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John LaRocca,
Superintendent of
wastewater operations
Village of Roselle, Ill.

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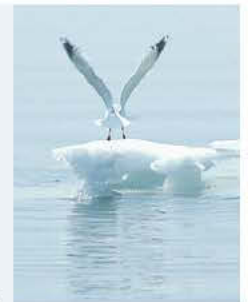
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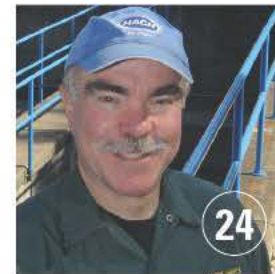
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on the cover

The clean-water profession has a family feel to John LaRocca, superintendent of wastewater operations in Roselle, Ill. He enjoys close ties with his team and has made enduring connections while serving on the board of the Illinois Association of Water Pollution Control Operators (IAWPCO) and interacting with other clean-water professionals around the state. (Photography by Rob Hart)

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let's be clear

Who Were Your Mentors?

SOMETIMES WE GET OUR BEST LESSONS NOT FROM BOOKS OR TEACHERS BUT FROM THE EVERYDAY WISDOM OF PEOPLE WE ENCOUNTER IN DAILY LIFE

By Ted J. Rulseh, Editor

“When I was a boy of fourteen, my father was so ignorant I could hardly stand to have the old man around. But when I got to be twenty-one, I was astonished at how much he had learned in seven years.”

Mark Twain



Mentoring is a big topic in the clean-water business. As many veteran operators and supervisors prepare to retire, their organizations need qualified replacements. One of the best ways to groom new people is to assign them good mentors.

The right mentor at the right time can do wonders for a person's career. I could name a couple of former bosses without whose help I could never have done what I do professionally today.

But often some of our best mentors are not official sources like teachers, trainers or supervisors.

They are people we happen to encounter who at a given moment turn out to be wise, or happen to say just the thing we need to hear at the time.

Sometimes that's a parent. I've always loved the Mark Twain quote above, and it rings very true for me. Other times it's someone we meet almost at random. Example: When I was 29, not long after our first daughter was born, I was at a gym playing basketball and happened to chat with a guy a few years older.

I confided how my wife didn't care for me playing basketball two nights a week now that we had a baby at home. In a bit of macho bluster, I added, “That's too bad — because I'm playing and that's it.”

He looked at me and said, “You know, she's right. You're not a kid anymore. Maybe you should be spending more time at home.” I took it to heart. I didn't give up what was after all my favorite sport, but I dialed it back and was never sorry.

MAKING UTOPIA

I got another lesson back in college when I took a course on Utopia during the January interim session. (This qualifies as a lesson from an unofficial source because interim courses

often had less to do with learning than with finding a way to earn a course credit while saving the maximum time for drinking beer.)

The idea was that our group of 20 students would read books about different visions of perfect societies, then use what we learned to devise such a place for ourselves. I started with a pretty clear idea of what Utopia was, and it included a culture that relied to the minimum on mechanical, energy-consuming devices.

As we began shaping our Utopia, I realized that mine was a minority view — that my classmates weren't much interested in a place where people cut wood to heat their homes, got about on bicycles, and washed clothes by bashing them on rocks. In other words, there were more ways of looking at the world than my own.

I came away pleasantly humbled: The experience helped me shake off a sort of dogmatism I badly needed to get rid of. And I suspect that was just the outcome our wise young professor wanted for us. Years later, I took the opportunity to thank him.

LEARNING THE ETHIC

Another lesson, this one in the work world, came from a crusty old lifer in a soda pop plant where I worked for a summer during college. Back then I looked at work as something I was forced to do to earn money. I did what I was told and put in my time (often not cheerfully), and that was it.

Often some of our best mentors are not official sources like teachers, trainers or supervisors. They are people we happen to encounter who at a given moment turn out to be wise, or happen to say just the thing we need to hear at the time.

One day after lunch, after hearing me grumble at the break table, the old-timer pulled me aside and essentially told me I needed to get my mind right. "If you're on their payroll, you need to be on their team," he said. "Take an interest in your job. You'll be a lot happier."

Of course, he was right. And that brings up a favorite work story of mine. In the 1890s, a gang was working on the railroad tracks out west when a train pulled up and out stepped the president of the railroad.

He gave a short speech, after which an old track worker raised his hand and said to the president, "You and I started work on the very same day 35 years ago. How is it that you're up there and I'm still here?"

The president replied, "That's easy. You went to work for 90 cents an hour. I went to work for the railroad." **tpo**

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LEFT: A restored public park area at Brightwater Center. ABOVE: Interactive displays make learning fun at the center's exhibit hall.

Tell Us What You Want

KING COUNTY RESIDENTS HAVE A PLACE TO LEARN AND GROW AT THE NEW BRIGHTWATER ENVIRONMENTAL EDUCATION AND COMMUNITY CENTER

By Briana Jones

To connect with the public, the King County (Wash.) Wastewater Treatment Division needed a place where people could gather to learn where water comes from and why wastewater treatment is so important.

The Brightwater Environmental Education and Community Center (BEECC) now provides a place where community members can meet, socialize, and learn about their environment.

"The community said they really wanted three things out of the center: a park area, a community center that could be rented out for events, and an environmental education center," says Susan Tallarico, Brightwater Center director.

Built as mitigation for the treatment facility to address construction and operations impacts of the project on the surrounding community, the 15,000-square-foot center includes an interactive exhibit hall, two classrooms, a college-level laboratory, conference and event spaces, a kitchen and administrative offices.

The rental space can accommodate up to 250 people and is designed for community group meetings, conferences, weddings and other special events. The large room can be broken down into smaller configurations for multiple groups.

HELPING HANDS

The \$8 million center involved 10 years of planning and coincided with a treatment plant expansion. The Brightwater Clean Water Treatment Facility was built in response to growth in King and Snohomish counties. The new facilities include the treatment plant, wastewater conveyance, and a marine outfall. Operations began in September 2011 and the entire system is scheduled for completion in 2012.

Many people were involved in developing and designing the center. "The King County Wastewater Treatment Division assigned several current or former operat-

ing supervisors to the design of the project, including the Brightwater Environmental Education Community Center," notes Ron Kohler, Brightwater Clean Water Treatment Facility assistant manager. "The operation and maintenance team's focus was on the maintainability of the BEECC, including materials of construction."

In addition to the treatment plant staff and engineers, a local teacher task force helped create the Brightwater Center.

"There was a group of teachers who were really interested in the project, and they really were pushing for the environmental education center," Tallarico says. "They were really involved in the early stages, from the designs of the building to possible program ideas."

The King County Wastewater Division and Friends of the Hidden River, a nonprofit group of local teachers, secured more than \$1 million in grant funding for the facility. "The teacher task force was integral in helping raise additional funds," says Tallarico. "King County worked with them to get additional funds that allowed our building to be LEED Platinum certified and to outfit some of our classrooms to a high-standard laboratory level."

As a LEED-certified building, the center includes:

- Use of recycled materials
- Reuse of existing on-site and salvaged materials when possible
- Natural ventilation and daylighting
- Energy-efficient lighting
- ENERGY STAR appliances
- Radiant floor heating from the treatment plant's thermal energy production
- Washington-made solar panels
- Green building features used as teaching tools
- Reclaimed water used for irrigation and toilet flushing.

NOT HIDING

The 36 mgd (design) wastewater treatment plant serves 105,000 people and will eventually serve 190,000 after Phase 2 of the expansion, to be completed by 2040.

What's Your Story?

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

(continued)

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FAR LEFT: The center's programs include field investigations with students. ABOVE: Overview of the Brightwater Environmental Education and Community Center. LEFT: The center's grand opening included education for families.

"The kids see the equipment and the complexity of wastewater treatment and they are impressed. Making an impression on a child is the way to have them think about their actions. They know how throwing the wrong things down the toilet can cause us problems. I see my staff grinning when the tours of children go by."

RON KOHLER

"We're not hiding the center," says Tallarico. "We are literally right next to the treatment plant. We are really working with the treatment plant side of things because we use it as a way of teaching folks. We do tours of the treatment plant all the time, from fourth graders all the way up to adults. That's just one part of the education that we provide."

Kohler adds: "Having the center on the treatment plant site is very rewarding. The treatment plant staff sees the public school tours coming by several times a day and the staff knows the children are being educated about wastewater treatment and the environment."

"The kids see the equipment and the complexity of wastewater treatment and they are impressed. Making an impression on a child is the way to have them think about their actions. They know how throwing the wrong things down the toilet can cause us problems. I see my staff grinning when the tours of children go by."

WELL-ROUNDED EDUCATION

The center offers a place where groups can learn how different aspects of the treatment process work and what is involved in cleaning water. "The story of where our water comes from, how we're connected to our water, where our water goes, how our water gets cleaned — that whole story is something not many people are aware of," says Tallarico. "Here, any person can walk in, get some information, and play with all of our fun displays. They're all very hands-on, active displays."

The exhibit hall includes information display panels along with six interactive displays. Three video monitors continuously show edu-

cational information. There is a high-definition video art installation called "Circulator" by local artist Jim Blashfield. It has multiple screens, including a portal hole on the floor and a seven-minute video interpretation of the water's journey through the human-made and natural worlds.

One of the main displays focuses on water use in the home and includes a toilet, shower, refrigerator, kitchen sink and cabinets. The toilet has information about what should and should not be flushed. The shower door has a comparison diagram of water use broken down by country.

The refrigerator contains gallon jugs with cards that explain how many gallons of water it takes to produce different types of food. The kitchen cabinets have typical household cleaning products with tags giving alternative recipes for creating environmentally friendly cleaning solutions.

"A lot of people think environmental education is taking kids out in the woods or to play in the river," says Tallarico. "That's not really the scope of environmental education. Environmental education is teaching people about all the aspects of their environment. A lot of those aspects happen to be man-made."

"And it's talking about that connection of how humans affect the planet. Talking about wastewater and the waste that we produce is a perfect example of getting those messages across that while we alter the environment, we can also clean it up and protect it through a wastewater treatment facility." **tpo**

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JUST ONE BIG FAMILY

PLANT SUPERINTENDENT JOHN LaROCCA FEELS KINSHIP NOT JUST WITH HIS OWN TEAM BUT WITH INDUSTRY COLLEAGUES AT LARGE THROUGH SERVICE TO HIS STATE ASSOCIATION

By Ted J. Rulseh

THE CLEAN-WATER PROFESSION HAS A FAMILY FEEL TO JOHN LaROCCA, and not just because his father introduced him to it.

The profession feels like a family because of the closeness among his team at the Village of Roselle Public Works Department, where he is superintendent of wastewater operations. Then there are connections he has made while serving on the board of the Illinois Association of Water Pollution Control Operators (IAWPCO), and interacting with other clean-water professionals around the state.

"I've met so many great people," says LaRocca, a member of the industry for 36 years, since age 18 (and arguably even longer). "One thing I've always said about wastewater operators: I don't think I've ever met a bad one. There are so many good people in this industry it's almost unbelievable. Almost everybody I meet, everybody involved in the associations, they are just really nice, great people. I am just elated to be a part of this profession."

STARTING YOUNG

Roselle is a village of about 23,000 in Northeastern Illinois. The Public Works Department's Wastewater Division oversees two wastewater treatment plants, 11 pump stations and about 90 miles of sewers with a team of nine, which LaRocca leads.

LaRocca grew up in the nearby Village of Addison, where his father was wastewater plant superintendent for many years. "I would go to work with my dad when I was a kid," LaRocca says. "I got to see how he interacted with his team, and I talked to the guys, as much as a kid could do. My dad would put me to work, cleaning baseboards in the lab and doing other menial tasks, and he would pay me a couple of bucks."



John LaRocca, superintendent of wastewater operations, Village of Roselle (Ill.) Public Works Department. (Photography by Rob Hart)

After high school, LaRocca tried college, and when it didn't work out, he entered the wastewater profession. "I've always had a passion for water," he says.

His father helped him land a job with Citizens' Utilities, a private operations company, working in the Village of Bolingbrook. After a couple of years, he moved to Salt Creek Sanitary District in Villa Park for four years, and then hired on with Roselle. Four years later, he returned to Salt Creek, and 18 years after that he moved back to Roselle in his current job as superintendent.

TWO FACILITIES

Of Roselle's two treatment plants, the larger is the 2 mgd (design) activated sludge Devlin Wastewater Treatment Facility. Its average flow of 1.65 mgd can swell to 10 to 12 mgd during heavy rains. A 2.84-million-gallon equalization basin and 700,000-gallon excess flow clarifiers help handle high flows.

"When we get torrential downpours, we still get excess flow discharges, but having that additional 35-million-gallon capacity has cut those in half," says LaRocca, who holds a Class 1 wastewater operator license. The excess flow clarifier is similar to a primary clarifier, except that it has no collector inside. Solids simply settle to the bottom and are pumped to the plant headworks when the high-flow event is over.

The Devlin plant has tertiary treatment with Hydro-Clear sand filters (Siemens Water Technologies Corp. – Zimpro). "We installed them in 1986," LaRocca says. "It's a good design, and it works well. Our annual average effluent TSS is 2 mg/l, and BOD is about the same." The plant discharges to Spring Brook Creek, a tributary to Salt Creek.



ABOVE: John LaRocca checks on the new sludge press from BDP Industries. BELOW: The Roselle team includes, from left, Botterman plant lead operator Joe Montefalco, collection system operator Jim Campbell, John LaRocca, operator Ron Baird, and Devlin plant lead operator Jeff Peto.



profile



**John LaRocca,
Village of Roselle, Ill.**

TITLE:
Superintendent of wastewater operations

EXPERIENCE:
36 years

DUTIES:
Oversee two treatment plants,
11 pump stations, 90 miles of sewer

CERTIFICATIONS:
Class 1 Wastewater Operator

AWARDS:
2007 nomination and 2010 winner,
Operator of the Year, Illinois Association
of Water Pollution Control Operators

GOALS:
Continue discharging the best effluent
possible and producing the highest-quality
biosolids; train a capable successor and
continue to enjoy the work

GPS COORDINATES:
Latitude: 42°1'6.59"N;
Longitude: 88°2'17.18"W

“You need to be reasonable and allow your employees to be part of the operation. I let them do their jobs and think for themselves. If they need help, they know where I am. My door is always open. We solve problems collectively.”

JOHN LAROCCA

The other plant, the 1.4 mgd (design) Botterman Wastewater Treatment Facility, has oxidation ditch treatment followed by secondary clarifiers. The plant discharges to the West Branch of the DuPage River. Both plants use aerobic digestion to produce Class B biosolids for land application.

The Devlin facility was nominated twice for the IAWPCO Group 1 Plant of the Year Award, and won it in 2002. The Botterman plant received a Clean Water Award from the Conservation Foundation and the DuPage River Coalition in 2001. “Both our facilities are well run and produce a pristine effluent,” says LaRocca. “We’re very proud of the work we do.”

ALL ABOUT THE TEAM

To run the plants and related facilities, LaRocca relies on lab technician Bob Kappler, lead operator Jeff Peto and operator Ron Baird at the Devlin plant, lead operator Joe Montefalco and operator Mike Szmergalski at the Botterman plant, and collection system operators Roger Karner, Jim Campbell, and Jim Mrugacz. They are a highly experienced group, most with 25 to more than 30 years with the village.

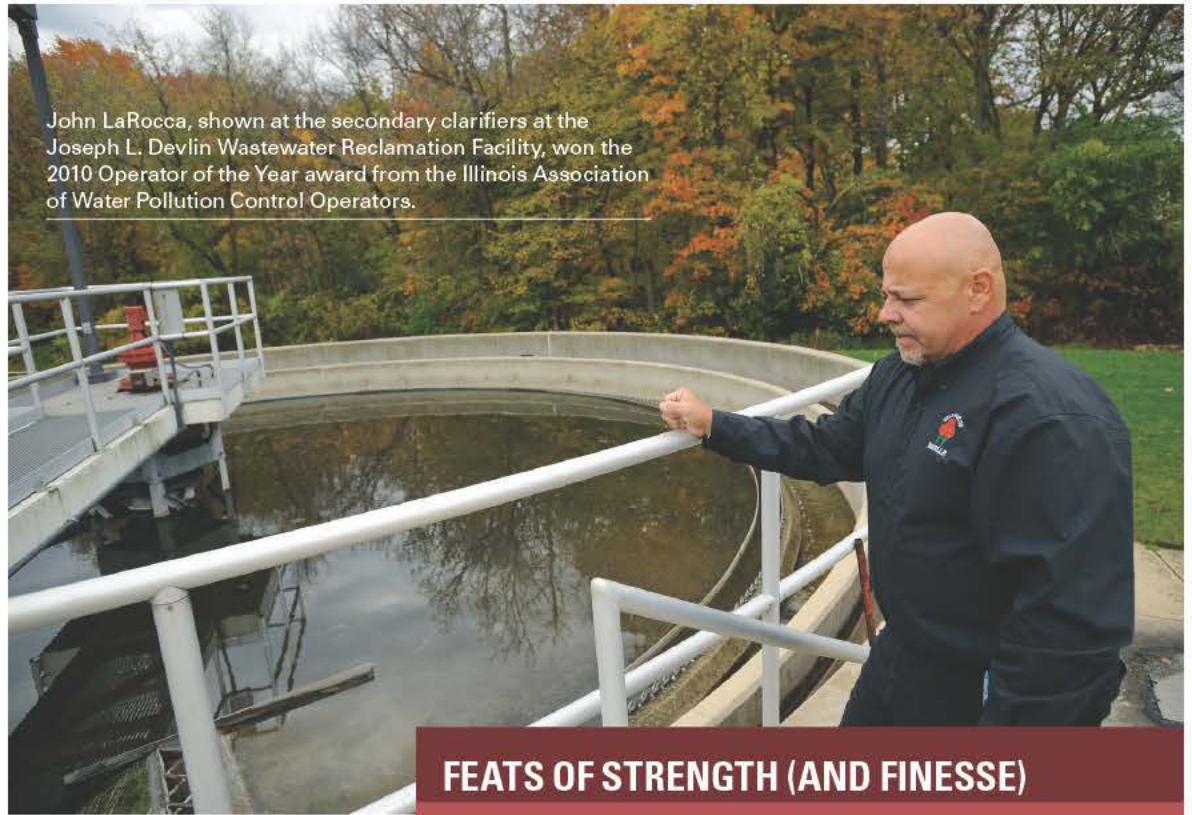
“I can’t give enough credit to the team here,” LaRocca says. “They are a phenomenal group of guys. They really excel in all Public Works duties. Besides the wastewater facilities, they work on water main breaks and plow snow. They are a pretty diverse group. They have a lot of talent.”

LaRocca tries to draw out his team members’ talent by treating them like true professionals. “You need to be reasonable and allow your employees to be part of the operation,” he says. “I don’t rule with a heavy hand. I let them do their jobs and think for themselves. I’m here to guide them along the way. If they need help, they know where I am. My door is always open. We solve problems collectively.”

“We create an environment here where people get up in the morning and enjoy coming to work. We do things together outside of work. I have the guys over to my house every year for a Christmas party. We enjoy each other’s company. We’re like an extended family. We have our disagreements, but in the end we all get along. I would say that’s a major reason everybody has stayed here as long as they have.”

PERFORMANCE PAYOFF

The teamwork pays off in permit compliance and efficiency. LaRocca says the village has been free of permit violations for about 20 years. Plant equipment runs reliably because team members care for it diligently.



John LaRocca, shown at the secondary clarifiers at the Joseph L. Devlin Wastewater Reclamation Facility, won the 2010 Operator of the Year award from the Illinois Association of Water Pollution Control Operators.

