASH VECTRA SX PUMPS

Nash Vectra SX series industrial liquid ring pumps and compressors from Gardner Denver Nash are available in five models from 1 1/2 to 10 hp. The cast iron pumps feature a precision-cast 316 stainless steel rotor and stainless steel-lined body to reduce internal corrosion. They have a vacuum range of up to 29 Hg and compressor pressure up to 20 psig. **800/553-6274; www.gdnash.com.**

3. BADGER METER INTRODUCES SERIES 380, 735 FLOW SENSORS

The Series 380 Btu system impeller flow sensor from Badger Meter Inc. features two temperature probes and Btu calculator for metering hot or cold systems, while the Series 735 is designed for medium- to low-temperature applications, or where a metal sensor is not required. The Series 380 is available in 3/4 inch, 1 inch, 1 1/4 inch, 1 1/2 inch and 2 inch sizes, while the 735 is available in 1/2 inch, 3/4 inch and 1 inch sizes. **800/338-0312; www.badgermeter.com.**

4. APPLETON INTRODUCES POWERPLEX PANELBOARD

The PowerPlex panelboard from Appleton features a new design for Class 1 Zone 1 and Class 1 Zone 2 environments where explosive fumes might be present. The panelboard transfers its flamepath protection from the enclosure to individual circuit breaker housings. The component-level protection provides increased installation flexibility, improved reliability, while eliminating the need for external conduit or cable seals. **800/621-1506; www.appletonelec.com.**

5. BORD NA MONA INTRODUCES PURASAF SUBMERGED FILTER

The PuraSAF submerged aerated filter from Bord na Mona is made of recycled plastic media designed to act as biomass carriers that provide a large surface area. The filter operates in an upflow packed bed configuration that is fluidized for cleaning and desludging. In aerobic mode, the filter offers a small footprint and low headloss solution for BOD, nitrification and denitrification. It also can be used in an unaerated mode as a low-cost tertiary filter that approaches sand filter quality. **336/547-9338; www.bnm-us.com.**

6. DRUM-MATES OFFERS HAND-DISPENSING NOZZLE

The DM-85HFR Series hand-dispensing nozzle from Drum-Mates Inc.

can move liquids from virtually any storage device, whether pumping or gravity transfer, providing up to 40 gpm at up to 150 psi. Offering a choice of 1/2-inch, 3/4-inch or 1-inch hose barb connections, the nozzle is available as a drum transfer kit option with flexible polypropylene dispensing hose and 2-inch NPT bung mount connector. The Xtreme Duty model is chemical-resistant and uses polypropylene, Hastelloy and Viton components. It also is available with stainless steel and EPDM internals. **609/261-1033; www.drummates.com.**

7. COBRA INTRODUCES UNIVERSAL PORTABLE CONTROL CONSOLE

The Universal Portable Control Console from Cobra Technologies includes a rack-mounted, solid-state computer and 10.4-inch sunlight-readable touch screen. The controller can be used with a Cobra Inspection System or any U.S.-made mainline inspection system controller, multi or single conductor. The controller is available with the PACP/WRc certified Cobra Touch Data Logger. **800/443-3761; www.cobratec.com.**

8. ITT INTRODUCES CHARGE N FLOW PORTABLE PUMPS

Charge N Flow portable pumps from ITT Corp. are rechargeable, submersible and feature multiple power options. They can pump hot or cold freshwater, seawater, antifreeze and diesel. The unit measures 5.5 inches tall and 1.5 inches in diameter and can pump up to 100 gallons of water per charge. The kit comes with a 12-volt 280-gph pump, 8 feet of lay-flat hose, spray nozzle, enclosed battery, AC battery charger, battery clip adapter and vehicle power adapter. It also includes a filter for use in submersible mode. **978/281-0440; www.itt.com.**

INTERNATIONAL PAINT INTRODUCES CHEMICAL-RESISTANT COATING

Ceilcote 600HB Flakeline from International Paint Protective Coatings is a two-component, high-build, glass flake-reinforced epoxy system offering improved chemical resistance to alkalis, inorganic acids and many aromatic and aliphatic solvents. The coating is designed to be spray applied in a single coat at a thickness of 30-50 mils DFT, often without a primer. **800/525-6824; www.ceilcotecc.com.**

(continued)

product spotlight

IntelliPro System Monitors and Controls Processes

By Ed Wodalski

The IntelliPro process management system from Aqua-Aerobic Systems Inc. combines the process monitoring power of a supervisory control and data acquisition (SCADA) system with integrated comparative analysis and operator guidance.