FEATS OF STRENGTH (AND FINESSE)

In the early 1980s, John LaRocca was a competitive arm wrestler. In fact, he won Illinois state championships in 1980 and 1981, and in 1980 finished fourth nationally and sixth in an international tournament, all in the heavyweight division.

“A fellow I was working with at the Village of Roselle was involved with the local arm wrestling scene,” LaRocca recalls. “Back then there was an organization that held arm wrestling tournaments at local bars. I got involved in it and started doing fairly well. I met some people along the way who taught me the tricks of the trade.”

LaRocca was a weightlifter, and he had to learn quickly that arm wrestling was not all about muscle. “There is more to it than strength,” he says. “There’s technique, and there’s speed. There are a lot of little things you can do.”

One trick he learned from a lightweight division competitor helped him win a number of matches. “When you and your opponent first grasp each other’s hands and the referee is straightening out your wrists and asking if you are ready, your fingers are in contact with the soft tissue area behind the other guy’s thumb,” LaRocca says.

“The referee says, ‘Ready ... Set,’ and as soon as he says ‘Set,’ you dig your fingers and squeeze as hard as you can behind your opponent’s thumb. More times than not, that will startle him for a split second. It gives you a jump on him and often you can get him down, just from that little diversion.”

LaRocca gave up the competition after the 1981 state championship — he was just too busy with work and family life.

“They treat all the equipment as if it were their own,” LaRocca says. “Because of that, we have few mechanical breakdowns. A lot of our equipment still looks brand new, even though it is 10, 12 or 15 years old. Our

Vac-Con combination sewer cleaning truck is a year 2000 model. If I sent you a picture of it, you would swear it's brand new. They take care of all the equipment in that same manner, and because of that, it lasts, and that saves money for the village."

LaRocca counts on the team to step up in difficult times, such as for major storms and plant upsets. On one occasion, the team arrived for work in the morning to find that a secondary clarifier at the Devlin plant had overturned. The sludge blanket had denitrified and floated. "At that point, we had sludge flowing over the weirs, blinding the sand filters," LaRocca recalls. "There was actually no flow leaving the plant.

"What had happened was that a part-time employee had shut the collector off as he was painting the drive motors, and he never turned it back on. So all that sludge was building up in the clarifier overnight.

"We shut off the flow to that clarifier and operated temporarily on one clarifier. We had to get some portable pumps to pump out the sand filters and get some clear water flowing through. We eventually got everything back online without any sludge discharge to the stream. Everything was contained; we didn't miss a beat. The guys just knew what to do."

PART OF THE NETWORK

Of course there are times when even the best team of operators can use help from the outside. In such events, LaRocca can turn to colleagues around the state who are members of the IAWPCO.

LaRocca is just completing his year as president of the organization, part of a five-year commitment to serve in ascending positions on the executive board. He got involved with the association by attending meetings starting in the 1980s and served on the board for the group's northeast region.

"Being involved with the state association at the board level has been extremely beneficial to me, simply for the ability to network with fellow operators in different communities," LaRocca says. "It pays dividends when you encounter difficulties in your facility and you know that somewhere in the state, someone has already solved what you're dealing with. The answer is out there. That alone is worth the price of membership.

"We've received many ideas from other people throughout the state that have had a positive effect on our operation." In one case, the Devlin plant had a problem with filamentous bacteria in the activated sludge.

"One way to combat that is to dose your activated sludge with chlorine solution," LaRocca says. "But you have to get that dialed in, because if you feed too much chlorine, you kill off the good microbes. Through networking, we figured out how to calculate the pounds of chlorine we should be adding. It has worked very well for us."

SEEKING A SUCCESSOR

After 36 years, LaRocca looks toward eventually retiring with the facilities still in excellent hands. "One of my goals is succession planning," he says. "I want to make sure somebody in-house is ready to take my place. We've been working toward that over the last few years, training the people here who one day might take over for me.

"The industry has been good to me. I enjoy sharing my knowledge and experience with others. Helping people is a part of what I do and a part of the enjoyment I get from this profession." **tpo**

"Being involved with the state association at the board level has been extremely beneficial to me, simply for the ability to network with fellow operators in different communities."

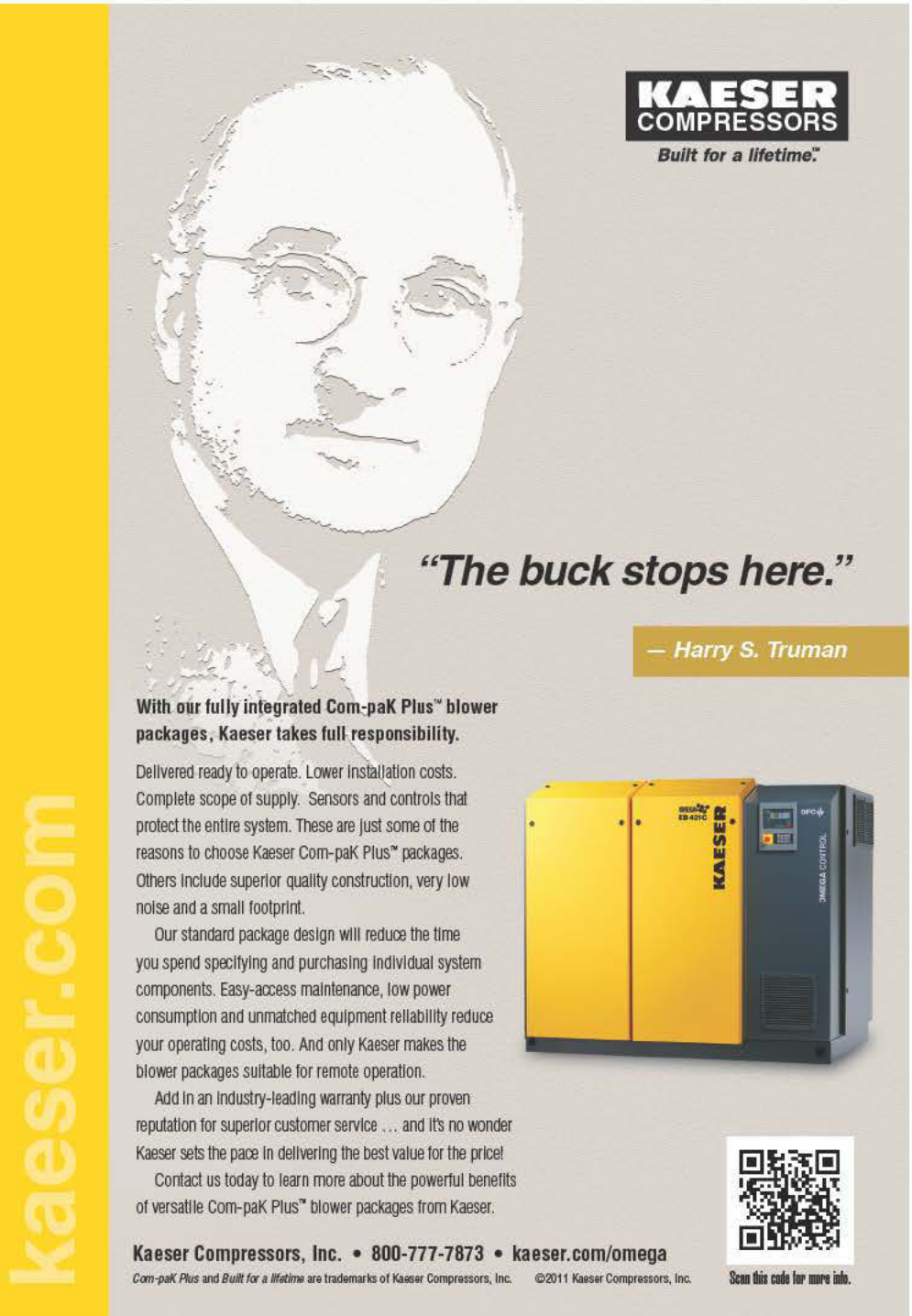
JOHN LAROCCA

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OPERATOR INVOLVEMENT IN A NEW PROCESS DESIGN AND IMPLEMENTATION PAYS PERFORMANCE DIVIDENDS FOR AN UPGRADED PLANT IN MERIDEN, CONN.

By Jim Force

IF YOU'RE FACED WITH RUNNING A SOPHISTICATED treatment plant, it helps if you have your operators involved in the design. That was the approach in Meriden, Conn., and it's paying off in staff morale, operating efficiencies, and effluent quality.

The 11.6 mgd (design) Meriden Water Pollution Control Facility uses a unique two-stage activated sludge process that provides a number of treatment options, including nitrification, denitrification, and chemical and biological phosphorus removal. It's supported by a 2,100-data-point SCADA system, complex enough to give most operators at least an occasional headache.

"We made sure our operators and maintenance people sat down with our

management team (director of Public Utilities Dave Lohman and superintendent of Water and Wastewater Operations Dennis Waz) and the engineers as the plant was being designed," says Frank Russo, plant manager and chief operator. "Things sometimes look good on paper, but plant people can make suggestions that result in easier maintenance and less cost when things are running."

In addition, Russo explains, the SCADA system programmers came to the plant to work side by side with his staff so that both groups could fully understand and contribute to the automation protocol of each phase as it was installed.



ABOVE: Meriden plant chief operator Frank Russo at the water storage area. LEFT: The Meriden team includes, from left, maintenance supervisor Rene Laliberte, assistant plant manager Michael Cerreta, chief operator Frank Russo, operators I Walter Lis, Dale Paul and Stephen Estrom, operator II Peter Stone, chemist Carmen Krzesik, and operator I Steven Belote. (Photography by Margaret Waage)

NEW SYSTEM, OLD SITE

While the upgraded Meriden treatment facility started up just over a year ago, it occupies a very old site. Parts of the collection system date back to the late 1800s, and a trickling filter went into operation in the 1960s. That was replaced with advanced secondary treatment around 1980. The new design, provided by AECOM, upgraded almost everything.

To begin with, there are two influent channels. Some 80 percent of the flow comes into the plant through a pumping station equipped with four 8,000 gpm Fairbanks Morse pumps with variable-frequency drives. The rest, from another portion of the collection system flows by gravity and enters directly through a separate sewer line into the headworks building. The configuration is more economical than adding more pump station capacity, says Russo.

In the preliminary treatment stage, new Huber RakeMax screens and a chain and screw-type grit removal process prepare the wastewater for pri-

profile



City of Meriden (Conn.) Water Pollution Control Facility

BUILT:	1960s, upgraded 1980s and 2010
POPULATION SERVED:	60,000
EMPLOYEES:	17
FLOWS:	11.6 mgd design, 10.8 mgd average
TREATMENT LEVEL:	Tertiary
TREATMENT PROCESS:	Advanced secondary
RECEIVING WATER:	Quinnipiac River
BIOSOLIDS:	Cake to incineration
ANNUAL BUDGET:	\$10.51 million (operations)
WEBSITE:	www.cityofmeriden.org
GPS COORDINATES:	Latitude: 41°30'48.02"N; Longitude: 72°49'42.50"W

mary treatment. Three primary clarifiers follow the grit chamber, and a splitter box controls the flow among them. Each clarifier is 85 feet in diameter with a 10-foot side water depth.

Primary effluent is routed to the first activated sludge treatment stage, consisting of four basins. The first-stage mixed liquor is then settled in four first-stage clarifiers before flowing to the second-stage activated sludge process, consisting of three aeration basins and a separate set of clarifiers.

For disinfection, Meriden uses chlorination-dechlorination with sodium hypochlorite and sodium bisulfite. From there, the effluent flows down a cascade re-aeration system into the Quinnipiac River and eventually to Long Island Sound.

"I can't be everywhere, but our operators are everywhere. They could see things as we went along with the upgrade, and they could question what we're doing and maybe suggest a better way."

FRANK RUSSO

Waste activated sludge from both stages is thickened on a Komline-Sanderson gravity belt thickener, mixed with primary sludge, and then dewatered on one of three tower belt filter presses supplied by Charter Machine Co. Depending on the blend of raw primary and thickened waste activated sludge, the resulting biosolids cake averages 20 to 26 percent solids. A tractor-trailer hauls it to an incinerator operated by Synagro.

UNIQUE SYSTEM

The two-stage activated sludge system is unusual, both in how it is configured and in how Russo and his team operate it. Both systems are designed with the flexibility to run the basins in parallel or series, although typically they operate in a series, or plug-flow mode. The first-stage tanks (each 56 feet wide, 100 feet long, and 18 feet deep) are segmented into anaerobic-anoxic-

COST-EFFECTIVE AERATION



Designers of the upgrade of the Meriden Water Pollution Control Facility had energy conservation in mind. New high-speed turbocompressor aerators (ABS) were installed to provide process air to each of the aeration basins. This, plus the upgrade to fine-bubble diffusers, provides excellent mixing and aeration, while saving on power.

Plant manager and chief operator Frank Russo explains that the aerators are not gear-driven — they use magnetic bearing technology and do not need oiling or some of the other maintenance procedures common on older, more conventional aeration blowers.

“These turbocompressors are frictionless and spin at a much higher rate than conventional machines,” he says. Where a conventional machine might operate at 1,800 to 3,600 rpm, the turbocompressors operate in the 30,000 rpm range. “Sensors record thousands of readings per second and keep the blower shaft suspended magnetically, without contacting any bearings as would be typical for most other blower technologies,” says Russo.

Russo says the Meriden units, able to deliver more than 10,000 cfm, are among the first of their size to be installed in the United States.

Frank Russo is pleased with the energy performance of the plant’s new aeration system (ABS turbocompressor).



Operator I Steven Belote collects samples at the biosolids belt press (Komline-Sanderson).

oxic zones with flexible internal mixed liquor recycle routing to achieve biological BOD, total nitrogen and total phosphorus removal.

The first stage removes about 60 percent of the nitrogen and also removes phosphorus biologically. The second stage provides anoxic denitrification polishing, using methanol, and includes a re-aeration zone in the final half of the last basin. Each stage has its own set of 105-foot-diameter, 14-foot-deep SWD clarifiers and its own return and wasting system.

“When they moved to advanced secondary treatment in the 1980s, the plant was designed and built as a two-stage system,” says Russo. “One stage was designed to remove ammonia and the second stage to remove BOD. They were operating the two trains as a single system, followed by clarification.” Now, the two-stage system provides much-needed flexibility. Russo explains that the first stage can be run in any of three modes:

- Completely aerobic for BOD and ammonia removal
- As a Modified Ludzack-Ettinger (MLE) process for BOD and partial nitrogen removal
- As an anaerobic-anoxic-oxic system (similar to the A2O process) for BOD, nitrogen, and phosphorus removal.

“Things sometimes look good on paper, but plant people can make suggestions that result in easier maintenance and less cost when things are running.”

FRANK RUSSO

The second stage typically serves as a nitrate polishing step but can also be configured for BOD and ammonia removal and can run in parallel with the first stage if additional aerobic treatment capacity is needed.

“With phosphorus limits coming down from the state in the near future, I expect we’ll operate the first stage as an anaerobic-anoxic-oxic system in the summer to meet the seasonal requirements of our anticipated phosphorus limits,” says Russo. “In winter we’ll run it in the MLE mode.”

The plant also includes a backup chemical system using iron salt addition for phosphorus removal upstream of both the primary and second-stage

clarifiers. In addition, the plant has capability for dosing ferric chloride into the belt filter press feed lines to aid in coagulation, assist with odor control, and drop out excess phosphorus from the filtrate before it drains back to the plant headworks.

The two stages also give Meriden additional flow routing flexibility to handle wet-weather flows. That’s an issue with the community’s aging sewer system, although 35,000 feet of sewer line were recently relined, and 1,600 vertical feet of manholes were repaired and sealed against inflow and infiltration.

AUTOMATION AND CONTROL

This kind of flexibility brings a level of complexity, and that is why Meriden has placed so much value on its SCADA installation. It’s a Honeywell Experion system, programmed and implemented by the control systems group of Siemens. “Our system monitors and controls some 2,100 points around the plant and in the pump stations,” says Russo. “It helps us to monitor, control and fine-tune the system on a daily basis.”

“It helps us to monitor, control and fine-tune the system on a daily basis.”

The instrumentation includes a pair of Hach LDO probes in each of the seven aeration basins, as well as a number of other analyzers, by Hach

and Endress+Hauser. These are located throughout the liquid train for ammonia, nitrate, TSS, ORP, PO₄ and pH. All the analyzers are tied back into the SCADA system, making it possible to review recent and historical trending data.

“All our aeration basins are controlled by our DO meters,” Russo explains. “This enables us to control DO in each individual basin. We can control both sides or halves of each basin and finely tune the system for optimum nitrogen and phosphorus removal.

“We use ORP to control the anaerobic environment in the first stage, and we control methanol dosing in the second stage based on our ORP values.



Frank Russo and his team were heavily involved in the design of the plant upgrade completed in 2010.

Part of our flexibility is that we also have the ability to control methanol dosing from either the influent or effluent nitrate analyzers in the second stage via a PID loop. We know when we're achieving maximum nitrate or phosphorus removal." The values reported by the various analyzers can also be used to control chlorine dosage.

GOOD PERFORMANCE

Meriden generally runs the first set of aeration basins with a mixed liquor suspended solids (MLSS) of around 3,500 to 4,000 mg/l. In the second series of aeration basins, a thinner MLSS level is maintained — around 1,500 to 1,800 mg/l. "In the second stage, all the bugs have to do is consume methanol and reduce nitrate," says Russo. "So we don't have to waste as much. Our solids retention time can be as much as 50 days, whereas we generally run at 17 days retention time in our first stage."

The new system has been working very well. "We've had the denitrification systems online for over a year now, and we've seen effluent total nitrogen below 1 mg/l during the summer and low-flow periods," says Russo. In recent months, effluent BOD has been around 3 mg/l, and suspended solids have ranged from non-detect to 4 mg/l.

After the biological phosphorus removal system had been online for about four months, Russo and his staff were still fine-tuning it. "During the past summer, we recorded total phosphorus between 0.3 and 0.6 mg/l, with a few days as low as 0.26 mg/l," Russo says.

(continued)

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From left, operator II Peter Stone, maintenance supervisor Rene Laliberte and chief operator Frank Russo.

Meriden's SCADA system also controls the truck loading rates in the bio-solids building, an arrangement Russo says works very well. "Our hauler lets us know how much weight a given trailer can hold," he reports. "We then enter that number into our SCADA system, and when the scale the trailer sits on reaches our target weight, the system sounds an alarm and automatically initiates a controlled shutdown of our belt filter presses.

"We get maximum loads — about two trailer loads a day, four days a week — helping to control our solids-handling budget, and our hauler never has to worry about overweight loads."

HANDS-ON

Russo attributes much of the new system's success to education and the involvement of the operations and maintenance staffs in the design of the plant and in the implementation of new technology. "One of the most valuable lessons we've learned is to listen to your operators and maintenance people in the field," Russo says. "I can't be everywhere, but our operators are everywhere. They could see things as we went along with the upgrade, and

Meriden Water Pollution Control Facility PERMIT AND PERFORMANCE (monthly averages)

	INFLUENT	EFFLUENT	PERMIT
BOD	163 mg/l	5.0 mg/l	30 mg/l
TSS	164 mg/l	7.6 mg/l	30 mg/l
Total nitrogen	24 mg/l	3.1 mg/l	5.1 mg/l
Phosphorus	3.4 mg/l	0.6 mg/l	Monitor only

Notes: Phosphorus data is average since startup of Bio-P system in June 2011. General permit allows for 493 lbs/day in 2011; equates to 5.1 mg/l at the plant's 11.6 mgd design flow.

they could question what we're doing and maybe suggest a better way."

Besides Russo, Waz and Lohman, the plant team includes assistant manager Mike Cerreta; maintenance foreman Rene Laliberte; chemist Carmen Krzesik; lab technician Mike Komarenko; electronics technician Jon Yoder; maintenance mechanic Peter Villa; operator II Peter Stone; operators I Dale Paul, Jay Nedza, Walter Liss, Steve Estrom, Steve Belote and Todd Wollenberg; and administrative secretary Debra Hazen.

Russo offers an example of staff ingenuity involving the positioning of the two new JWC Muffin Monster grinders in the screenings building. "The original layout looked good on paper, but our operators suggested we install the machines in opposite directions to each other so that they would have better access to the units for maintenance," says Russo. "We don't have to unbolt the machines from the floor. Their suggestion has saved us many, many hours in maintenance time."

Likewise, the plant staff was closely involved with the SCADA system installation. "We put small parts of the system online, one at a time," Russo says. "Once our operators got used to each part, we moved on to the next and trained them further."

Russo says the programmers came in for as long as a week at a time, providing training in the SCADA system for all the operators. Then they followed up with one-on-one training. It's still a learning process, but the sequential approach has been extremely helpful. "We get information from everybody," he says. "It really helps us make our plant operator-friendly." **tpo**

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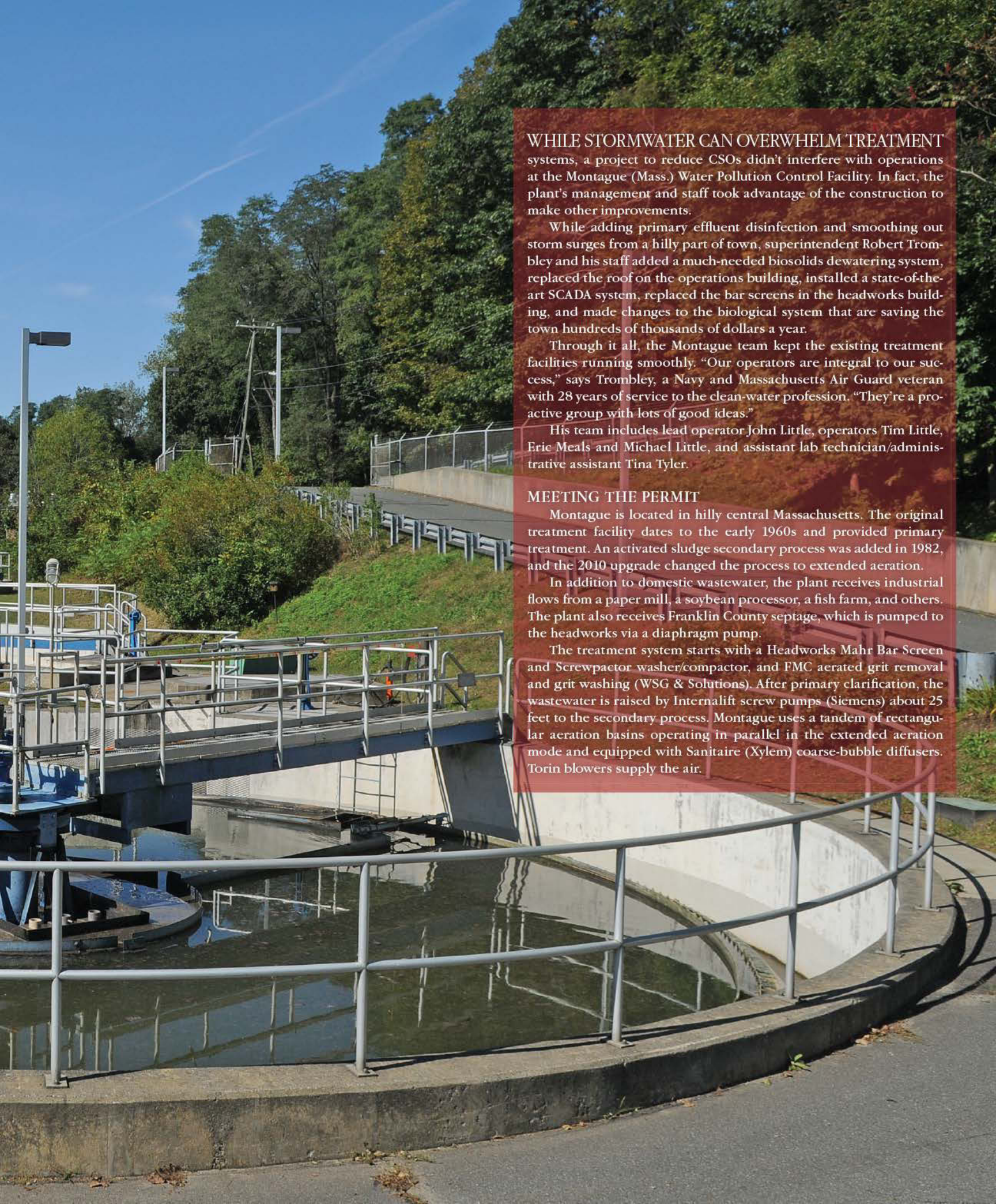
A MASSACHUSETTS PLANT ACTS VOLUNTARILY
TO IMPROVE HANDLING OF CSOs WHILE MAKING OTHER
MAJOR CHANGES TO ENHANCE TREATMENT PERFORMANCE

By Jim Force

Overflow *Control*

The secondary aeration tanks at the
Montague Water Pollution Control Facility.
(Photography by Brian McDermott)





WHILE STORMWATER CAN OVERWHELM TREATMENT systems, a project to reduce CSOs didn't interfere with operations at the Montague (Mass.) Water Pollution Control Facility. In fact, the plant's management and staff took advantage of the construction to make other improvements.

While adding primary effluent disinfection and smoothing out storm surges from a hilly part of town, superintendent Robert Trombley and his staff added a much-needed biosolids dewatering system, replaced the roof on the operations building, installed a state-of-the-art SCADA system, replaced the bar screens in the headworks building, and made changes to the biological system that are saving the town hundreds of thousands of dollars a year.

Through it all, the Montague team kept the existing treatment facilities running smoothly. "Our operators are integral to our success," says Trombley, a Navy and Massachusetts Air Guard veteran with 28 years of service to the clean-water profession. "They're a proactive group with lots of good ideas."

His team includes lead operator John Little, operators Tim Little, Eric Meals and Michael Little, and assistant lab technician/administrative assistant Tina Tyler.

MEETING THE PERMIT

Montague is located in hilly central Massachusetts. The original treatment facility dates to the early 1960s and provided primary treatment. An activated sludge secondary process was added in 1982, and the 2010 upgrade changed the process to extended aeration.

In addition to domestic wastewater, the plant receives industrial flows from a paper mill, a soybean processor, a fish farm, and others. The plant also receives Franklin County septage, which is pumped to the headworks via a diaphragm pump.

The treatment system starts with a Headworks Mahr Bar Screen and Screwactor washer/compactor, and FMC aerated grit removal and grit washing (WSG & Solutions). After primary clarification, the wastewater is raised by Internalift screw pumps (Siemens) about 25 feet to the secondary process. Montague uses a tandem of rectangular aeration basins operating in parallel in the extended aeration mode and equipped with Sanitaire (Xylem) coarse-bubble diffusers. Torin blowers supply the air.



Plant superintendent Robert Trombley and his team added effective CSO treatment and made other improvements at the Montague facility.

“Our sludge blankets have increased to two to three times the normal thickness. And we’re holding as much as 35,000 pounds of solids in the system, where before our sludge inventory was between 6,000 and 8,000 pounds.”

ROBERT TROMBLEY

Treated water settles in two circular clarifiers powered by Falk (Rexnord) drives. Then the effluent is disinfected in a chlorination system (Fischer Porter, now Severn Trent) and discharged to the Connecticut River just downstream from its confluence with the Deerfield River. Chlorination is required April through October.

Trombley and his team have a portable BioTriad odor-control unit available for masking odors at various points around the plant

profile



Town of Montague (Mass.) Water Pollution Control Facility

BUILT:	1962 (upgrades 1982 and 2010)
POPULATION SERVED:	7,200
TREATMENT LEVEL:	Secondary treatment
FLOWS:	1.83 mgd design, 1 mgd average
TREATMENT PROCESS:	Extended aeration
RECEIVING STREAM:	Connecticut River
BIOSOLIDS:	Composting by private contractor
AWARDS:	2011 Excellence Award, New England WEA
ANNUAL BUDGET:	\$1.16 million (operations)
WEBSITE:	www.montague.net
GPS COORDINATES:	Latitude: 42°34'49.84"N; Longitude: 72°34'20.93"W

if necessary. A GE iFIX SCADA system controls the new CSO treatment system and soon will be expanded to full plant coverage.

Biosolids wasted from the system pass to a storage tank and gravity thickener and then are mixed with polymer in a system powered by variable-frequency drive motors and mixers. On a new Fournier rotary press, the material dewateres to a cake averaging 30 to 45 percent solids. It is stored in a 40-cubic-yard container, and New England Organics hauls it to its Hawk Ridge composting center in Maine.

The plant meets a 30/30 permit for BOD and TSS with plenty of room to spare, and tracks nitrogen, although it does not have a nitrogen limit.

HANDLING CSOs

A challenge tougher than meeting the permit comes from the local topography and the combined sewers in an older section of town. These conditions contributed to frequent stormwater overflows into the Connecticut River. The plant staff stepped up voluntarily to correct the situation.

The \$6.7 million CSO project, funded through sources including the state revolving loan fund, the state’s Tribal Assistance Grant Program, and the U.S. Department of Agriculture, involved major changes at the treatment plant and throughout the sewer system. During construction and startup of the new facilities, the plant continued to meet its permit and effectively serve the town’s 7,200 citizens.

To better manage sewer flow, the project modified three regulators by raising the weir height to control the volume passing through to the plant. Downstream of the portion of the system where combined sewers still exist, an 800-foot-long, 4-foot-diameter buffer line was installed to slow down storm flow before it passes to the treatment plant.

“During wet weather, as much as 45 percent of our flow might be stormwater,” Trombley says. The plant is rated for 1.83 mgd and sees average daily flows of 1 mgd. Peak flow capacity is 4.86 mgd. With the changes to the CSO regulators, more flow now comes to the plant, and less is discharged to the Connecticut River.

To reduce the risk of secondary treatment system washout, the plant is equipped with a chlorinated bypass system after primary

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treatment. The shortcut is activated when storm events push the hydraulic flow above 4 mgd. To improve removal of rags and debris, a new automatic bar screen replaced the previous manually operated unit.

Finally, the CSO reduction project called for a SCADA control system. The system has automated the overflow treatment process, and plans are to extend it to monitoring and control of the entire treatment plant in the future.

WORK-AROUNDS AND IMPROVEMENTS

How did Montague manage the project while continuing to treat wastewater? "Very carefully," says Trombley. He credits his operators with managing the changes. "They stayed in contact with the contractors in the field on a daily basis," he says. "They made sure the project didn't interfere with our normal operations."

The new heavy-duty automated bar screen was critical because, as the influent line was cleaned out, the plant had to deal with a freer flow and more debris and grit that used to simply accumulate in the line. To accommodate the improvement, Trombley's team continued to operate the old manual bar screen during construction.

Solids handling was affected as well. The Montague plant lies on a long, narrow strip of land between a highway and the river, and the construction crowded the normal flow scheme. That, plus the need to sandblast and reseal the sludge storage tanks, forced the plant to route liquid biosolids around the sludge handling facilities, directly to 9,000-gallon tanker trucks that hauled the material away.

A spare storage tank came in handy as a way to store influent and equalize flow through the existing treatment system as the construction proceeded.



Robert Trombley checks data on the supervisory control and data acquisition (SCADA) system in the main office (GE iFIX).

SMART FINANCING

A thoughtful approach to financing enabled the plant to accomplish other improvements during the CSO reduction project. "We couldn't have received funding for these improvements, but CSO reduction is sort of the hot item of the day," says Trombley. "As we applied for funding for that project, we included requests for a number of other things we needed."

The upgrades included a new roof on the operations building,



The Montague team includes, from left, operators Michael Little and Tim Little, plant superintendent Robert Trombley, operator Eric Meals, administrative assistant and assistant lab technician Tina Tyler and lead operator John Little.

“Our operators are integral to our success. They’re a proactive group with lots of good ideas.”

ROBERT TROMBLEY

the new bar screen, and — probably the most important addition — the rotary press for biosolids dewatering. “That alone added nearly \$1 million to the project,” Trombley observes.

The project also brought significant changes to the secondary treatment system, saving the town at least \$200,000 a year in operating costs. Lead operator John Little explains that after experimenting with the activated sludge system, the plant settled on alternately running one of the two basins in the aeration mode while shutting off the air in the other.

“We changed the whole process in order to meet budget constraints,” he says. In the new arrangement, operators run the air into just one basin for two to three hours and put the return activated sludge (RAS) into the other basin, where the air is turned off. “We run the RAS down to the mixing box and feed it through four entry points,” says Little. “That provides more carbon source for denitrification.

“When the oxidation reduction potential (ORP) gets into the hundreds, we switch and shut off the air in the other basin. It’s like a sequencing batch reactor (SBR), except we don’t have an SBR.” Automatic timers turn the airflow on and off.

CUTTING NUTRIENTS

The operational changes have reduced effluent nitrogen, ammonia and phosphorus. BOD and TSS are so low they are sometimes hard to measure. In turn, chlorine usage has dropped. “We used to receive three or four 2,000-pound cylinders each year,” says Little. “Now we’re down to less than two.”

Power consumption has also been reduced. “For years we ran the blowers at 100 horsepower,” Little explains. “Now we can run at only 50 hp.” Even more savings result from holding more solids in the system. “Our sludge blankets have increased to two to three times the normal thickness,” says Trombley. “And we’re holding as much as 35,000 pounds of solids in the system, where before our sludge inventory was between 6,000 and 8,000 pounds.” That means fewer solids out of the plant and a reduction in dewatering and cake hauling costs.

“In the old days, our liquid sludge was trucked out and incinerated,” says Trombley. “We’d see eight to 12 truckloads a week, and maybe spend \$375,000 a year for solids management. It’s much less now.”

AMBITIOUS GOALS

In another innovation, Montague returns waste activated sludge to the head of the plant, where it is allowed to co-settle with primary solids. The result is increased cake solids content.

All in all, Montague has met the ambitious goals it set at the

IT'S ALL ABOUT COMMUNICATION

It's no secret that good communication is a key to successful wastewater treatment. But in Montague, Mass., communication among staff members — and with a local paper mill that provides a substantial share of the plant load — is paramount.

"Communication is huge," says plant superintendent Robert Trombley. "It is vital to the flow, to our work." Trombley lets the staff do its work: "They're hands-on. I listen to them. They're the ones most familiar with the problems and what to do to correct them."

The philosophy is to share ideas and not worry about perfection. A dry erasable white board is always full of suggestions and observations. The conversation during the morning break and at lunch often turns to problem-solving. "We want all oars in the water — everybody on the same page," says Trombley. "Plus, we know mistakes are going to be made. We talk about the risks of things we do. Some things aren't going to work." But he trusts his staff, and they feel more comfortable making decisions.

The reliance on communication extends to the local paper mill. Changes in the mill's product mix or production techniques directly affect the quality of its wastewater, so the plant team keeps a line open to mill management, talking with them by phone every day about the line and grade of paper they are running.

"One of our guys used to work in the mill, and we've had the mill operators down to the treatment plant for a tour," Trombley says. "That gives each of us a much better understanding of the other's processes."

Senior operator John Little says the open, honest environment makes it fun to come to work. "We have a good close-knit group here," he says. "Everybody knows how to run the lab. Anyone can step in and do another's job at any point. We depend on each other for help. We enter team events in town, put up holiday lights. We have a blast."



WATCH THEM IN ACTION

To learn more about the Montague (Mass.) Water Pollution Control Facility, view the video at www.tpomag.com.



LEFT: A bumper sticker on the front door of the Montague Water Pollution Control Facility office. ABOVE: Assistant lab technician Tina Tyler runs tests that help the plant stay on track.

"Experts said we couldn't do this. It's not by the book. They said we were crazy, but it's working. It's just amazing."

JOHN LITTLE

outset of the project. "We're achieving our CSO reduction targets, even though we've never had so much flow through the plant," says Trombley. "Our main goals are to prevent overflow of untreated water to the river, and to protect our secondary system from solids blowout. We're at the mercy of Mother Nature." He's proud that the remodeled plant can handle the variations in storm intensity and duration.

Little expresses a degree of amazement when he thinks about what the team has accomplished in the last few years. "Experts said we couldn't do this," he says. "It's not by the book. They said we were crazy, but it's working. It's just amazing." **tpo**

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Keeping Watch

AN INTEGRATED SOFTWARE PROGRAM HELPS THE DES MOINES REGIONAL WASTEWATER RECLAMATION FACILITY FIND SAVINGS OPPORTUNITIES AND EXTEND EQUIPMENT LIFE

By Doug Day

It is said that problems demand solutions. The corollary to that old rule is that solutions demand information; the deeper the understanding, the better the solution.

The staff at the regional Wastewater Reclamation Facility run by the City of Des Moines, Iowa, now has extensive knowledge of the plant's energy and maintenance needs through innovative software. The program is tied to the SCADA system to show where energy is being used and identify ways to optimize equipment.

The Enterprise EAM Asset Sustainability Edition (EAM-ASE) is from the Infor business software company. Des Moines received an \$83,225 federal stimulus fund grant from the Iowa Office of Energy Independence to integrate the program with its Rockwell SCADA,

“The ability to view and manage the total operating condition, including energy usage, operating costs, and maintenance costs, allows us to optimize the use of these high-cost assets, minimize the impact on the plant, the environment and the public, and extend the life of our equipment.”

BILL MILLER

Hach water information system, and ControlLogix PLCs (Rockwell Automation).

It monitors the performance of motors, pumps, and blowers and tracks energy use parameters to aid in cutting energy consumption at the plant.

REAL-TIME DATA

“It enables us to monitor in real time the key operating parameters and health statistics for the plant's major pieces of equipment,” says Bill Miller, who headed up the project for the plant's Facilities Management group. “The ability to view and manage the total operating condition, including energy usage, operating costs, and maintenance costs, allows us to optimize the use of these high-cost assets, minimize the impact on the plant, the environment and the public, and extend the life of our equipment.”

The software project, which went online on January 1, 2011, received the 2010 Governor's Special Recognition in Energy Efficiency/Renewable Energy Award. The 200 mgd (design) facility serves 16 communities and sewer districts in the Des Moines Metropolitan Wastewater Reclamation Authority with a population of more than 560,000.

With the help of Stratum Consulting Partners, the plant team used the software to create a monitoring and maintenance program for its largest energy users, including four 2,000 hp aeration blowers, six 700 hp pumps, and nine 100 hp sludge return pumps. Projections showed an estimated savings of \$41,500 a year in energy, maintenance and repair costs, and a reduction of CO₂ emissions of about 1.5 million pounds.

Within six months of implementation, the actual energy reduction was about 100,000 kWh, and the annualized savings of about \$200,000 were more than four times the original projections. Because of its success at the Wastewater Reclamation Facility, the city's water works staff has decided to use the software as well.