"Instead of mechanical functions, you will look at DO, TSS, pH and everything related to the process and automatic control of that process," says Manuel de los Santos, senior applications engineer, biological processes and membrane systems.

Designed to link operations, equipment and treatment objectives, the monitoring system actively influences the treatment process by proactively responding to changes as they occur.

Process information is gathered from field instruments and sent to the main system programmable logic controller (PLC), which ultimately controls all equipment operation based on instrument feedback and instructions provided by the IntelliPro system.

Operating data is scanned from the process PLC into the IntelliPro database every six seconds. Data is analyzed and evaluated through algorithms in the IntelliPro system and preset parameters for optimum process management. In addition to seeing what is currently happening in the treatment plant, trending enables operators to access historical data. For example, they can look back six months ago to view the effects of a large storm.

System features include automatic calculation of influent flow, mixed liquor suspended solids (MLSS) adjusted to low water level (LWL), solids retention time (SRT), sludge volume index (SVI), food to mass ratio (F/M), current mass loading compared to design loading, oxygen uptake rate (OUR) and sludge yield (Yn).

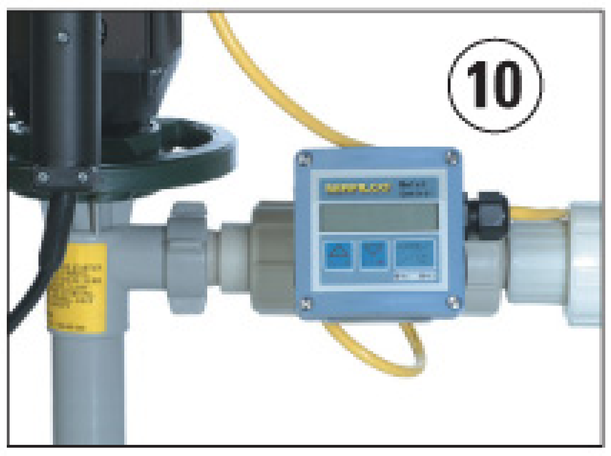
Other features include active (automatic) or passive (monitor) system adjustment to enhance energy efficiency and process control, including dissolved oxygen concentration, reaction time adjustment, operation based on F/M, SRT or MLSS set-points, settling adjustment based on effluent TSS monitoring, recommended optimum cycle structure, real-time and historical process trending and on-line nutrient removal optimization.

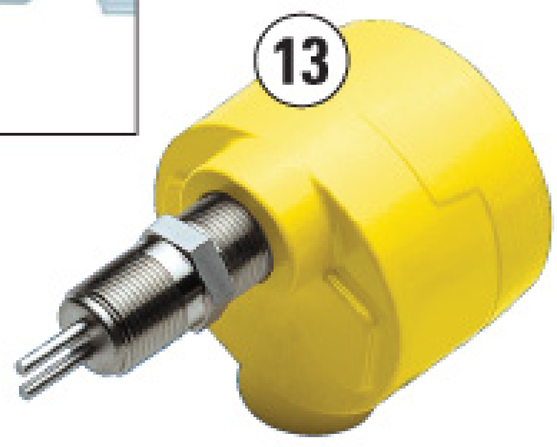
IntelliPro process management system from Aqua-Aerobic Systems Inc.

"One of the main features is the automatic process optimization," says de los Santos. "If you want to target the mixed liquor concentration, you put in a number and the system will target it automatically by changing the pump time or pump rate for sludge.

"Another important focus is troubleshooting. There are automatic troubleshooting features instead of alarms that we call BioAlert." The alerts let the operator know if the system is running within the present limits and what corrective measures should be taken. The system also can be remotely accessed by Aqua-Aerobic for further troubleshooting.