Bill Miller

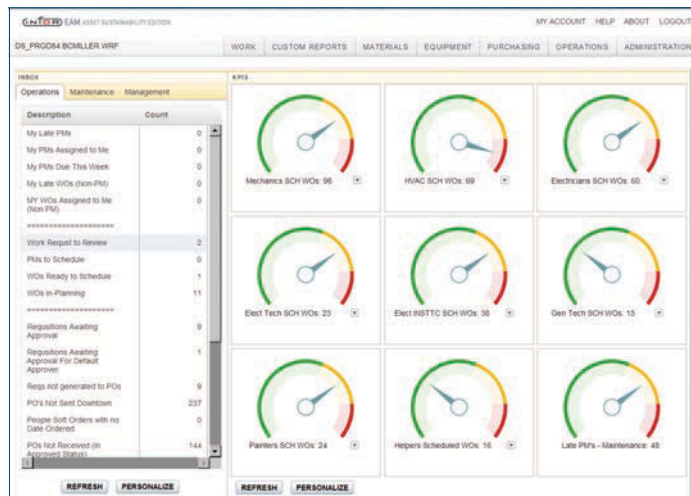
PHOTOS COURTESY OF DES MOINES METROPOLITAN WASTEWATER RECLAMATION AUTHORITY

Des Moines Wastewater Reclamation Facility Energy Savings Opportunities					
PROCESS AIR BLOWERS		RAW WATER PUMPS		RETURN SLUDGE PUMPS	
High Cost/Hr	\$47.69	High Cost/Hr	\$17.97	High Cost/Hr	\$0.82
Low Cost/Hr	\$31.40	Low Cost/Hr	\$11.67	Low Cost/Hr	\$0.63
Cost/Hr Delta	\$16.29	Cost/Hr Delta	\$6.30	Cost/Hr Delta	\$0.19
Potential Savings	\$43,210.08	Potential Savings	\$16,783.20	Potential Savings	\$506.16
Annual Savings	\$142,087.20	Annual Savings	\$55,188.00	Annual Savings	\$1,664.40

What's Your Story?

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

The EAM-ASE dashboard (Infor) provides a quick overview of many parameters and helps facility staff save energy and optimize operations and maintenance.



RELIABILITY-CENTERED MAINTENANCE

The information gathered by the EAM-ASE software doesn't only help reduce energy use. It also helps the plant staff track equipment performance to improve reliability and prevent breakdowns.

For instance, the system sends an automatic email or work request if a pump, engine or other asset operates outside its set parameters. Tracking such information helps the Asset Reliability Team fix equipment on a planned basis before it fails.

The information also helps identify equipment that is under-performing or is deteriorating in performance. "We worked with Stratum to design a customized best practices model for maintenance," says Bill Miller of the plant's Facilities Management group. "By focusing on materials, purchasing and work management, we developed structured, disciplined processes to manage our workflow and increase preventive maintenance, improve asset performance, and reduce maintenance costs.

"It ties together all the information from inspections, work orders, and equipment life cycle reports. I can run an annual report, hand it to Engineering and say, 'Here's what you have to do this year and next year. And by the way, here's what has to be replaced five years from now.' It's like an automatic capital improvement plan."

RANKING EQUIPMENT

The data from the new system also helps the operators know which equipment is most efficient, and that helps them decide which pieces to use first. Some of the 2,000 hp blowers, for instance, are more efficient than others, so operators use them as the primary blowers.

Two SCADA programmers from the Des Moines wastewater utility worked with two from Rockwell International and another from Stratum to integrate the EAM-ASE and create the trending and reporting tools.



ABOVE: Cogeneration accounts for up to 40 percent of the energy needs of the Wastewater Reclamation Facility in Des Moines. Capacity will increase to more than 50 percent when more engine-generators are added in the near future. LEFT: This main raw water pump is one of six 700 hp pumps at the plant being monitored for energy use.

Miller is now planning phase two of the project, adding about 10 percent of

the 70 pump stations to the EAM-ASE system along with more pumps, the buildings' HVAC system, and large compressor systems. All of the equipment for a new 300 mgd headworks, to be added in about three years, will also be included.

Miller is also looking for a way to expand use of the software to the plant's cogeneration facility, which generates 1.8 MW, or 35 to 40 percent of the facility's electrical demand, and recovers heat and exhaust gas from its three 600 kW Cummins engine-generators to heat digesters and some buildings.

Two 1.4 MW GE Jenbacher 12-cylinder generating units will soon be added to the cogeneration system, and two others will be added as backup generators. That will increase the amount of self-generated power to more than half of total demand.

DOWN WITH CARBON

"It will further reduce the plant's carbon footprint and expand the use of renewable fuel from biogas," Miller says. Other energy projects have included advanced energy-efficient control systems, marketing of biogas to neighboring industries, optimizing the 2,000 hp process air blowers, and the addition of energy-efficient lighting.

Miller's expertise and passion center on managing assets over their life cycles to make things as efficient and predictable as possible. He admits it sometimes takes a change in mindset to embrace such efforts, but when data is managed and presented in ways that are usable and understandable, it makes the mundane valuable. **tpo**

Repair or Rethink?

A WEST VIRGINIA TREATMENT PLANT DECIDES AGAINST A BLOWER REPAIR AND INSTEAD INSTALLS A NEW AERATION SYSTEM THAT CORRECTS A PIN FLOC PROBLEM AND SAVES SIGNIFICANT ENERGY

By Calvin Wallace

When the Moundsville (W.Va.) Wastewater Treatment Plant experienced a blower failure, the staff naturally assumed they should repair the failed unit to keep the system design intact. At the time, two 75 hp centrifugal blowers fed air to the plant's four aeration tanks, and a third centrifugal blower unit served as a backup.

However, plant personnel decided to place the repair on hold pending an evaluation of tank conditions. The 2.43 mgd (design) activated sludge plant had been experiencing an issue with pin floc in the aeration tanks, indicating a problem with dissolved oxygen (DO) levels.

In the end, rather than simply repair or replace the old blower, the team installed a new aeration system using a blower and variable-frequency drive in a feedback loop with a DO sensor. The arrangement quickly solved the pin floc problem and saved substantial energy.



The Moundsville team includes, from left, collection system operator Harry Logsdon, superintendent Larry Bonar, operator/collection crew member Jordon Wood, assistant superintendent Tim Minor, operator/collection crew member Chuck Wood, operators Mike Hill and Tony Curto, and lab manager Duane Campbell. Not pictured: operator Cole Simms.



The dissolved oxygen sensor (Danfoss) on the end of the boom supports plant automation by providing the data needed to fine-tune process airflow for changing conditions.

STUDIES FIRST

Moundsville, a city of 10,000 along the Ohio River, is home to sites like Prabhupada's Palace of Gold and the retired West Virginia State Penitentiary. The treatment plant serves the city, areas outside the city limits, and Glen Dale, W.Va., a neighboring community of 2,500. The facility had a solid compliance record leading up to the blower failure.

After a study with an online DO meter, plant operators determined that DO levels varied from about 0.5 to 6.0 ppm in a typical day. The low levels indicated that microorganisms were dying in anaerobic zones at times, while at other times the DO levels were excessive, which meant wasted energy.

With that data in hand, the team back-calculated the air requirements for the individual aeration tanks. The results supported a new solution: installing an inline DO meter and variable-frequency drive controlling a 100 hp positive displacement (PD) blower connected to the primary aeration tanks. The solution also called for a valve in the line to the secondary aeration tanks and adding a 50 hp rotary positive displacement blower.

The air system was carefully designed to respond to real-time conditions in the aeration tanks. The DO sensor would constantly monitor oxygen levels and output a control signal varying from 4 to 20 mA. The signal then would be sent to the variable-frequency drive, which controls the blower speed by changing the frequency of the motor power supply.

QUICK RESULTS

Stu Harper of S. R. Harper, a Danfoss representative, recommended installing a Danfoss variable-frequency drive and Danfoss DO sensors, as well as a Kaeser Com-paK Plus EB290C 50 hp blower and a Kaeser Omega-paK FB620 100 hp blower with a maximum combined flow of 2,585 cfm. Harper chose the blowers for their wide turndown range, surge-free characteristics, and power almost directly proportional to speed in constant pressure applications like tank aeration.

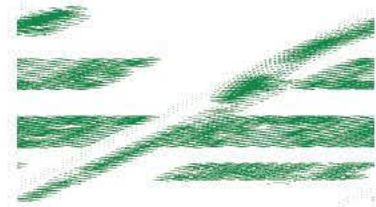
"We installed the equipment ourselves and saved quite a bit of money," says plant superintendent Larry Bonar. The staff programmed the drive to maintain a DO level of 2.2 ppm and a minimum 40 percent of blower speed. After four days of automatically controlled DO levels, the pin floc issue disappeared. In addition, the

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"All the system requires is routine maintenance. The repair enabled us to save \$50,000 to \$60,000 per year in energy costs, and helped to reduce solids in our effluent by letting us control the amount of dissolved oxygen in the tanks."

LARRY BONAR

blower/drive combination operated at high efficiency and did not produce excess air. In just the first year, the plant saved about \$24,000 in electricity.

Plant personnel went on to perform DO studies in the two remaining primary aeration tanks and again discovered excessive air levels. This time, they installed a second Kaeser 100 hp PD blower with a Danfoss variable-frequency drive and DO sensor to control airflow to the tanks. The two existing centrifugal blowers were still in working condition and did not go to waste — they were incorporated into the system as backups to provide full redundancy.

"All the system requires is routine maintenance," says Bonar. "The repair enabled us to save \$50,000 to \$60,000 per year in energy costs, and helped to reduce solids in our effluent by letting us control the amount of dissolved oxygen in the tanks."


ABOUT THE AUTHOR

Calvin Wallace is national sales manager for Omega blowers with Kaeser Compressors in Fredericksburg, Va. tpo

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The 1,200-square-foot green roof is planted with drought-resistant grass and ground cover. Gutters and downspouts were plumbed to drain into a newly buried 2,500-gallon fiberglass tank, which also receives runoff captured in the green roof's membrane.

Green Innovations

A STATE GRANT HELPS A NEW YORK TOWN PAY FOR A GREEN ROOF, A SOLAR PHOTOVOLTAIC SYSTEM, AND VARIOUS ENERGY EFFICIENCY PROJECTS

By Jeff Smith

Persistence and patience are bringing a payback to an upstate New York wastewater treatment plant, and facility officials say there could be even more to come. In 2007 the Town of Williamson began applying for grants to help ease the financial pain of upgrades to its 625,000 gpd contact stabilization treatment plant. But whether the sources were local, state or federal sources, the rejection notices kept coming.

"It just seemed our sewer rates were too low for us to attract and qualify for any available maintenance-related funding," says chief operator John Manahan. "But I'm a real proponent of green energy, so when I was approached in early 2009 by a local consulting firm to apply for federal stimulus funds tagged for green innovation, I was all for it."

"I'm a real proponent of green energy, so when I was approached in early 2009 by a local consulting firm to apply for federal stimulus funds tagged for green innovation, I was all for it."

JOHN MANAHAN

About six months later the town received a \$700,000 grant through the State of New York Environmental Facilities Corporation to integrate a variety of improvements that would improve energy efficiency, create renewable energy, and manage stormwater runoff with green infrastructure.

Awarded under the Green Innovation Grant Program, the money paid for improvements in rainwater harvesting, an array of solar units, energy-efficient lighting, a high-efficiency boiler, and pipeline leak detection equipment. It even paid for a green roof to replace a leaking roof on the main process building.

"We didn't get any funds for maintenance items like painting or repair of the process tanks, but we were awarded the innovative part, and that has helped us a lot," says Manahan.

The 1,200-square-foot green roof solved a big problem for the plant, because the town was trying to get budget approval for hot-tarring only one portion of the two-tier roof to eliminate the leaking. But instead the roof was converted to green and serves as a demonstration green roof for the Williamson area.

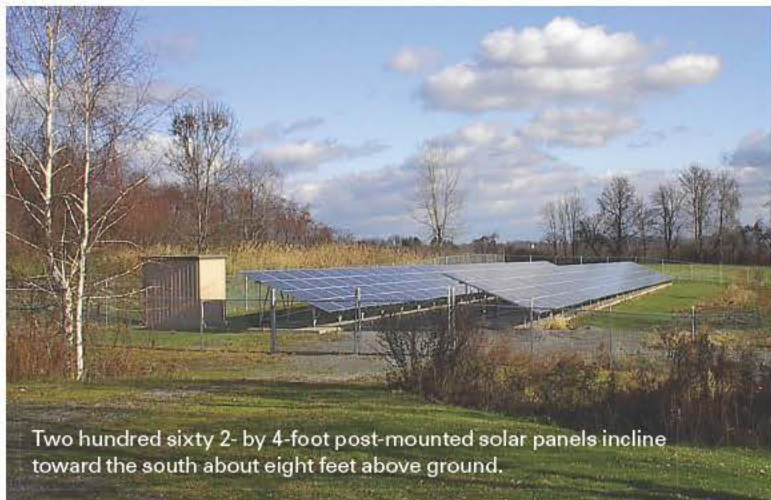
The green roof is planted with drought-resistant grass and ground cover and is only part of an overall water efficiency effort. Gutters and downspouts were plumbed to drain into a newly buried 2,500-gallon fiberglass tank, which also receives runoff captured in the green roof's membrane. A pump delivers water from the tank to two hose bibs for use by operators to clean process tanks and to wash trucks and other equipment.

In-kind work by plant operators contributed 10 percent to the value of the grant and consisted mainly of excavation. Many underground cables had to be relocated, and since Manahan and assistant operator Joseph English knew their location, it made sense for them to rent the equipment and do the work themselves. They also did landscaping, which included reseeding the excavation for the buried tank and replanting some small shrubs.

But the most obvious change to the landscape came from a 60 kW solar photovoltaic array that produces 80,000 kWh and saves more than \$8,000

Share Your Ideas

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Two hundred sixty 2- by 4-foot post-mounted solar panels incline toward the south about eight feet above ground.

each year. Located near the plant entrance and highly visible to passers-by are 260 of the 2- by 4-foot post-mounted solar panels, which incline toward the south about eight feet above ground. The only maintenance required is keeping them clear of snow, which accumulates only during 3- to 4-inch snowfalls. Lighter snowfalls melt and heavier snowfalls slide off the panels.

The solar array draws many visitors to the plant, as does the green roof. The plant also saves energy from a change to more efficient lighting and the addition of motion detectors to control interior and exterior lights.

Manahan says the plant's energy and water conservation improvements are part of the community's long-term sustainability plan. The success of the solar installation at the treatment plant influenced town leaders' decision to add one at the town hall, as well. "We are now looking at adding a windmill generator to supplement our solar energy," Manahan says. "That will really change our landscape." **tpo**

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FOGged In

A PROBLEM WITH FOAMING CAUSED BY *NOCARDIA* FUNGI IS TRACED TO FATS, OILS AND GREASE AND REMEDIED BY A SERIES OF PROCESS ADJUSTMENTS

By Ron Trygar, CET

Wastewater operators face fog in two distinct ways. They might have to drive through thick banks of fog on their way to work only to face FOG (fats, oils and grease) again at the treatment plant.

Once the Lab Detective made it through dense fog to the treatment facility, he found the operators working alongside the collection system crew members, who were running a vacuum truck, normally used to clean sewer lines. They had the suction piping extended to its highest elevation and the flexible hose up over the wall of the aeration tank.

COLLECTING DATA

Joe, the chief plant operator, described the work being performed and the viscous foam that was covering the aeration basin and entering the clarifiers (Figure 1). The foam had formed a thick scum on the clarifiers, covering the entire surface and flowing into the scum boxes, which pumped to the aerobic digesters.

The foam was also exiting the treatment plant in the effluent, cre-

Foam trapping is an issue in many plants that have compartmentalized tanks with submerged inlets and outlets. When foam gets trapped in treatment tanks, it can re-seed itself when conditions are right.



FIGURE 2 – *Nocardia* was identified as the culprit causing the foam. *Nocardia* is one of several fungi that cause foaming in activated sludge facilities. It is relatively easy to identify, since it is a short, truly branched filament that is gram positive and mostly Neisser negative.

ating a large chlorine demand and elevated effluent TSS values. Joe had asked the detective to come to the treatment facility to help troubleshoot the problems and come up with a plan to rid the plant of the excessive scum and foam.

The detective collected data about the plant, including lab results, O&M manuals and process control data, and also interviewed the plant operators. The facility was a 5.0 mgd (design) conventional activated sludge plant with three aeration tanks of about 1.7 million gallons each and four secondary clarifiers.

The plant influent flow was just below half the permitted capacity, there were no primary clarifiers, and the facility discharged to surface water, requiring effluent



FIGURE 1 – Viscous foam formed a thick scum on the clarifiers, covering the entire surface and flowing into the scum boxes, which pumped to the aerobic digesters.

chlorination and dechlorination. There were three shifts with two plant operators per shift, along with five maintenance mechanics and two utility workers.

UNDER THE MICROSCOPE

The detective performed a microscopic exam of the foam and the mixed liquor suspended solids (MLSS), and the results indicated *Nocardia* as the culprit causing the foam. *Nocardia* is one of several fungi that cause foaming in activated sludge facilities. It is relatively easy to identify, since it is a short, truly branched filament that is gram positive and mostly neisser negative (Figure 2).

It is hydrophobic (doesn't like water) and loves oil and grease as a food source. *Nocardia amarae* and similar actinomycete are found in soil, water, and the human digestive tract. Other foaming bacteria include Type 1851, *Microbrix parvicella* and Type 0092. Some *Nocardia* species are pathogenic, causing tuberculosis-like symptoms. Caution should be taken when working around the aerosol generated by aeration equipment when *Nocardia* is present.

Nocardia and nocardioform fungi (now reclassified as *Gordona*) are commonly found in activated sludge mixed liquor when there is an abundance of FOG in the influent, when the water is warm, and at older sludge ages.

Joe's treatment plant fit this description well: the influent temperature was about 25 degrees C, the facility was run at a 17-day sludge retention time (SRT), and there were many restaurants in town with minimal grease traps, if any at all. There was no enforcement of local ordinances that prohibit dumping waste grease and oil down the drains.

PLAN OF ATTACK

There are many opinions on how to get rid of scum and foam, and Joe's operators had been trying anything and everything. In fact, there was much disagreement about the best way to correct the problems. Some operators thought the waste rate should be increased, while others thought the waste sludge flow was already too high. Some thought the return activated sludge (RAS)

What's Your Lab Story?

The Lab Detective feature in *TPO* will help operators learn analytical techniques that help diagnose and solve treatment problems. Are you struggling with a process issue?

Send a note to editor@tpomag.com. Your question may become the topic of a future column.

flow should be decreased, and still others thought the dissolved oxygen was too high. It seemed the three shifts operated independently, each running the plant according to their liking.

After gathering and reviewing the plant data and talking with the shift operators, the detective formulated an action plan. First, he conducted a plant operations staff meeting to review his findings and ensure that all operators were on the same page. Second on the list was to attack the *Nocardia* on several battlefronts.

First, it is imperative to keep *Nocardia* from recycling back into the treatment plant through plant drains or digester supernatant or by hosing down of the foam on the tank surfaces. All operators were made aware of this.

Sludge wasting was increased to reduce the SRT. The sludge went into the digesters but was quickly hauled to a residual management facility (RMF), meeting EPA biosolids requirements without recycling *Nocardia* back into the plant.

Foam and scum removed from the tanks' surfaces with the vacuum truck were applied to existing sludge drying beds, allowed to dewater, and then also hauled to the RMF. High-test hypochlorite tablets were placed into the drain lines to chlorinate the drying bed filtrate.

A chlorine feed system was established to feed about five pounds of gaseous chlorine per day to each 1,000 pounds of mixed liquor volatile suspended solids. This dose was applied into the RAS wet well to give maximum detention time with the highest concentration of solids.

An industrial/commercial pretreatment department was formed to begin enforcement of the existing FOG ordinance. The department received authority to inspect grease traps, monitor pumping of the traps and enforce the city codes when sewer users did not follow the guidelines.

PERSISTENT ISSUE

Foam trapping is an issue in many plants that have compartmentalized tanks with submerged inlets and outlets. When foam gets trapped in treatment tanks, it can reseed itself when conditions are right.

Preventing foam trapping is a method of foam control. Some facilities have been able to use a physical barrier or baffle to remove the foam from the tanks, using the natural current of the tank or clarifier. In Figure 3, a 4-inch PVC pipe, capped on both ends and supported by chains, floats on the oxidation ditch surface near the tank's outlet weir. This barrier corrals the foam to the weir, where the foam then flows into the clarifier.



Figure 3 – A 4-inch PVC pipe, capped on both ends and supported by chains, floats on the oxidation ditch surface near the tank's outlet weir. This barrier corrals the foam to the weir, where the foam then flows into the clarifier.

Once the foam is in the clarifier, the surface sweep arms push it into the scum troughs. The foam then goes to digestion and out with the biosolids. This method has been very successful at the treatment plant described here.

The *Nocardia* foam and scum gradually decreased, and with about two weeks of effort, the facility was back into compliance with its permit. After about one month, the *Nocardia* was almost entirely gone from the clarifier surfaces. The staff received training on how to identify *Nocardia* with the microscope. Now, when they see even a little bit, they sound the alarm and take preventive measures.

POWER OF PRETREATMENT

One of the greatest achievements that came from this event was the formation of the city's industrial/commercial pretreatment program. This department has since made a continuous effort to monitor and enforce the sewer use ordinance that prohibits pouring FOG and other nasty substances down the drain. Pollutant metals have decreased in the plant biosolids, and *Nocardia* has not revisited the plant.

FOG continues to be one of the biggest problems faced by operators of today's treatment plants and collection systems. It contributes to sanitary sewer overflows (SSOs), sewer backups and lift station failures. Facilities that have challenges with FOG can find many solutions online, in workshops at wastewater association conferences, by contacting local Department of Health offices, by networking with neighboring utilities, or contacting me at the University of Florida TREEO Center.

ABOUT THE AUTHOR

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

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Letting Bubbles Do the Mixing

FULL-SCALE DEMONSTRATIONS AT TWO TREATMENT PLANTS DOCUMENT THAT LARGE-BUBBLE SYSTEMS MIX EFFECTIVELY WITH LOW ENERGY USAGE

By Stuart Humphries

The U.S. EPA report, *Evaluation of Energy Conservation Measures for Wastewater Treatment Facilities*, provides performance and cost/benefit information to encourage energy conservation measures (ECMs) at publicly owned treatment works. The report focuses on identifying and emerging ECMs, building on an extensive literature review of the effectiveness and costs of ECMs for municipal wastewater treatment.

One ECM featured in the report is the large-bubble mixing system, as opposed to coarse (smaller) bubbles. The large-bubble system uses compressed gas (air, nitrogen, methane) to intermittently and sequentially fire programmed short bursts of softball-sized bubbles from engineered, floor-mounted nozzles (Figure 1).

This energy-efficient mixing system can be installed in numerous wastewater treatment facility mixing applications, including biological process basins (anaerobic, anoxic, or aerobic), digesters (anaerobic or aerobic), sludge holding tanks, channels, pump stations, equalization tanks, and bulk chemical storage tanks.

Electric power requirements are very low, consisting only of the power needed to run the compressed air (or gas) source and the electronic valve control panels. Programmable logic controllers (PLCs) in the control units enable operators to control the firing parameters (such as pressure, sequence, duration, and interval) to optimize mixing based on the specific need. The exact mixing energy necessary at the time can then be used, instead of the excessive, constant amount required by mechanical mixers.

Electric power requirements are very low, consisting only of the power needed to run the compressed air (or gas) source and the electronic valve control panels. Programmable logic controllers (PLCs) in the control units enable operators to control the firing parameters (such as pressure, sequence, duration, and interval) to optimize mixing based on the specific need. The exact mixing energy necessary at the time can then be used, instead of the excessive, constant amount required by mechanical mixers.

EVALUATION: F. WAYNE HILL WRC

A full-scale demonstration project was performed from April 2009 through February 2010 at the 60 mgd F. Wayne Hill Water Resources Center in Gwinnett County, Ga., where the large-bubble system remains in operation.



FIGURE 1 – The large-bubble system uses compressed gas (air, nitrogen, methane) to intermittently and sequentially fire programmed short bursts of softball-sized bubbles from engineered, floor-mounted nozzles.

Results from *A Comparative Analysis* (May 2010), authored by Clifford W. Randall, Ph.D., Virginia Tech professor emeritus, and William O. Randall, P.E., identified that the large-bubble system provided comparable mixing to a submersible mechanical mixer, while requiring significantly less power and maintenance.

Virtually all power consumption was limited to one operating compressor, used to mix multiple process tanks, instead of a mechanical mixer in each process tank. The large-bubble system's rigid piping and stainless steel nozzles minimized in-tank maintenance requirements.

The plant has 10 parallel trains of modified Bardenpho biological treatment process tanks, each consisting of anaerobic, anoxic, and oxic cells with recycles for biological nutrient removal. For the demonstration, the large-bubble system was installed in multiple cells in Train 10. Within the anaerobic selector Cell A1 (41.5 by 55 by 24 feet),

	Submersible Mixer (x3)	Large Bubble System
Amps	66.15	15.14
Volts	472.2	483.0
Power Factor	0.56	0.93
Horsepower	40.62	15.79
HP/1000 ft ³	0.247	0.097
Kilowatts	30.30	11.78
\$/Yr @ \$0.06/kW-Hr	\$15,926	\$6,192
\$/Yr @ \$0.09/kW-Hr	\$23,889	\$9,287
\$/Yr @ \$0.12/kW-Hr	\$31,851	\$12,383

TABLE 1 – The large-bubble system showed even greater power reduction (more than 60 percent) when compared to three submersible mixers.

A1 Cell Mixing	Date	ORP, mV 95 th Percentile
Large Bubble System	02/01/2010	-158
	02/17/2010	-196
	02/18/2010	-160
Submersible Mixer	01/29/2010	-117
	02/12/2010	-173
	02/14/2010	-179
A2 Cell Mixing		
Large Bubble System	01/31/2010	-112
	01/30/2010	-102
Submersible Mixer	01/30/2010	-102
	02/15/2010	-178

TABLE 2 – Nitrates in the RAS provide for slightly higher ORP values in Cell A2. However, the results for both Cells A1 and A2 identified highly negative ORP, indicating anaerobic conditions for both mixing technologies.

(continued)



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the system was compared directly against the previously installed 15 hp submersible mechanical mixer with controls.

The large-bubble system consisted of an Ingersoll Rand 15 hp variable-speed rotary screw compressor, 30 floor-mounted nozzles, piping, and controls. Extensive TSS mixing analysis results were comparable, but the large-bubble system used 46 percent less power.

Power readings were also observed when mixing three process cells in Train 10. Each tank had similar large-bubble equipment configurations but used the same 15 hp compressor. Consequently, the system showed even greater power reduction (more than 60 percent) when compared to three submersible mixers (Table 1).

Continued analysis at the plant by Randall and Randall provided a comparison of oxidation reduction potential (ORP) in anaerobic selector Cells A1 and A2 of Train 10 between the large-bubble system and the mechanical mixers. Cell A1 receives primary clarified wastewater, which continues to Cell A2, receiving return activated sludge (RAS) at the adjoining wall.

Nitrates in the RAS provide for slightly higher ORP values in Cell A2. However, the results for both Cells A1 and A2 identified highly negative ORP, indicating anaerobic conditions for both mixing technologies (Table 2).

As part of a facility-wide phosphorus study in October 2010, plant personnel collected orthophosphate (as P) data (Figures 2 and 3). Trains 5 and 7 used mechanical mixing (data represented by vertical bars), while Train 10 used the large-bubble system (data represented by a line). Cell A2 is the second of two anaerobic selector cells, and Cell C6 represents the end of the oxic treatment process.

The variance in the orthophosphate (PO₄-P) data between trains for the respective process tanks was insignificant. Therefore, the orthophosphate release rate was similar using either mixing technology, and so was the luxury uptake rate within the oxic section toward the end of the biological treatment process.

This direct-parameter data verified the indirect-parameter ORP data examined by Randall and Randall. Thus, the compressed-air, large-bubble mixing system was further validated for use in anaerobic biological wastewater treatment processes.

EVALUATION: MAULDIN ROAD WWTP

Renewable Water Resources (ReWa), of Greenville, S.C., compared the large-bubble system against existing mechanical mixers at its 70 mgd Mauldin Road Wastewater Treatment Plant from May through July 2011. The large-bubble system, using an oversized 5 hp rotary screw compressor, was installed in Train BR2-1, anoxic Cell 1C (30.8 by 39.9 by 14.6 feet), of the facility's modified A2/O process.

The large-bubble system was compared directly against parallel Train BR2-2, anoxic Cell 2C, which uses a 15 hp submersible mechanical mixer. The energy usage of the large-bubble system was estimated to be less than 30 percent that of the mechanical mixer.

During the testing period, operations personnel collected 27 samples and analyzed them for nitrate (NO₃-N), dissolved oxygen (DO), ORP, and PO₄-P. ReWa personnel determined that the variance in the data between trains for anoxic Cells C was insignificant. Table 3 presents the average values of the analysis for each mixing technology.

Thus, operation of the large-bubble system provided energy-efficient anoxic reactor mixing with effective denitrification. ReWa personnel also project reduced maintenance costs, as the large-bubble system has no submerged mechanical or electrical components.

COMPARISON SUMMARY

Large-bubble mixing systems provided significant power and maintenance savings when compared to submersible mechanical mixer installations in these tests. When installed in multiple process basins, a single large-bubble compressed air (or gas) source can be

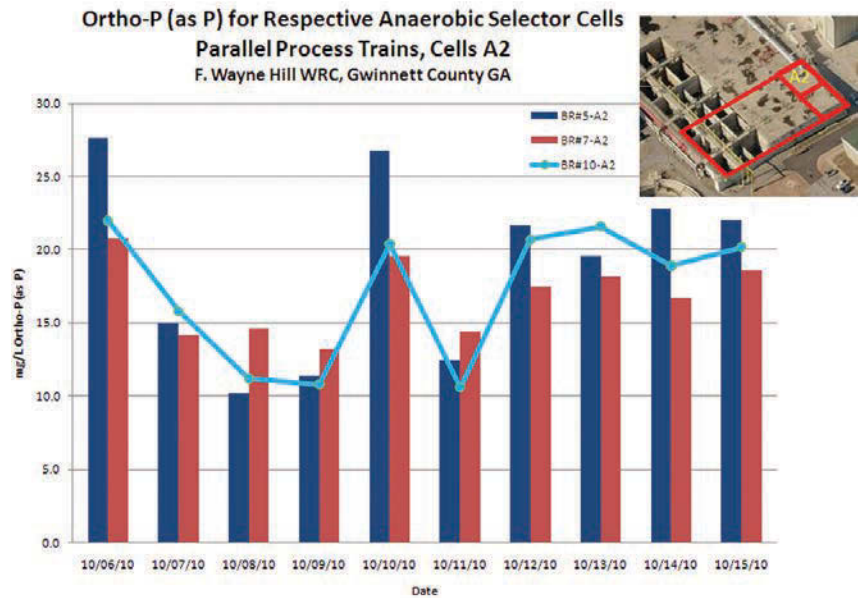


FIGURE 2 – As part of a facility-wide phosphorus study in October 2010, plant personnel collected orthophosphate (as P) data for anaerobic selector cells.

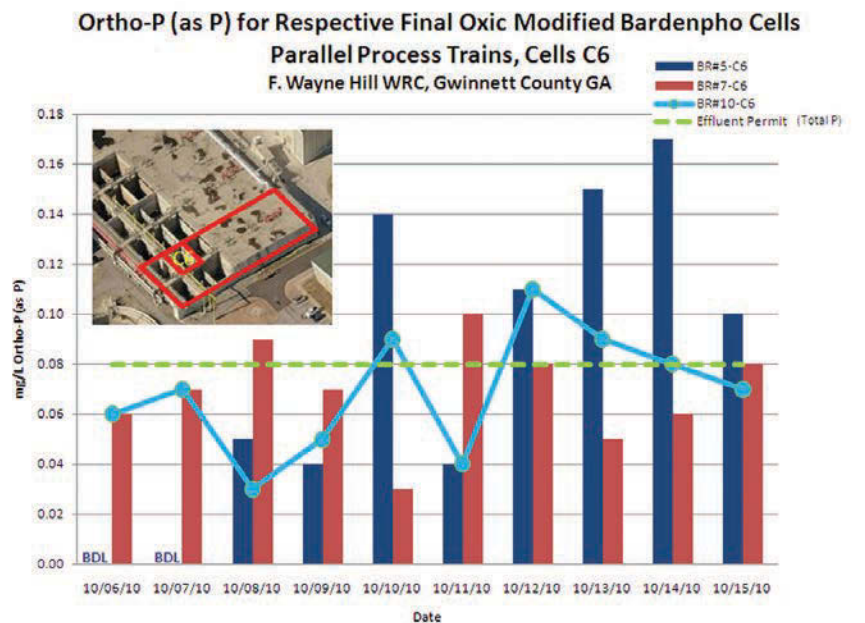


FIGURE 3 – As part of a facility-wide phosphorus study in October 2010, plant personnel collected orthophosphate (as P) data final oxic modified Bardenpho cells.

used to mix several basins. Randall and Randall state, “With large-bubble mixing systems added to a treatment process, these advantages become more compelling, as each tank mixing system further increases the overall efficiency of the plant.”

ABOUT THE AUTHOR

Stuart Humpries is director of sales for EnviroMix LLC, a provider of mixing and process control technologies for the municipal and industrial wastewater markets. He can be reached at shumpries@enviro-mix.com. tpo

	Large Bubble System (1C)	Mechanical Mixer (2C)
NO ₃ -N (mg/L)	2.19	2.39
DO (mg/L)	0.27	0.26
ORP (mV)	-18.58	-18.68
PO ₄ -P (mg/L)	11.14	10.29

TABLE 3 – Average values of the analysis of nitrate (NO₃-N), dissolved oxygen (DO), ORP, and PO₄-P for each mixing technology at the Mauldin Road Wastewater Treatment Plant.

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One-Stop Information Shop

A WEBSITE CREATED SPECIFICALLY FOR SMALL WATER AND WASTEWATER SYSTEMS HELPS OPERATORS QUICKLY FIND RESOURCES ON A FULL RANGE OF IMPORTANT TOPICS

By Ted J. Rulseh

Hundreds of agencies and organizations publish information of value to clean-water operators — and much of it comes free over the Internet. But how do you find exactly what you need without hunting and pecking online for hours?

That's especially an issue for operators of small systems, who may not have time for lengthy Web searches. Now there's a website that helps visitors quickly find the most relevant information for whatever they may need at a given time.

SmallWaterSupply.org is a free resource designed specifically for small-community water and wastewater professionals. It's housed at the Illinois State Water Survey (ISWS) at the University of Illinois. The ISWS is part of the Prairie Research Institute and is also the home of the Midwest Technology Assistance Center (MTAC), which provided the funding (via the U.S. EPA) to develop the site.

Besides providing an extensive, searchable database of varied resources, the website includes a blog, a weekly e-newsletter, an event calendar, and user forums for exchanging information on current issues or treatment problems.

Visitors will also find information on meeting customer right-to-know requirements and advice on how to talk and share information with customers. The staff is developing information for those who want to learn about careers in water professions. Staff members are on hand to assist operators by phone or email to get them to the right expert, resource, or organization.

Steve Wilson, manager of the website, groundwater hydrologist, and assistant director for research with MTAC, talked about the site in an interview with *Treatment Plant Operator*.

"We link only to information that can be found for free on the Internet, and our calendar displays only events relevant to water and wastewater operators."

STEVE WILSON

tpo: How did this website come into being?

Wilson: We're a U.S. EPA grantee and have been for about 12 years. MTAC's mission is to provide technical and managerial support for small water systems. We went to the EPA with the idea to develop this site with the funding they give us. They thought it was a good idea. We started work in early 2009 and launched the site the next October.



PHOTO COURTESY OF STEVE WILSON

The SmallWaterSupply.org team includes, from left, data writer Jeannine Adomaitis, project manager Steve Wilson, data writer Raeann Sheley, data manager James McAuley, and data writer Christina Cornelius. Not pictured: Jennifer Wilson, Reese Taylor, Brittany Simon, and Kacie Dieter.

tpo: What is the central idea behind this project?

Wilson: The idea is fairly simple. Small system operators are really busy folks who often don't have much spare time. Operators in really small systems may have other full-time jobs and run the water or wastewater system on the side. Or they may run the water and wastewater systems and do other things for the community as well. Through this site, we have done all the legwork and have made it easy for them to find information available from some 750 organizations, all in one place.

tpo: How do you define a "small" water or wastewater system?

Wilson: It's defined by the EPA as a system serving under 10,000 people, or another definition is under 3,300 connections. Our focus isn't even really on the towns of 10,000, but more so on towns of under 1,000.

tpo: What is the basic structure and approach of this website?

Wilson: Because so many organizations have worthwhile infor-

"We've added a summary of what each document is, how many pages it is, and who the host is. So operators can look through the list of results without having to go to each document, download it, and review it to decide if it's what they want."

STEVE WILSON



SmallWaterSupply.org is a free online resource designed for small-community water and wastewater system professionals.

mation and resources available online for water and wastewater operators, our aim is to catalog those resources in a database that is easy to filter and search. All information is linked back to the original author or host, and that helps those organizations get their resources out to operators. We link only to information that can be found for free on the Internet, and our calendar displays only events relevant to water and wastewater operators.

tpo: How extensive is this material?

Wilson: The database includes more than 11,000 document summaries in 28 categories. These include videos, CDs, manuals, fact sheets, and much more. The information is easy to find by topic, by type, by state, or by sponsoring organization. We have also listed more than 24,000 training events since the site's inception.

There are almost 1,000 documents from the EPA alone. If you've ever tried to use the EPA website, even folks who work there will tell you how hard it is to find things. That's inevitable with an organization that big and in charge of that many rules and regulations. We went through their Web page and found all the relevant documents, which are now listed in our database. There's really a lot of useful material.

tpo: For example?

Wilson: The EPA offers the Check Up program for Small Systems (CUPSS), an asset management software they developed that's free for download. It helps you set up depreciation schedules. It has a calendar so you can set up when to collect your samples. That and a lot more basic tools for very small systems — say, under 500 connections.

tpo: Who does all the work of maintaining this site?

Wilson: Six University of Illinois students work for me. They all

took a crash course in operator basics and terminology. We have a list of organizations, and each student is assigned a specific number of them. They include the WEF Member Associations, the AWWA state sections, every state Rural Water Association, the state regulatory agencies, EPA and other federal agencies.

It also includes the Rural Community Assistance Partnership (RCAP). They have six regional offices around the country; they do technical assistance and they have information and documents online. It's meant to be a very comprehensive website.

tpo: How do you keep all this information current?

Wilson: The students go back through the links once or twice a year to check that they are still good and to look for new information. It's cumbersome, but the only way to make this site useful is if everything works and is timely.

We use a reminder system in our database. When they look at a site, they enter the date. Then, depending on how often the organization typically updates its information, they enter a number of days for receiving a reminder.

tpo: How much of the information relates to drinking water and how much to wastewater?

Wilson: We're funded through the EPA Office of Groundwater and Drinking Water, but in many small communities, it's the same person or the same group operating both water and wastewater systems. Recently we have focused on adding wastewater resources. Our document search categories include topics such as biosolids, nutrient control, sanitary sewers, wastewater discharges and effluent, water reuse, operations and maintenance, operator certification training, and certification exam preparation.

tpo: What's an example of how an operator might use the search function?

Wilson: In every state I talk to, the biggest reason operators fail a certification exam is the math. A search under "certification exam preparation" brings up 136 documents. If you go to the keyword filter and type in "math," you bring up resources like an advanced math study guide from the West Virginia Department of Health and Human Services. It's an 88-page handbook.

We've added a summary of what each document is, how many pages it is, and who the host is. So operators can look through the list of results without having to go to each document, download it, and review it to decide if it's what they want.