The base package includes level indication, DO control, pH and temperature monitoring, effluent TSS, and reactor MLSS. Optional processes include ammonia nitrogen, nitrate nitrogen, phosphate, oxidation/reduction-potential, sludge interface level and total organic carbon monitoring and control. **For information: 815/654-2501; www.aqua-aerobic.com. tpo**





9. HACH ADDS THREE TNTPLUS REAGENT SETS

TNTplus reagent sets from Hach Co. are designed for copper, high-range nitrite and mercury-free chemical oxygen demand testing in wastewater applications. The products work with DR 2800 portable and DR 5000 UV-Vis spectrophotometers, providing bar code scanning and reduced chemical exposure through self-contained packaging. **800/227-4224; www.hach.com.**

10. SERFILCO OFFERS LINE OF DRUM PUMPS

Drum pumps of CPVC, polypropylene, stainless steel or aluminum, as well as Kynar for difficult-to-pump solutions, are available from Serfilco Ltd. The pumps are designed for use with acids, sodium hypochlorite and alkalines, and will pump viscous liquids of 700 or 4,000 SUS. Options include wall bracket, nozzle, mixing tube and strainer. **800/323-5431; www.serfilco.com.**

11. PULSAFEEDER OFFERS XPV SERIES PUMP

The Chem-Tech XPV series pump from Pulsafeeder Inc. combines variable-speed peristaltic technology with control electronics and offers a variety of input signals and onboard timer programs. The electronic management system matches the variable-speed motor to real-time dosing requirements as directed by a 4-20mA signal, Hall effect or dry contact pulse input, external stop or manual operation in fixed speed mode. The pump also can be programmed with a cycle timer to automatically run at set intervals, or with a daily timer. **941/575-3800; www.pulsafeeder.com.**

12. WILDEN OFFERS AIR-OPERATED, DOUBLE-DIAPHRAGM PUMPS

The Advanced PX400 and PX800 air-operated, double-diaphragm plastic pumps from Wilden are available in two sizes (1 1/2 inch and 2 inch) and a variety of elastomer options, including Teflon and PTFE, to meet abrasion, temperature and chemical-compatibility needs. The pumps also feature a bolted configuration for product containment, while the redesigned liquid path reduces internal friction to maximize output. **909/422-1700; www.wildenpump.com.**

13. FCI OFFERS FLT93 TANK LEVEL SWITCH

The FLT93 tank level switch from Fluid Components International LLC is rated for Safety Integrity Level 2-compliant service. Depending on the model, the switch measures tank level or interface up to plus-or-minus 0.1 inch with a repeatability of plus-or-minus 0.05 inches. It operates within temperatures of -100 degrees F to 500 degrees F and has been pressure tested to 3,500 psig. The electronic control circuit can be integrally mounted with the sensing element or it can be mounted in a remote location. The standard enclosure is made from a coated aluminum alloy, is suitable for use in hazardous locations and is rated for NEMA Type 4X environments. **800/854-1993; www.fluidcomponents.com.**

14. MOYNO OFFERS ANNIHILATOR REDUCTION UNIT

The Annihilator shaft solids reduction unit from Moyno Inc. is designed for installations including sewage lift stations, headworks and

sludge-processing systems. A counter-rotating, hexagonal shaft design coupled with five-tooth, hardened-steel cutters provide shredding strength to process 300 to 4,250 gpm of influent. When properly specified, the unit prolongs the service life of downstream equipment. The device is fitted with toothed cutting spacers that increase efficiency, further decrease particle size, and reduce the risk of failure from ragging. A seal cartridge assembly with mechanical seal and bearing on separate stainless steel sleeves allows quick replacement without purchasing complete cartridge designs. **877/486-6966; www.moyno.com.**

15. ABRESIST OFFERS CERAMIC-LINED PIPING

Basalt and alumina ceramic-lined piping from Abresist Corp. are designed to last 5 to 15 times longer than 1/2-inch wall cast iron. Pipes, elbows and fittings are custom-engineered for each application in a variety of end connections. Most common coatings are available for outside corrosion protection, as well as hot-dipped galvanized or stainless steel casings. **800/348-0717; www.abresist.com.**

16. CONTROL MICROSYSTEMS INTRODUCES PUMP PACKAGE

The FlowStation 110 pump controller package is designed for use in storm and wastewater lift stations and features a built-in Web server and user-friendly interface. The package can be used for stand-alone installations or as part of a SCADA network. Components include a dedicated pump controller, color touch-screen operator interface, GPRS modem for remote Web browser, SMS, e-mail alarming, serial or ethernet radio for SCADA connectivity, as well as BlackBerry interface. **www.controlmicrosystems.com.**

17. GF PIPING INTRODUCES PVC AQUA BUTTERFLY VALVE

The Type 565 Aqua Butterfly Valve from GF Piping Systems is designed specifically for water applications. The PVC valve with EPDM seal is available in sizes from 2 to 12 inches with either a lockable hand lever that moves in five-degree increments, or with a gear-operated wheel. The glass-filled polypropylene body and Q-shaped O-ring seal eliminate the need for flat gaskets. Other features include bidirectional capability, operating temperatures from 32 to 142 degrees F and 150 psi rating. **800/854-4090; www.gfpiping.com.**