Now suppose you're a small-system operator interested in developing an emergency response plan. You can select the category of "water security and emergency response" and retrieve 724 documents. If you add the keyword "emergency response plan," that narrows it down to 70. Then you can search by document type for "forms and templates," and you've sorted down to 24 documents, all with "emergency response plan" in the title or summary. Now you can easily find documents that will walk you through how to set up your emergency response plan.

tpo: What sort of services do you offer via email or phone?

Wilson: Suppose you're an operator in Colorado on the western slope of the Rockies, or in some other remote area where all you have is dial-up Internet. To download a 200-page document for print-

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ing would take several hours. If you want a document but you don't have a way to print it, or if it's in color and you don't have a color printer, you can call or email us, and if you're a small-system operator, we'll print it and mail it to you for free.

tpo: What kind of content do you cover in the blog?

Wilson: We write a blog post every Monday on how to run a water system like a business. It covers topics like financial management, asset management, having an emergency response plan, and other topics that lead to a better-managed system. On Fridays we have an item called "Stuff We Love." Usually it's a website or document or something else we found that is really useful for operators.

"We write a blog post every Monday on how to run a water system like a business. It covers topics like financial management, asset management, having an emergency response plan, and other topics that lead to a better-managed system."

STEVE WILSON

tpo: What sort of information might visitors get from the e-newsletter?

Wilson: To cite one example, back in March 2011 we had a story on how to map a small water system. Google had come out with a software called Spreadsheet Mapper 2.0. If you have a handheld GPS, it allows you to go out and use this software with GoogleEarth and map all your assets. You don't need any GIS training — only a handheld GPS unit. It's a cheap but useful way for operators to at least know where all their valves, manholes and hydrants and things are. We started the year with about 90 newsletter subscribers, and now there are more than 500.

tpo: What are you doing in the career development area?

Wilson: Soon we will have a list of all the operator schools that are available in the country. By operator schools I mean certificate programs. WEF and AWWA have created a website called Work for Water. There you can see two-year and four-year engineering and environmental science programs, but no listings for operator schools.

There are probably no more than 20 operator schools around the country. These are one-year programs or even just one-semester programs to prepare people to become operators. A small system serving 500 people isn't going to hire a civil engineer who graduated from the University of Illinois. It's going to be someone who is out of high school and has maybe taken some classes or maybe not.

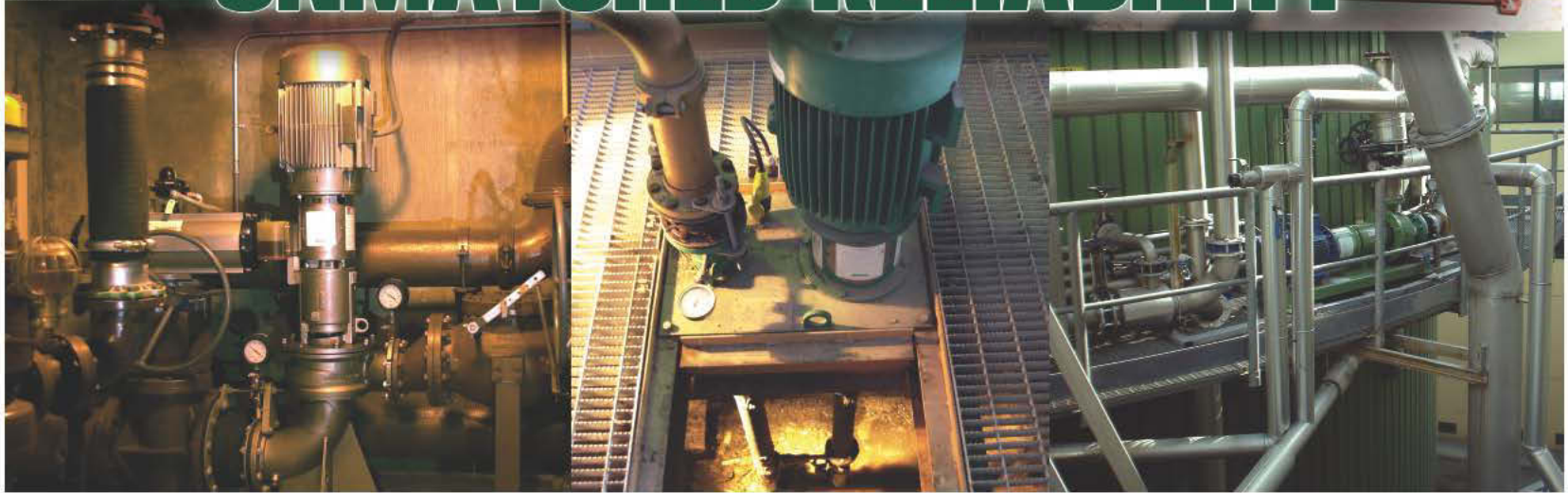
There's a big shortage of operators coming, and we want to get more young folks interested in becoming operators. Anyone who gets into water and wastewater today most likely will always have a job.

tpo: What kind of traffic are you seeing on the website?

Wilson: We have been averaging about 800 to 1,000 hits per month. There are only about 43,000 small systems in the country, so the audience is not that huge. All our resources are free. We don't advertise for anybody. We're just providing a service. **tpo**



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By Briana Jones

MULTIPLE-PATH FLOWMETER

The Model 7720 Transit-Time flowmeter from Accusonic Technologies addresses difficult installation requirements common to large UV disinfection systems. The maximum 10-path capability allows the unit to measure with accuracy and repeatability, even in the presence of distorted flow profiles. The pipe section length required for installation is less than for other flow measurement technologies, according to the manufacturer. Measurable pipe and channel sizes range from 8 inches to 600 feet. Using multiple-path, chordal, transit-time technology, accuracy is ± 0.5 percent in full pipes and ± 2.0 percent in partially full pipes and channels. **508/273-9600; www.accusonic.com.**



Model 7720 Transit-Time flowmeter from Accusonic Technologies

DATA MANAGEMENT

Antero version 5 from AllMax Software is a user-friendly maintenance data management program that bridges the needs of performance, security and data governance with focus on accountability and reducing maintenance costs and downtime. It helps plants comply with strict industry and regulatory requirements. The software includes a Microsoft SQL database engine, which is scalable and capable of handling more records and data than previous versions.



Antero version 5 from AllMax Software

Other benefits include the ability to share information among multiple facilities, Windows login for automatic user validation, and group security. A work order section allows for data associated with work orders and multiple equipment/task combinations to be generated at one time. The work order builder enables improved data flow from setup to creation. Features include a gallery for storing images and attached documents, newly redesigned reports, and an in/out of service history section for better tracking of maintenance and related data. **800/670-1867; www.allmaxsoftware.com.**

CHEMISTRY MODULES

ATI gas phase chemistry modules from Analytical Technology are online monitoring systems that use air-stripping methodology. This method is designed for sample streams that are highly contaminated with solids or biological activity. Modules for dissolved oxidants employ iodometric chemistry to prepare the sample stream for measurement. Modules for non-oxidizing chemicals use pH adjustment of the sample before measurement.

After chemical addition, the air pump provides a continuous stream



ATI gas phase chemistry modules from Analytical Technology

of ambient air to the reactor assembly to release the analyte from the water phase and into the gas phase. A special gas phase sensor detects the chemical concentration in the air stream. By using air-stripping, the sensor is removed from the liquid phase, preventing contaminants from fouling the sensor. The technology requires less maintenance. Modules are available with total residual chlorine, residual sulfite, dissolved sulfite, and potassium permanganate monitors. **800/959-0299; www.analyticaltechnology.com.**

DIGITAL PRESSURE GAUGE

The PG10 digital pressure gauge from Automation Products Group (APG) for indoor/outdoor use is IP65 rated. The unit features a 5.5-inch display casing, a full five-digit display with 0.68-inch-tall characters, and a 270-degree digital dial or radial bar graph that shows a user-selectable pressure range from 0 to 100 percent. Four large setup buttons provide at-a-glance readability. Standard features include tare, peak hold, maximum-minimum readings, user-selectable units of measure, and an auto-off timer.



PG10 digital pressure gauge from Automation Products Group

Options include two solid-state relays or SPDT mechanical relay outputs for basic to semi-advanced automation. With an operating temperature range from 0 to 160 degrees F, the unit offers ± 0.25 percent accuracy of full scale, and features pressure ranges from vacuum to 500 psi, or 0 to 10,000 psi. Outputs are 0-2 VDC for battery-powered units, 4-20 mA for loop-powered units, and 0-5 VDC for externally powered units. Data logging provides local access to the latest 60 readings. **888/525-7300; www.apgsensors.com.**

GAS DETECTOR



Jerome J605 hydrogen sulfide analyzer from Arizona Instrument

The Jerome J605 hydrogen sulfide analyzer from Arizona Instrument can read 3 parts per billion with a resolution of 20 parts per trillion. The unit is housed in a light, ergonomically designed case. Gold film technology extends unit life. With the addition

of mercury vapor or hydrogen sulfide gas, a thin gold film undergoes an increase in electrical resistance proportional to the mass of mercury vapor or hydrogen sulfide in the sample. During normal sampling in range 1 or 2, an ambient air sample is diluted by the flow system at a ratio of 100:1. When sampled in range 0, undiluted air samples are drawn across the gold film sensor. **800/528-7411; www.azic.com.**

SENSORS AND TRANSMITTERS

ProSense pressure sensors and temperature transmitters from AutomationDirect offer high operating and burst pressures for hydraulic systems, biotechnology, and other applications. Available in zero to 10V and 4-20 mA output models, the sensors are IP68/IP69K rated at 5,000 psi.



ProSense pressure sensors and temperature transmitters from AutomationDirect

TTD temperature transmitters, for use with RTD probes, are available in three temperature ranges. Equipped with M12 quick-disconnects for fast wiring, they provide high-accuracy two-wire or three-wire 4-20 mA signal output. The IP67-rated units convert low-level RTD temperature probe output signals to high-level analog signals, making them appropriate for long-distance transmission. **678/455-1845; www.automationdirect.com.**



SLUDGE BLANKET METER

The CBX sludge blanket meter from Cerlic Environmental Controls uses a near-infrared (NIR) suspended solids sensor to measure solids concentration as a probe is lowered into clarifiers. The operator enters concentrations for blanket and fluff, and the meter outputs the depth at which concentrations are reached. Features include 4-20 mA output or Profibus DP signal. The stainless steel

CBX sludge blanket meter from Cerlic Environmental Controls

meter will operate at temperatures down to -4 degrees F. The sensor is triggered by a rake hitting a limit switch. Also available is a portable sludge blanket tracker that measures suspended solids and has a pressure sensor to show liquid depth. 404/256-3097; www.cerlic.com.

PHOSPHATE ANALYZER

The CA-6 online analyzer from Electro-Chemical Devices uses colorimetric analyses to accurately measure phosphate and total phosphate levels. It is available in models measuring phosphate at 0-0.5 mg/l, 0-50 mg/l, or 0-200 mg/l and total phosphate at 0-2.0 mg/l, 0-20 mg/l, or 0-100 mg/l. The unit weighs less than 40 pounds and can be wall-mounted or set on a bench using the optional benchtop stand.

After the sample, waste and reagent lines have been connected to the unit and provided with power, the analyzer begins its preprogrammed analysis sequence. It is available with up to four channels (optional), each from a separate sample point. A user-friendly menu structure and touchscreen interface make it easy to access information or customize analyses. Two separate compartments isolate liquid and electronics. The unit is enclosed in an epoxy powder-coated, cold-rolled steel cabinet. 800/729-1333; www.ecdi.com.



CA-6 online analyzer from Electro-Chemical Devices



SPEED SWITCH

The UDS1000 unidirectional speed switch with 907B sensor and wrap from Electro-Sensors monitors high-service pump shafts to protect against reverse rotation. The unit constantly monitors a shaft to ensure that it is turning in the correct direction.

UDS1000 unidirectional speed switch with 907B sensor and wrap from Electro-Sensors

Relay contacts in the unit can be used to electrically lock out the starting circuit of the pump to prevent accidental startup during reverse rotation. It continuously monitors incoming pulses from the sensor and magnetic wrap. A failsafe relay output is electrically interlocked directly to the motor starter circuit for the pump. If the slightest reverse rotation of the pump shaft is detected, it disables the pump starting circuit, preventing damage. 800/328-6170; www.electro-sensors.com.

STATIONARY SAMPLER

The Liquistation CSF from Endress+Hauser is a stationary sampler for fully automatic sampling, distribution and storage of liquid media. It is based on the Memosens Liquiline platform. The sampler features four housing materials, two-door housing for safe sample preservation,



Liquistation CSF from Endress+Hauser

and a sample compartment with inner shell and forced-air cooling.

It has clear menu guidance, a comfortable navigator and a large display. The unit has split bottle trays for safe transport. No tools are required for cleaning and maintenance. It has an integrated data logger and service interface for data transmission. Sample intake is available from the side or the bottom. 888/363-7377; www.us-endress.com.



Model IR700 infrared carbon dioxide point detector from General Monitors

INFRARED DETECTOR

The Model IR700 infrared carbon dioxide point detector from General Monitors provides complete control room status, control capability for monitoring at the ppm level and does not require routine calibration. Features include a fail-safe design, heated optics to eliminate condensation, a dirty optics indicator and microprocessor-based technology to continuously monitor CO₂ at a range of 0-5,000 ppm. 866/686-0741; www.generalmonitors.com.

METERS AND PROBES

HQd meters and IntelliCAL probes from Hach are designed for demanding environments. IP67 rated portable and benchtop meters measure influent, effluent and process streams. Large, bright backlit displays are easy to read night or day. The meters also offer internal data storage and the ability to enter user IDs and sample IDs to ensure data integrity.



HQd meters and IntelliCAL probes from Hach

Field and laboratory probes measure pH, dissolved oxygen (DO), conductivity and ORP. ISEs are also available to measure ammonium, ammonia, chloride, fluoride, nitrate and sodium. Because all calibration data is captured and stored on digital probes, smaller facilities can use a single multiparameter meter to perform multiple measurements. All meters and probes can be ordered individually or as pre-packaged kits that include buffers, electrode stand, and field cases. 800/227-4224; www.hach.com/hqdguide.



G460 compact multigas detector from GfG Instrumentation

MULTIGAS DETECTOR

The G460 compact multigas detector from GfG Instrumentation detects up to six gases simultaneously. Installed sensor options include infrared (NDIR) for CO₂ and PIC for VOC measurements. The unit offers automatic calibration, one-button operation, top-mounted display and interchangeable battery packs for up to 25 hours of continuous operation. The rechargeable NiMH battery pack can be equipped with flashlight LEDs.

The large, high-resolution top display can be flipped 180 degrees by pressing two buttons. The watertight design incorporates an impact-proof, rubberized housing to meet tough requirements. The data logger records over 1,800 gas concentrations and alarms, and the data can be downloaded to a PC for viewing, storage and evaluation. A detachable, self-powered pump is available for sampling confined spaces before entry. It allows operation of the unit in diffusion or sample-draw modes. 800/959-0329; www.gfg-inc.com.

(continued)

CHLORINE SENSOR

The OPTISENS AAM 1100 sensor from KROHNE is a ready-to-use system that measures free chlorine with flow monitoring and automatic temperature compensation. The system includes automatic sensor cleaning (ASR), flow-independent measurement above 30 l/h, simple calibration, and optional pH compensation for fluctuating pH values above 7.5. The potentiostatic chlorine sensor in the system has no membrane and so no pores to become clogged by biological fouling. The unit has two gold electrodes, and the cleaning feature automatically cleans them daily to remove any coating. **800/356-9464; www.krohne.com.**



OPTISENS AAM 1100 sensor from KROHNE



DCX-25 PVDF water level logger from Keller America

AUTONOMOUS LOGGER

The DCX-25 PVDF autonomous water level logger from Keller America records water depth (pressure) and temperature over long periods. The housing is made of polyvinylidene fluoride and the sensing diaphragm is available in Hastelloy C-276 or titanium 6AL-4V. This combination offers long life and allows for extended exposure to aggressive media. The battery-powered data collector integrates a pressure sensor, electronics employ microprocessor technology, which gives high accuracy and resolution for the pressure and temperature signals. The built-in pressure sensor is mathematically compensated for all linearity and temperature errors.

The data collector is secured by a suspension cable and immersed in the media to be measured and must be covered for data readout. The logger opens easily, allowing access to the replaceable battery and the interface connector for configuration and data download. The included software provides the capability to retrieve stored data and customize the instrument as needed. Users can configure it to record at fixed time intervals, using fixed or event-based start times in user-selectable measurement units. **877/253-5537; www.kelleramerica.com.**

FIXED GAS MONITOR

The OLCT 200 fixed transmitter from Oldham is suited for gas monitoring in remote, hazardous or difficult-to-reach locations. It is designed for use with multiple gas detection technologies, including electrochemical sensors (H_2S , Cl_2 and O_2) and infrared (IR) sensors that provide detection of combustible gases, such as methane, in more severe environmental conditions where the presence of poisons like H_2S could harm the use of a catalytic cell.

The unit can be configured for two-wire and three-wire 4-20 mA analog output, Modbus RU digital output, HART, and wireless communication. Features include optional onboard programmable relays, a durable explosion-proof housing to resist corrosive agents, and a cold-climate heater. A completely wireless system, the self-contained transmitter includes onboard battery power and wireless data transmission for most of the unit's gas sensors. The 900 MHz or 2.4 GHz wireless communication is compatible with all of the company's WX series alarm controllers and MPSIV mobile monitoring system. **800/338-3287; www.oldhamgas.com.**



OLCT 200 fixed transmitter from Oldham

WATERPROOF COLORIMETER

The SMART3 colorimeter from LaMotte features a waterproof housing, a library of over 75 preprogrammed tests, and USB communications. The expanded backlit display is loaded with seven languages. The unit has a removable clear cell that protects the optical system from the elements and is IP67 compliant. Users can select from a scrolling menu of preprogrammed test factors or set up their own groupings for routine analyses.



SMART3 colorimeter from LaMotte

Operators can add new user tests or download them from the manufacturer. Time- and date-stamped test data can be stored in the 500-test-capacity data log. The USB port permits data transfer to a PC and powers the rechargeable NiCad battery. The system includes a USB cable, power adapter, six glass vials, and a special adapter for holding COD vials or square cuvettes. **800/344-3100; www.lamotte.com.**

PLUG-AND-PLAY ANALYZER

The plug-and-play Krypton K series free chlorine analyzer from Kuntze Instruments uses automatic sensor cleaning (ASR) electrode technology, reducing maintenance and calibration demand. The analyzer replaces the need for reagents or membrane refurbishment. There is no waste stream or moving parts. The unit includes two PI controllers via a 4-20 mA output and two relays. Also available in chlorine dioxide, ozone and hydrogen peroxide. **724/339-8510; www.kuntzeinstruments.com.**



Krypton K series free chlorine analyzer from Kuntze Instruments

chlorine dioxide, ozone and hydrogen peroxide. **724/339-8510; www.kuntzeinstruments.com.**

PORTABLE SLUDGE LEVEL DETECTOR

The handheld Sludge Gun from Markland Specialty Engineering can be used to find liquid sludge levels in primary and secondary clarifiers, DAF units, settlement tanks and lagoons. Power intensity is customized to detect clear liquid surfaces or sludge densities ranging from light flocs to thick blankets. No calibration is required.



Sludge Gun from Markland Specialty Engineering

A spring-loaded trigger turns on the gun, and a thumb-adjustable sensitivity control compensates for thin or thick sludge. A tone is emitted as the optical probe enters the bed, varying in volume and pitch depending on concentration of solids. By observing the depth markers on the cable, the operator establishes the location of the sludge blanket and the overlying unsettled cloudy layer. After use, the cable is wound at the self-storing spool at the front of the gun. **905/873-7791; www.sludgecontrols.com.**

ONLINE ANALYZER

Applikon DI Alert online analyzers from Metrohm USA monitor more than 20 contaminants. Colorimetric or ion-selective techniques allow for analysis of ammonia, calcium, chloride, free and total chlorine, copper, iron, nickel, nitrate, phosphate, silica and zinc. Other parameters are available on request. Users connect the sample and reagent lines, connect the power, and have results in less than two hours. **800/727-6768; www.metrohmusa.com/applikon.**



Applikon DI Alert online analyzers from Metrohm USA

DIGITAL METERING PUMP

The Centrac digital metering pump from Milton Roy is an integral component of a process controlled by SCADA systems. The unit offers high turndown flexibility with ± 0.5 percent steady-state accuracy over the full range. An optional advanced diaphragm integrity alarm gives indication of any issue before the process or pump is compromised. The unit is offered in a wide range of wetted materials. Models are available for capacities from 0.06 to 1,100 gph. Pump performance is not affected by changes in discharge pressure. The pump has a 45,000-hour diaphragm design life. **215/441-0800; www.miltonroy.com.**



Centrac digital metering pump from Milton Roy



OdoWatch 3.0 real-time odor monitoring system from Kruger USA

ODOR MONITORING

The OdoWatch 3.0 real-time odor monitoring system from Kruger USA helps wastewater treatment plants prevent odors before they become a problem. EPA-approved AERMOD modeling follows the odor plume over complex terrain.

Municipalities receive alerts when odors from a plant approach areas outside the predetermined parameters. Plants can then prioritize the processes that need the most attention so that upgrades can be planned. Plants can reduce the use of chemicals to dose odor sources and get more odor control by dosing only when needed.

OdoSulf uses real-time, continuous views of the local impact of H_2S . **919/677-8310; www.krugerusa.com.**

SINGLE-CHANNEL MONITORING

The single-channel gas alarm from Mil-Ram Technology is for toxic, oxygen, VOC and LEL combustible gas detection. The unit includes an integrated strobe and horn for a visual/audible alarm.

Features include off-site sensor calibration to replace sensors in the field without recalibration; auto gas calibration; non-intrusive, hands-free magnetic switches; self-calibration that adjusts span monthly based on the sensor life curve; 12-character by two-line LCD display; operating voltage of 110/220 VAC; output of 4-20 mA; and optional Modbus RTU that allows multidrop installations. **888/464-5726; www.mil-ram.com.**



Single-channel gas alarm from Mil-Ram Technology



ScalableSCADA from Revere Control Systems

RADIO ANALYSIS SCADA

ScalableSCADA from Revere Control Systems includes comprehensive radio path analysis and testing services that assure paths, elevations, and frequencies for all sites in the network will meet operational standards. Such services help in the selection of the best available communication technology, tower placement and design, helping to achieve maximum system efficiency and effectiveness.

The system also features non-proprietary hardware; UHF, VHF, 928/953 MHz, MAS, spread spectrum, or cellular communication technology; I/O only to PC-based units; scalable without limits; ISA-CCST certified technicians; and CSIA certified. **800/536-2525; www.reverecontrol.com.**

PEN TESTER

The ULTRAPEN PT1 tester from the Myron L Company tests conductivity, TDS and salinity.

The pen features the accuracy and stability of benchtop lab equipment with the convenience of a pen. Constructed of durable aircraft aluminum, the pen is fully potted for extra protection with an easy-to-read LCD and one-button functions. Users can select from three solution standards: KCl, NaCl and the company's 442 proprietary standard for natural water. **760/438-2021; www.myronl.com.**



ULTRAPEN PT1 tester from the Myron L Company



Gastec pumps and detector tubes from Nextteq

DETECTOR TUBES

Gastec pumps and detector tubes from Nextteq measure gases and vapors in more than 600 applications. The lightweight, one-stroke piston action of the pumps provides reliable operation with no partial samples. The thermal ring provides on-the-spot measurements of ambient temperature for tests that require temperature correction. The direct-read length of stain tubes offers distinct lines of demarcation for easy viewing. **877/312-2333; www.nextteq.com.**

REMOTE MONITORING

The I-Link cellular RTU from SJE-Rhombus is a remote monitoring system using an integral cell-based communications gateway to provide two-way communication for monitoring lift stations and other pumping applications. The system consists of a hardware interface and customized data access through the I-Link Web portal. The Web portal provides real-time system information, including monitored equipment, administrative services, report generation and alarm notifications. The system is available in two models for new or retrofit applications.

I-Link sends custom alarm notifications and descriptions to a cellular or landline phone, via SMS text messaging or email text. Users can view data on demand and pull reports, trend charts and data tables from an unlimited historical database. Data can be exported to other applications, such as Excel, for further analysis or reporting. **888/342-5753; www.ecosmartpanel.com/ilink.html.**



I-Link cellular RTU from SJE-Rhombus



StationComm from Smith & Loveless

TWO-WAY COMMUNICATION

StationComm from Smith & Loveless is a cellular-based automated alarm texting system that provides two-way communication between users and pump stations. Pump station operators can text pump stations to remotely operate and maintain the control panel. Supervisors receive simultaneous messages while the unit sends sequential service messages to as many as 10 operators. The system automatically texts operators with various alarm messages, including pump failure, prime failure, high water and power failure. Various status checks include wet well level, pump run time, station temperature, flow rate and motor amperage. **800/898-9122; www.smithandloveless.com.**

SCADA SOFTWARE

The Verbatim SCADA system from RACO Mfg. and Engineering Co. ensures continuous monitoring, reporting, data logging and alarm autodialing while offering on-demand remote access. The "report by exception" function ends the need to constantly poll verbatim RTUs — operators only get called when there is an alarm. The system is scalable, making fleet expansion easy. It is also available for Windows operating systems. **800/722-6999; www.racomn.com.**



Verbatim SCADA system from RACO Mfg. and Engineering Co.

TOC ANALYZERS

TOC-L series total organic carbon analyzers from Shimadzu Scientific Instruments feature a wide sample range from 4 µg/l to 30,000 mg/l, making them suitable for ultrapure to highly contaminated samples. Consisting of four models, including PC-controlled and stand-alone versions, the units use a 680 degree C combustion catalytic oxidation method to analyze organic compounds. The series features automatic sample acidification and sparging, and an automatic function that reduces sample



TOC-L series carbon analyzers from Shimadzu Scientific Instruments

units use a 680 degree C combustion catalytic oxidation method to analyze organic compounds. The series features automatic sample acidification and sparging, and an automatic function that reduces sample

salinity, acidity and alkalinity, extending the life of catalysts and combustion tubes.

The analyzers feature variable syringe sizes when the sample volume is limited. A no-maintenance Peltier cooler used for maximum water vapor removal and high-precision mass flow controllers ensure uninterrupted carrier gas for accurate analysis. An onboard air purifier may eliminate the need for high-purity air during testing. Optional salt kits are available. The ASI-L autosampler can use three vial sizes for various applications, while the smaller OCT-L autosampler can use any vial size for up to 8 or 16 samples. **800/477-1227; www.ssi.shimadzu.com.**

THERMAL MASS FLOWMETER

The Chlorine-Trak 760S thermal mass flowmeter from Sierra Instruments is designed to measure solution for chlorine injection processes. Made of Kynar polyvinylidene fluoride resin (PVDF), the meter is corrosion and chemical resistant at both ambient and elevated temperatures. PVDF also is abrasion and flame resistant. The meter has a flow range up to 300 scfm in a 4-inch body. Features include digital display with instantaneous and totalized flow and digital Modbus RTU option for PLC/DAQ integration and analog 4-20 mA output. **800/866-0200; www.sierrainstruments.com.**



Chlorine-Trak 760S thermal mass flowmeter from Sierra Instruments

MULTIPARAMETER MONITORING

The YSI IQ sensor net system from Xylem Analytics offers fast and flexible multiparameter wastewater monitoring. The single system provides measurements of pH/ORP, conductivity, dissolved oxygen (DO), temperature, turbidity/TSS, ammonium,



YSI IQ sensor net system from Xylem Analytics

nitrate and chemical oxygen demand (COD). Up to 20 sensors measuring any combination of 16 parameters can be monitored, logged and transmitted from a single controller and displayed from one, four or multiple sensors simultaneously.

The system eliminates sample preparation and removes lag time between sampling and measurement. Minimal maintenance is required. Plug-and-play connection to any IQ sensor makes the unit expandable for more sensors. **781/937-4100; www.xylemanalytics.com.**

RESIDUAL CHLORINE ANALYZER

The RC400G residual chlorine analyzer from Yokogawa uses a polarographic system with rotating platinum electrodes to provide continuous online measurement of residual chlorine concentration. The unit uses microprocessors. Automatic sensor self-diagnostics (zero point, slope, response) can be taken with one-touch calibration.

The output range can be set in the field when the span is 1 mg/l or more. Remote switching two-range capability is available. A line-segment function is available for the output signal. Waterjet cleaning can be applied. The unit offers easy-to-clean cell construction and simple verification of applied voltage/current characteristics between electrodes. **800/888-6400; www.yokogawa.com. tpo**



NATIONAL ASSOCIATION OF WASTEWATER TRANSPORTERS, INC.



UPCOMING TRAINING & EVENTS

Inspector Training & Certification:
April 13, 2012 - Sonora, CA
 COWA - NAWT Re-Certification
 Instructors: Jacque Sommers and Kit Rosefield
 Go to www.COWA.org for registration

April 16-17, Tucson, AZ
 Univ. of AZ - NAWT Soils Class
 Contact: Kitt Farrell-Poe at (502) 621-7221

April 27-28, 2012 - Helena, MT
 Montana DEQ & NAWT
 Contact: Solid Waste Section at (406) 444-5300

August 27-28 - (TBA) Arizona
 Univ. Of AZ - NAWT
 Contact: Kitt Farrell-Poe at (502) 621-7221

Installer Workshops
June 26, 2012 - San Diego, CA
 Re-Certification
 Installation of OWTS - NEHA 2012 AEP
 Instructors: Jim Anderson and Dave Gustafson

Operation & Maintenance Training Certification:
1-Hour Online Operation & Maintenance
 April 9-10, 2012
 More information to come. Email: info@nawt.org

September, 2012 - (TBA) California
 Operation & Maintenance, Level 1
 Instructors: Mike Treinen or Kit Rosefield
 Go to www.COWA.org

November, 2012 - (TBA) California
 Operation & Maintenance, Level 2
 Instructors: Nick Weigel or Kit Rosefield
 Go to www.COWA.org

WATCH THE NAWT WEBSITE AND INDUSTRY MAGAZINES FOR UPDATES

FOR MORE INFORMATION CALL

800-236-6298

WWW.NAWT.ORG YOUR SOURCE FOR REAL LEARNING

Atlas Copco acquires Houston Service Industries

Atlas Copco North America LLC acquired Houston Service Industries Inc., a U.S. manufacturer of low-pressure blowers and vacuum pumps.

Godwin raffle benefits military family group

Godwin employees held a raffle, raising \$4,595 for the National Military Family Association that will send eight children to Operation Purple summer camp.

NEFCO names VP of engineering, business development

NEFCO (New England Fertilizer Co.), a Massachusetts-based biosolids processing company, named Larry Bishop, P.E., vice president of engineering and business development. Bishop has 20 years experience in the design, construction and operation of treatment and biosolids management and environmental facilities, including liquid sludge conveyance, dewatering and thermal drying processes.



Larry Bishop

American Water expands water, sewer line programs

American Water Works Co. Inc., a publicly traded U.S. water and wastewater utility, expanded its Water and Sewer Line Protection Program to homeowners in Georgia, Kansas, North Carolina and Texas. The program provides homeowners with comprehensive protection for water line and sewer line repairs that are not covered by homeowners' insurance or their water or sewer service provider.

WWEMA names LaVelle chairman

The Water and Wastewater Equipment Manufacturer's Association (WWEMA) board of directors elected Deborah LaVelle chairman for 2012. LaVelle is the first woman to serve as chairman in the organization's 103-year history. She is vice president of marketing and application engineering for Aqua-Aerobic Systems Inc.



Deborah LaVelle

Warren Rupp appoints Johnston VP of sales

Warren Rupp Inc. named Dan Johnston vice president of global sales. He replaces Scott Aiello who was named Warren Rupp's general manager of parts and sales.

Koch Membrane launches website

Koch Membrane Systems Inc.'s new website, www.kochmembrane.com, focuses on the company's two major business segments: industrial and life sciences, and water and wastewater.

Van London – pHOenix appoints product specialist

The Van London – pHOenix Co. named Tim Schilz director of analytical business development/Knick product specialist.



Tim Schilz

Pump Solutions Group acquires Quattroflow

Pump Solutions Group acquired Quattroflow Fluid System GmbH & Co. KG of Germany. Quattroflow manufactures positive displacement pumps that incorporate a four piston-technology with no mechanical seals, driven by an eccentric shaft and motor.

Hach names Brown corporate accounts manager

Dave Brown joined the Hach Flow team as corporate accounts manager. His experience includes business development, management and customer support. **tpo**



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Joni Emrick
An Original Environmentalist

WATER RESOURCE MANAGER
Kalispell (Mont.) Wastewater Treatment Plant

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Flow monitor provides accurate reports

Problem

Dry-weather influent at the 4 mgd Sandy Beach Treatment Plant on Oahu, Hawaii, fluctuated from 0.2 to 10 mgd with velocity from less than 0.10 to 3.5 feet per second. Flow monitors just downstream from a rectangular channel feeding a 36-inch concrete pipe produced unreliable readings, resulting in excessive explanatory reporting to the state Department of Health.

Solution

The plant superintendent looked for a reliable unit that would require little operator attention, integrate with the SCADA system, and trigger the wastewater sampler on accurate flow-weighted intervals to meet regulatory obligations. Plant staff did comparative testing that included a **FlowShark Pulse cross correlation flow monitor from ADS Environmental Services**.

RESULT

“The FlowShark Pulse provided stable data even during low-flow periods,” says Robert Cuevas, operations manager. “For the first time, our influent flowmeter tracked our effluent flowmeter so well that we couldn’t believe our eyes. This will make my life much easier when it comes to future reports.” 800/633-7246; www.adsenv.com.



Alarm monitors use cell phone interface

Problem

Douglasville-Douglas County (Ga.) Water and Sewer Authority needed a backup for the SCADA system at two 3 mgd treatment facilities. They searched for alarm monitors that were affordable, easy to use, and had the necessary functionality.

Solution

Officials bought nine **Viper Kits from OmniSite** with five universal voltage inputs, one analog option, NEMA 4X enclosure with locking hasp, a pre-connected wiring harness, and two current switches. Installation hardware, access key, high-level float, and conduit with fitting were included. Configuration changes, sent over the cellular network, are backed up with alarm notifications via text SMS messages.

RESULT

The equipment monitors floats, relays, and pump-run alarms. “Installation was easy and the quality is very good,” says supervisor Charles Butts. 317/885-6330; www.omnisite.com.



Plug-and-play gas sensors cut changeout time

Problem

Every year, operators at a 30 mgd wastewater treatment plant in Minneapolis, Minn., changed out multiple gas detector sensors. Swapping each unit took almost 30 minutes, plus time to check and calibrate them.

Solution

Looking for alternatives, the staff selected **SEC 3000 sensor modules and SEC 3100 universal transmitters from Sensor Electronics Corp.** that take less than two minutes per unit to change out. The sensors, factory-calibrated for hydrogen sulfide, methane, chlorine, sulfur dioxide and 20 more gases, plug into the gas detector, then automatically upload operating parameters and calibration settings to the control board in the module. The control board also enables operators to change easily to a different gas sensor.

A backlit digital liquid crystal display on the transmitter shows gas concentrations, while LEDs change from green to amber to red as levels increase. An isolated RS485 Modbus interface provides reliable communication in noisy environments and eliminates ground loop problems.

RESULT

Changing sensors now takes a little more than two man-days per year, helping the plant reduce labor costs and stay within budget. 800/285-3651; www.sensorelectronics.com.



Software modernizes treatment plant

Problem

One of Austria's largest wastewater treatment plants needed to upgrade its control system while in operation and against a tight deadline.

Solution

Vienna-based Internationale Automationsysteme (IAS) upgraded more than 30 pump stations by replacing star delta starters and contactors with **Allen-Bradley control and display systems from Rockwell Automation**. Besides soft starters and components, IAS equipped each station with PanelView Plus 400 displays and wireless modems to monitor assets and energy use remotely.

ControlLogix controllers managed process control while visualization operated with FactoryTalk View SE software and restructured three-tiered network architecture. Using a virtual private network, IAS engineers can access the system from anywhere in the world to help operators troubleshoot errors.

RESULT

The project, completed in 18 months, allows for future expansion and changes to the system. 414/382-2000; www.rockwellautomation.com.



Telemetry panels integrate with SCADA systems

Problem

The Cow Creek Band of the Umpqua Tribe in Canyonville, Ore., owns the Seven Feathers casino, hotels, a recreational vehicle park, and other businesses. As the facilities expanded, the tribe needed monitoring equipment for its water, graywater, and wastewater treatment systems.

Solution

Engineers at **Orenco Controls designed seven custom TeleComm (TCOM) Affordable SCADA control panels** programmed for peer-to-peer networking via a fiber and Ethernet network with operator control and monitoring via TELNET. Once the expansion was completed, the panels were reprogrammed to work with a SCADA system using RSView software from Allen Bradley. No new hardware was required.

RESULT

The panels communicate seamlessly with various programmable logic controllers and other devices under RSView supervision. 877/488-3594; www.orenco.com/controls. tpo



case studies

PUMPS

By Scottie Dayton

NOTE: This is a corrected version of a Case Study that appeared in the March issue of TPO.

System solves accuracy drift

Problem

The Bethpage (N.Y.) Water District metered caustic soda with diaphragm pumps, but accuracy drifted between maintenance periods and the check valves needed routine service.

Solution

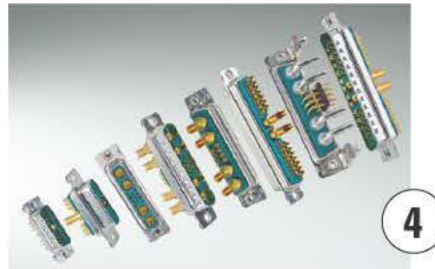
The district replaced the pumps with the **CTS Valveless Piston Pump system from Fluid Metering**. The only moving part, a rotating and reciprocating ceramic piston, controls all fluid functions. The sapphire-hard ceramic internals provide drift-free accuracy of better than 1 percent for millions of cycles without recalibration.



CTS Valveless Piston Pump system from Fluid Metering.

RESULT

Downtime was almost eliminated. The system uses less power and has a smaller footprint than the original pumps. 800/223-3388; www.fmipump.com. tpo



1. RUSSELECTRIC CIRCUIT BREAKER-TYPE SWITCHES

Medium voltage (5-15 kV) circuit breaker-type switches from Russelectric transfer loads between normal and emergency power sources and can be configured for open- or closed-transition transfer. All switch functions are controlled by the RPTCS programmable microprocessor-based control system. Designed for unattended operation, the switches include controls for manual operation. UL tested, listed and labeled under UL 1008A, the switches are approved for legally required emergency power systems and meet or exceed IEEE, NEMA and ANSI standards. 781/749-6000; www.russelectric.com.

2. SIEMENS RADAR LEVEL TRANSMITTER

The Sitrans LR250 radar level transmitter from Siemens' Industry Automation Division features a threaded PVDF (polyvinylidene fluoride) antenna for liquid and slurry measurement. Able to withstand corrosive chemicals, the antenna is available with Hart, Profibus PA or Foundation Fieldbus protocols. Applications include bulk liquid storage tanks, process vessels with agitators, vaporous liquids and low dielectric media. 973/222-8367; www.usa.siemens.com/level.