ROMTEC OFFERS CONCRETE, FIBERGLASS LIFT STATIONS

Lift stations from Romtec Utilities are available in concrete or fiberglass in diameters from 4 to 12 inches and depths in excess of 40 inches. Features include valve vaults, flow meters, grinders, control panels, generators and telemetry SCADA systems. **541/496-9678; www.romtecutilities.com. tpo**

CLARIFICATION

Information on the WEMCO Hydrogritter grit removal system can be found at:

Weir Specialty Pumps
801/359-8731
www.weirpowerindustrial.com

Because of incorrect information supplied to *TPO,* a different company division and phone number were listed in the August story on the Sussex (Wis.) Regional Water Pollution Control Facility. We apologize for this error.

tpo CLASSIFIED ADVERTISING

TREATMENT PLANT OPERATOR

SEPTEMBER

BOILERS

2006 Bryan Water Boiler. Model CLM-210-W-FDGG, two million BTU. Operates on methane and natural gas. Well maintained. Call Dover, Ohio WWTP for details. 330-343-3443. (O8)

DEWATERING

Alar, Model 650, very good cond. Completely automatic with all controls and panels, filters down to 1/2 micron, sludges generated by septic and grease haulers. Reducing BODs, F.O.Gs, TGS, total phosphorus, meters and NH3-N. 770-917-0377. (PBM)

Aqua-Zyme 30-yard Dewatering Box, 3 years old, one owner. Excellent condition. Poly-blend polymer mixer available. $30,000 OBO. 317-539-7304. (P11)

WANTED

QUALITY SURPLUS POLYMER WANTED: Email product number, polymer form, purchase date and quantity. Will attempt to make a cash offer. Also I can offer aggressive prices on our polymer sales to you. Email stuart@acpsouth.com. (O11)

WATERBLASTING

2 Gardner Denver 610XVSDT variable speed, Cummins, 25gpm/10k, 43gpm/7.5k, GD 610DT Cummins, 22gpm/10k, 2 American Waterblaster, 3-53, 12gpm/10k. O'Connell Jetting Systems. Mike 707-747-4848. oconjet@pacbell.net. (C9)

NLB 4075D, 40k @ 3 gpm waterblaster, factory trailer mounted with air compressor, includes new hoses in box, 620 hrs. on machine, serviced by NLB, perfect machine, stored inside. $38,000. Contact Pat 973-476-7194. (CP9)

2006 Jetstream 3600 Series, 170 hp John Deere, 1100 hrs., 27 gpm @ 10,000 psi. $45,000. 440-813-0025. (P8)

2006 Hammelmann pump, driven by Caterpillar engine, 750-1,000 HP. Currently set up at 23,000 psi @ 53 gpm. Low hours, container set up by Hammelmann, noise insulated, 800 gallon stainless steel water tank. Replacement value $400K USD. Offers considered $200K USD+. Contact Byron; byron@interclean.co.nz or PH 011-64-275-365-276. (PT8C9)

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$2.00 per word, per month, with a 20-word minimum or $40.00. $2.00 extra per bold word (key words only).

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Hydraulic Institute Releases ANSI/HI Pump Standards

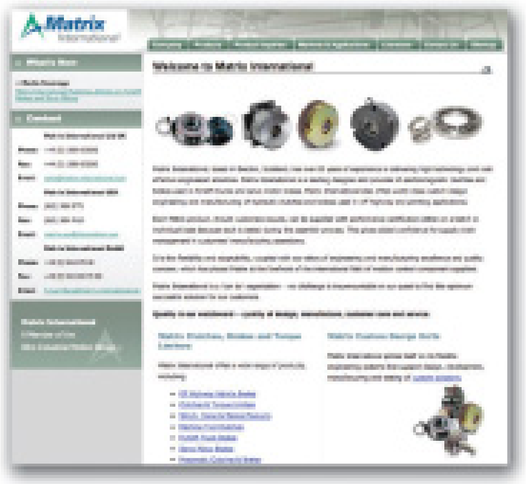
ANSI/HI pump standards, Version 2.1, are available on CD from the Hydraulic Institute. One new standard is for reciprocating positive displacement pumps, typically used for the injection of chemical additives, proportional blending of multiple components or metered transfer of a single liquid. For more information, call 973/267-9700 or visit http://estore.pumps.org.