3. KEE ROOF HATCH RAILING SYSTEM

The KeeHatch roof hatch railing system from Kee Safety Inc. is designed to fit all standard models of roof hatches (Bilco, Babcock, Davis, Nystrom) and can be installed by one person in 30 minutes. Railings affix to the hatch and do not penetrate the roof. Made of high-grade aluminum silicon magnesium alloy for strength and corrosion resistance, the railing complies with OSHA 29 CFR 1910.23 and OSHA 29 CFR 1910.27 requirements. Available in seven models, the railing system integrates with existing openings and ladder ways. 800/851-5181; www.keesafety.com.

4. CONEC HIGH-DENSITY MIXED LAYOUT CONNECTORS

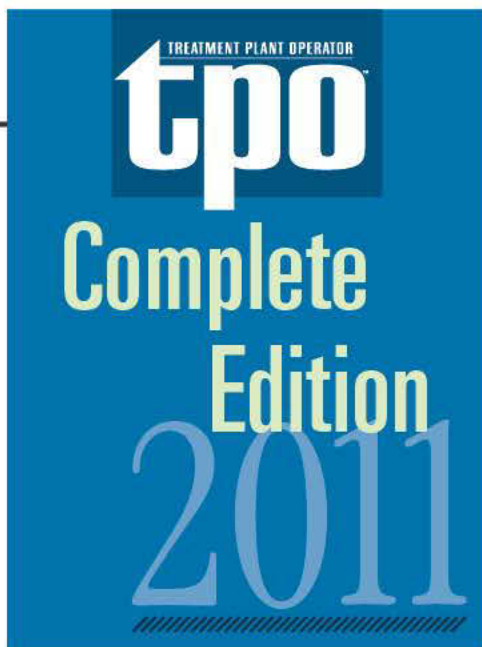
High-density (size 22) mixed layout connectors (19W1, 15W4 and 45W2) from CONEC are available in straight solder pin and solder cup versions. Signal contacts handle up to 3 amps at 60 volts. The power contacts are rated from 10 amps to 40 amps. Coax contacts are available in 50 and 75 ohm versions. Insulator material is UL 94 V-0 rated paired with tin-plated steel housings; other housing materials available. 919/460-8800; www.conec.com.

5. SUBSURFACE SUPPLY INDUSTRIAL VACUUM SYSTEM

The IVAC PV500 sand, sump, rock, slurry and water handling industrial vacuum system from Subsurface Supply Inc. is capable of moving materials in industrial and environmental cleanups. The skid-mounted unit weighs 1,800 pounds, is 72 inches long, 36 inches wide and 74 inches high. The system delivers up to 100 psi, 500 cfm and 25 inches Hg. Discharge pressure is fully adjustable (1-100 psi). It has a vertical vacuum lift up to 150 feet, vertical discharge up to 500 feet and horizontal vacuum of 500 feet, horizontal discharge up to 10,000 feet. The control panel can be powered by a 12-volt DC or an intrinsically SAFE option is available for hazardous environments. 605/838-8384; www.subsurfacesupply.com. **tpo**

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Treatment Plant Operator magazine is written solely for professionals who manage and operate municipal wastewater treatment facilities.

product spotlight

Sludge Pumps Offer Solids, Slurry Handling Options

By Ed Wodalski

Flygt 2600 sludge pumps from Xylem

Flygt 2600 sludge pumps from Xylem (spun off from ITT Corp. in October), are capable of flows to 450 gpm and heads to 128 feet. The wear-resistant pumps can handle up to 3.2-inch solids and sand concentrations of about 20 percent by weight. Applications include pretreatment sand trap pumping, digester cleaning, and temporary sewage pumping.

Features include the Hard-Iron (60 HRC) vortex impeller and polyurethane-lined housing for extended service life, Plug-In single-cartridge double mechanical seal, external oil and inspection plugs, and watertight terminal board. A removable top provides access to electrical components, while an air valve releases air pockets from the cooling jacket. An adjustable side discharge allows for larger solids passage and vertical or horizontal discharge.

"The key differentiator of the 2600 sludge series is their versatility," says Peter Hansen, product manager. "They are particularly useful for pumping larger solids, mostly at temporary installations or in maintenance situations." Available in three models (2620.280, 2630.280, 2640.280), the portable dewatering pumps weigh 75 to 123 pounds. Options include manual and automatic starters, outlets for side discharge hose or threaded connections, and SUBCAB submersible cable.

The 2620 50 Hz models have a 1.5 kW single-phase/2.2 kW three-phase motor and can handle solids up to 50 mm. The 2630 has a 3.2 kW motor and can handle solids up to 80 mm, and the 2640 has a 5.6 kW motor and can handle solids up to 46 mm. The 2620 60 Hz models have a 1.8 kW single-phase/2.6 kW three-phase motor and can handle solids up to 50 mm. The 2630 has a 4.5 kW motor and can handle solids up to 80 mm, and the 2640 has a 9.6 kW motor and can handle solids up to 46 mm.

Accessories include level regulators that control pump operation or actuate an alarm, pump raft that keeps the pump afloat, zinc anode kits for extra corrosion protection, pump integrated memory (PIM) that records pump performance and service-related information, and the FPC 100 pump control system that automatically monitors and controls the pump without the use of level sensors. The pumps can be rented for once-off projects, such as emergencies or plant maintenance, reducing costs during tight budgetary times. 856/467-3636; www.xyleminc.com.



VISITORS



Stopping Over

By Briana Jones

As hunting season ended last January, ducks and geese began making pit stops on their way south at the City of Quincy (Ill.) Water Pollution Control Facility. "They feel safe," says pretreatment coordinator Dan Ebbing, an employee of American Water Enterprises, which operates the 15 mgd (average) activated sludge plant.

A cold climate doesn't leave much open water, but ducks and geese found some at the plant. "We sit on the Mississippi River, so we're right in the fly zone," says Ebbing. "We have a large pond on the property that attracts them. When that's frozen over they land in the final clarifiers."

Ducks are regular visitors on the grounds, but Canada geese were new this year. "The clarifiers aren't large enough, so geese can't get enough momentum to fly out of the basins," says Ebbing. "One day was really windy though, so they were landing like helicopters." To escape, "They hovered straight up and then got going."

Seeing wildlife on the grounds is fun for most plant staff members. But for chief operator and avid waterfowl hunter Greg Frieden, it's more like a temptation. "He goes crazy seeing the ducks and geese around here," says Ebbing. "I tell him, 'They're just teasing you by coming here.'" **tpo**

Show us your visitors

TPO invites you to show us the wild creatures that visit your plant property. Mammals, birds, reptiles, amphibians — send a picture or two and a brief description of when and where the visitor appeared to editor@tpomag.com.



Los Angeles looks at \$88.6 million upgrade

The City of Los Angeles has awarded Honeywell a 15-year, \$88.6 million contract to overhaul the technology controlling its wastewater treatment system. The project will allow the city Bureau of Sanitation to replace the current control systems, some of which have been in place for two decades.

It will also enable the city to create a city- and network-wide integrated operation, simplifying how it operates and maintains the wastewater system and reducing environmental risks from aging infrastructure. The system capacity is 550 mgd and includes 6,700 miles of sewer lines that serve more than 4 million residential and commercial customers in Los Angeles and 29 other cities.

The Honeywell technology will allow the city to link its four main treatment plants with geographically dispersed pumping stations, enabling operators to control the entire system from a central location. It will enable the city to more effectively monitor pumping stations and collection facilities across a 500-square-mile service area.

The project will take seven years to complete, and Honeywell will provide support services for eight years after completion. "This overhaul will give us better effectiveness and efficiency to meet the city's needs and improve its overall infrastructure for decades to come," said Varouj Abkian, assistant director of the Bureau of Sanitation. "In addition, over the next decade we expect it to save tens of millions of dollars and generate much-needed high-paying jobs for our community."

Besides streamlining wastewater operations, the company's Experion Process Knowledge System (PKS) platform will reduce training requirements for department employees. A single-platform approach means operators only need to learn one system.

Miami Dade adds treatment capacity

WesTech Engineering has helped increase the treatment capacity at the Miami Dade (Fla.) South District Wastewater Treatment Plant by 60 mgd. The company supplied four new 195-foot-diameter clarifiers and retrofitted six more with the Clarifier Optimization Package (COP) design. All 10 clarifiers are now online.

Located in Miami, South District had a peak flow capacity of 225 mgd. The new clarifiers are part of an expansion that will increase peak flow capacity to 285 mgd to meet increased demand caused by regulatory requirements and population growth.

Stricter regulations require effluent from treatment plants to be upgraded to protect existing aquifers. The COP clarifier design offers capacity and efficiency improvements over conventional clarifiers.

"We have found that the COP clarifiers perform better than our old standard rake/no EDI style of clarifiers," said Steve Kronheim, chief plant operator at Miami Dade. "Also, we are excited to see how the Dual-Gate EDI will perform at peak conditions as compared to the conventional scooped EDI. The incorporation of the spiral-bladed collection mechanism appears to provide a thicker underflow than delivered by our previous clarifiers."

"In the past, our RAS concentration was 7,000 to 9,000 mg/L, and now it is 9,000 to 11,000 mg/L. This saves us 20 to 30 percent on our RAS pumping and increases the capacity of our solids processing facility."

Princeton, Minn., adds Hydrotech Discfilter

Kruger Inc., a Veolia Water Solutions & Technologies company, will furnish a 3.9 mgd Hydrotech Discfilter system for a wastewater treatment plant improvement project in Princeton, Minn. Two units will be installed for tertiary filtration to meet stringent total phosphorus limits for discharge to the Rum River. The system is to be operational in fall 2012.

Florida utilities select BioAir Solutions for odor control

Three municipal utilities in Florida have selected BioAir Solutions to supply technologies to remove odors from wastewater treatment facilities.

The City of Atlantic Beach chose the EcoPure unit to treat hydrogen sulfide and organic odors from a dewatering building. The unit combines the benefits of biotrickling filter technology with EcoSorb media for polishing.

Orange County Utilities will install a similar, smaller EcoPure unit at its Hunters Creek Pump Station in Orlando. The unit will draw odorous air from the pump station and maintain a slight vacuum in the headspace and gravity sewer upstream, so that no fugitive odors are released. The low-profile unit will be invisible to the community.

Pinellas County installed a pair of EcoPure Mini units to control odors at two wastewater pumping stations in Madera Beach. The installations are on a barrier island in the Gulf of Mexico near high-end homes. The units maintain a slight negative pressure in wet well headspace to avoid escape of fugitive odors.

The BioAir systems are designed to remove more than 99.9 percent of the hydrogen sulfide and reduce overall odors by more than 95 percent.

Cincinnati adopts FlowWorks to manage environmental data

The City of Cincinnati will move its environmental monitoring data onto the FlowWorks Web platform for secure storage, editing and analysis.

ADS and FlowWorks are partnering to provide the city with flow services for capital improvement and other modeling projects. Included are flow servicing, data management and QA/QC for more than 200 monitoring stations. The data is being uploaded to FlowWorks, where it will be combined with other environmental data, including historic data from flow metering stations, rain gauges and SCADA pump stations, and from CSO and SSO sites. **tpo**

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EDUCATION

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MISCELLANEOUS

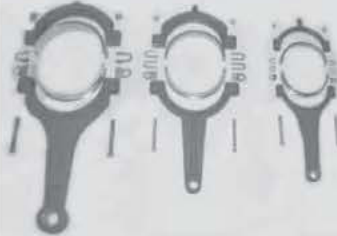
UV DISINFECTION EQUIPMENT: Attention: Small wastewater treatment plant owners and operators. Very easy installation. Brand new product. US patent pending. callagher@sbcglobal.net, www.thefecalfighter.com. (oBM)

WANTED

Two positions available with the City of KCMO's Water Services Department. Oversees the operation of 6 wastewater treatment plants, 55 pump stations, and the operation of all Water Treatment functions, including the operation of the City's main Water Treatment Plant, Atherton Water Treatment Plant, and all satellite pumping stations throughout the city. Responsible for all management functions including but not limited to operations, employee selection, disciplinary actions, budget preparation, and environmental

regulations. Must be familiar with NPDES permit application, negotiation, and interpretation. Expected to be available 24/7 and assist as a member of the Emergency Response/First Responder Team, which requires participation in taking stress tests, hearing exams, breathing exams, eye exams, and blood work. Requires 4 years of progressively responsible experience as a registered engineer. Must be registered as a professional engineer with the Missouri Board of Professional Architects, Engineers, and Land Surveyors within 6 months of hire date. Preference given to candidates with supervisory experience working in a water/wastewater treatment plant, thorough knowledge of current Water/Wastewater Treatment processes, and strong computer skills. For Water Supply, must obtain Water Operator Certification and Distribution Operator Certification through the Missouri Department of Natural Resources within 1 year of hire date. For Wastewater, must obtain Wastewater Operator Certification through the Missouri Department of Natural Resources within 1 year of hire date. Salary Range: \$4,848-\$8,240/month. Applications accepted until positions filled. Apply online at www.kcmo.org. EOE. The City of Kansas City, Missouri is an equal opportunity employer committed to a diverse workforce. (o04)

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The screenshot shows the tpo website interface. At the top, there's a navigation bar with 'NEW EQUIPMENT', 'CLASSIFIEDS', 'ARTICLES', 'ADVERTISING', 'INTERACT', and 'SUBSCRIBE'. Below that, there are several featured articles and advertisements. A red arrow points from the text 'Submit your classified ad now!' to the 'CLASSIFIEDS' tab in the navigation bar.

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people/awards

The **Florida Department of Environmental Protection** announced the following Domestic Wastewater Treatment Plant Award winners for 2011:

- City of Clermont, East Wastewater Treatment Facility
- Hurlburt Field Air Force Base Advanced Wastewater Treatment Facility
- Live Oak Wastewater Treatment Facility
- City of New Port Richey Wastewater Treatment Facility
- Fort Myers Beach Wastewater Treatment Facility
- Loxahatchee River District Wastewater Treatment Plant
- San Carlos Park Wastewater Treatment Plant
- Polk County Northwest Regional Wastewater Treatment Facility
- Cypress Bend Wastewater Treatment Facility
- Oakhill Village Mobile Home Park Wastewater Treatment Facility

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

education

Canada

The Maritime Provinces Water & Wastewater Association will hold its annual seminar, "The Earth Is Our Island: How We Protect It," in Charlotte-town, Prince Edward Island, April 22-25. Visit www.mpwwa.ca.

New York

The New York Water Environment Association has these courses:

- April 3-May 5 – Basic Wastewater (10 sessions), Stone Ridge
 - May 8-June 5 – Activated Sludge (9 sessions), Stone Ridge
- Visit www.nywea.org.

Ohio

The Ohio Water Environment Association has these courses:

- April 5 – Watershed Workshop, Columbus
 - May 10 – Collection Systems Workshop, Lewis Center
- Visit www.ohiowea.org.

Texas

The Water Environment Association of Texas has a Laboratory Topics Seminar June 6-7 in Austin. Visit www.weat.org.

Wisconsin

The Central States Water Environment Association offers these courses:

- April 2 – Young Professional Leadership Academy, Madison
 - April 3 – Education, Madison
- Visit www.cswea.org.

The Wisconsin Department of Natural Resources is offering these courses:

- April 11 – Wastewater Math, Chippewa Falls
 - April 16-17 – Activated Sludge-Introduction, Madison
 - April 18-19 – Activated Sludge-Advanced, Madison
 - April 23-24 – Phosphorus Removal-Introduction and Advanced, Madison
 - April 25-26 – Lab-Advanced, Madison
 - June 6 – Customer Service, Richfield
 - June 7 – Classic Collection Systems, Watertown
- Visit www.dnr.state.wi.us.

The University of Wisconsin Department of Engineering-Professional Development has a Nutrient Removal Engineering: Phosphorus and Nitrogen in Wastewater Treatment seminar April 24-26 in Madison. Visit www.epdweb.engr.wisc.edu. **tpo**

CALENDAR OF EVENTS

April 10-13

Water Environment Association of Texas-Texas Water 2012, San Antonio. Visit www.weat.org.

April 15-17

North Carolina-American Water Works Association Annual Conference, Wilmington. Call 919/784-9030 or visit www.ncsafewater.org.

April 15-18

Alabama Water Environment Association Annual Conference and Technical program, Perdido Beach Resort, Orange Beach. Call 205/349-0067 or visit www.awea-al.com.

April 15-18

Water Environment Federation Odors and Air Pollutants 2012, Kentucky International Convention Center, Louisville. Call 703/684-2441 or visit www.wef.org.

April 16-19

Illinois Association of Water Pollution Control Operators Annual Conference, Crowne Plaza Convention Center, Springfield. Call 815/303-3745 or visit www.iawpco.org.

April 17-18

Georgia Association of Water Professionals Spring Conference and Expo, Columbus. Visit www.gawp.org.

April 17-20

California Water Environment Association Annual Conference, Sacramento Convention Center. Visit www.cwea.org.

April 17-20

Water Environment Association of Utah Annual Conference, Dixie Center, St. George. Visit www.weau.org.

April 21-25

British Columbia Water & Waste Association Annual Conference, Penticton Trade and Convention Centre. Call 604/433-4389 or visit www.bcwwa.org.

April 22-24

Water Environment Association of Ontario Technical Symposium and Exhibition, The Ottawa Convention Centre. Call 416/410-6933 or visit www.weao.org.

April 24-25

Nevada Water Environment Association Annual Conference, John Ascuaga's Nugget, Sparks. Visit www.nvwea.org.

April 29-May 2

Arkansas Water Works & Water Environment Association Annual Conference, location to be announced. Visit www.awwwwa.org.

May 1-3

Montana Water Environment Association and Montana Section of

the American Water Works Association Joint Conference, Holiday Inn Grand, Billings. Call 406/546-5496 or visit www.montana-awwa.org.

May 7-11

Alaska Water Wastewater Management Association Annual Conference, Westmark Hotel & Convention Center, Fairbanks. Call 800/544-0970 or visit www.awwma.org.

May 13-18

New Jersey Water Environment Association Annual Conference, Bally's Atlantic City. Call 201/296-0021 or visit www.njwea.org.

May 20-23

West Virginia Water Environment Association Annual Conference, Grand Pointe Conference and Reception Center, Parkersburg. Visit www.wv-wea.org.

May 21-22

Louisiana Water Environment Association Spring Conference, Lindys Bogs Conference Center, New Orleans. Visit www.lweaonline.org.

June 3-6

New England Water Environment Association Spring Conference, Newport Marriott, Newport, R.I. Visit www.newea.org.

June 3-6

Pennsylvania Water Environment Association Annual Technical Conference and Exhibition, Penn Stater Conference Center and Hotel, State College. Call 570/549-2204 or visit www.pwea.org.

June 3-6

Water Environment Federation Collection Systems 2012: "Show Me The Green – Confluence of Planning, Implementation and Regulations," St. Louis Convention Center, St. Louis, Mo. Call 703/684-2441 or visit www.wef.org.

June 4-6

New York Water Environment Association Spring Conference and Exhibition, Hyatt Downtown, Buffalo. Call 315/422-7811 or visit www.nywea.org.

June 5-8

Mississippi Water Environment Association Annual Conference, Hollywood Casino Meeting Center, Bay St. Louis. Visit www.mswea.org.

June 19-21

Ohio Water Environment Association Annual Conference, Bertram Inn and Conference Center, Aurora. Call 440/829-8405 or visit www.ohiowea.org.

June 24-27

Michigan Water Environment Association Annual Conference, Boyne Mountain Resort, Boyne Falls. Visit www.mi-wea.org.

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