Parkson Opens Florida Water Campus

Parkson has completed work on its Fort Lauderdale, Fla., Water Campus. The complex includes the company's new headquarters building and water research facility.

Matrix International Launches New Web Site

Matrix International, an Altra Industrial Motion company, has launched a new Web site, www.matrix-international.com, which provides product information on its brakes for off-highway vehicles, clutch and torque limiters and pneumatic clutches.



Philadelphia Mixing Introduces Lease, Rental Programs

Philadelphia Mixing Solutions is offering lease and rental programs for wastewater process equipment, including chemical processing, wastewater biological treatment, industrial wastewater treatment, tank storage and more. Agreements are individually tailored with up to half the total lease or rental cost applied to the equipment purchase.

Wallingford Software Acquires InfoStream

Wallingford Software, a leader in hydraulic and hydrologic water modeling and asset management software, has acquired information software developer and systems integrator InfoStream and its mobile technology.

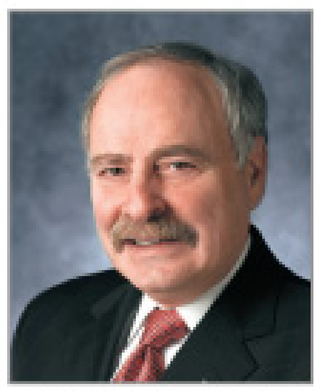
Wilo Consolidates Companies

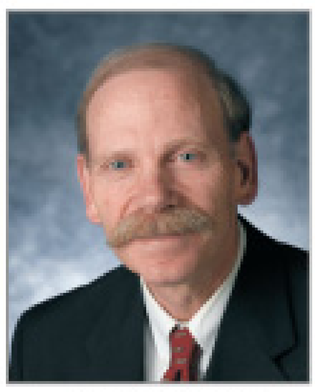
Pump manufacturer Wilo has consolidated its two U.S. companies, Wilo USA LLC and Wilo EMU USA LLC, into a single organization that will do business as Wilo USA LLC. Mike Easterly will serve as CEO and president of the new company. All production and assembly for the U.S. market will be located at the company's Thomasville, Ga., facility, headed by Terry Rouse. Sales will be based out of the Melrose Park, Ill., office.

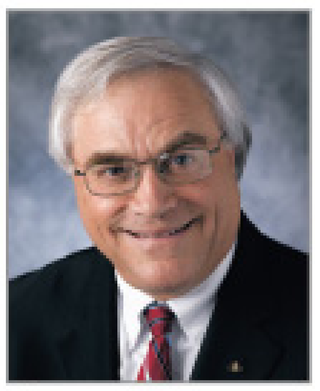
D&B Adds Staff; Executive Honored

Harvey Moutal, P.E., has joined the wastewater collection and treatment division of Dvirka and Bartilucci Consulting Engineers as vice president. He has 37 years of water and wastewater experience and is based out of the company's White Plains, N.Y., office. Robert Raab has joined the company as senior project manager. He has 35 years of environmental and civil engineering experience and is based out of the company's Woodbury, N.Y., office.

Executive vice president Steven A. Fangmann, P.E., was inducted into the New York Water Environment Association's Hall of Fame. He also received the Board of Directors Service Award for 2008.


Harvey Moutal


Robert Raab


Steven A. Fangmann

Smith Flow Control Adds Wastewater Representatives

Smith Flow Control Inc. has added AMD Solutions, BL Anderson, Instrument and Supply Inc., TEMSCO Inc., and Waterworks Systems and Equipment Inc. to its list of representatives. AMD will cover North and South Carolina; BL will service Indiana; and Instrument and Supply will cover Arkansas, Oklahoma, Tennessee, Mississippi, Kentucky and Colorado. TEMSCO's territory includes Alabama, Georgia and the Florida Panhandle, while Waterworks Systems will cover Michigan and northern Ohio.

Gardner Denver Marks 150th Anniversary

Gardner Denver Inc., Quincy, Ill., marks 150 years of manufacturing this year. The fluid transfer technologies company was founded by Robert Gardner, who manufactured the first effective speed control for steam engines in 1859.

Smith & Loveless Redesigns Web Site

Smith & Loveless Inc. has redesigned its company Web site, www.smithandloveless.com. The new site offers product and company information, product development news, product videos and upcoming events. tpo

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