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OCTOBER 2013

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in New York City

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Reliability Manager
Portland, Maine

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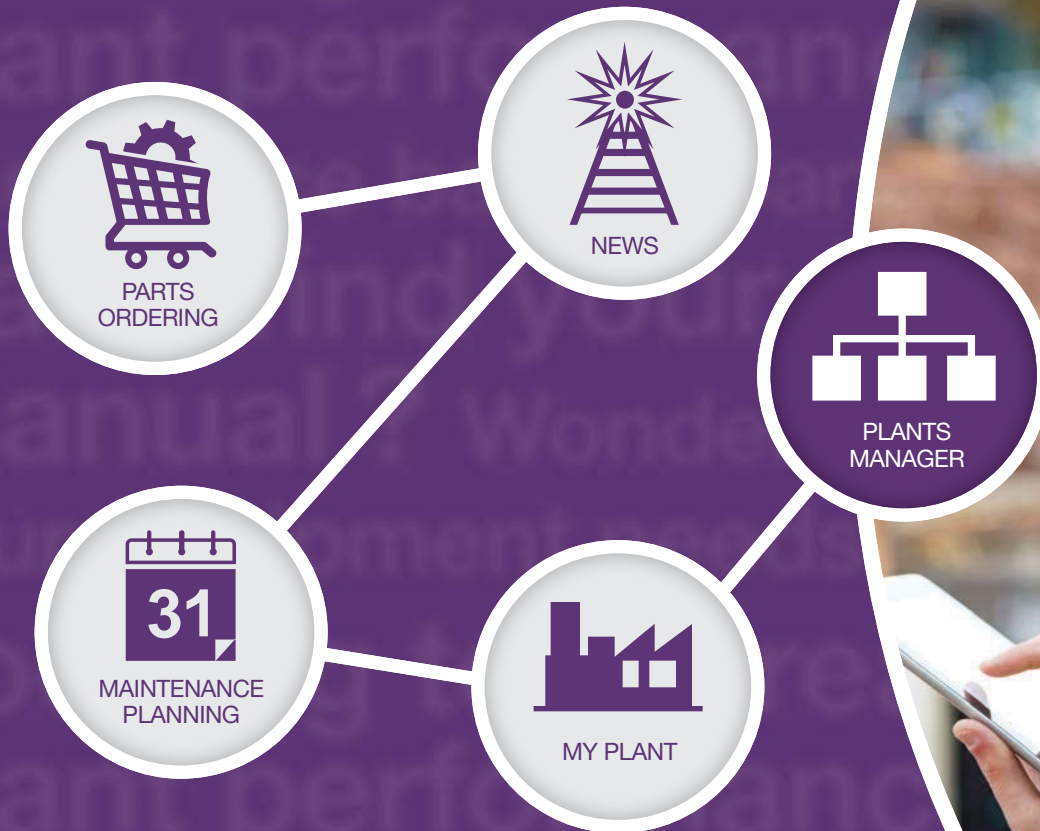
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Rich Hunt's multiple degrees and certifications come in handy for his role as reliability manager and field operations and maintenance specialist with Woodard & Curran, serving clean-water plants in the Northeast and other regions of the United States. (Photography by Ed Collier)

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Building a Bridge

WASTEWATER TREATMENT TRAINING PROGRAMS ARE COMMON IN PRISONS. WHAT HAPPENS TO THE TRAINEES WHEN THEY ARE RELEASED AND LOOK FOR WORK IN THE CLEAN-WATER FIELD?

By Ted J. Rulseh, Editor



Imagine you're in charge of hiring a new operator for your clean-water plant. Your choice comes down to two applicants. Both have the necessary licensing. They have similar schooling and the work experience you require. The only obvious difference is: One of them is fresh out of prison.

Which one would you hire? Maybe the answer is obvious — but should it be? Are former inmates a potential pool of talent for an industry that's badly in need of new blood? I know, this sounds radical, but stay with me for a while.

BEYOND THE WALLS

TPO magazine finds its way into a number of prisons that have their own wastewater treatment plants and run training programs for operators. I know this because

I get letters from inmates, more often than you imagine, thanking the magazine staff for the information we provide — because given their confinement, information is hard to get.

The prison-based training programs tend to be quite extensive and prepare the participants well for careers. I've had several letters from inmates saying their clean-water training has helped redirect their energies and motivate them toward productive lives. But they worry about whether they'll be able to find work after serving their sentences. As in just about any profession you care to name, who hires an ex-con?

Suspicion of people who have been to prison for felonies is understandable, especially when there are always applicants who have not “done time.” But what about the concept that a person who committed a crime and then served out a sentence deserves a fair shake and a fresh start? I'll let a recent inmate clean-water trainee make the case, because he did so better than I could.

OPENING DOORS

“I know of multiple fellow inmates who have seized this opportunity to secure the prospects of the future in this industry,” wrote

James Blackford, now at Martin County (Fla.) Correctional Institution. “This program opens doors for a vast array of industry that branches off the standard water and wastewater operations. From mechanical equipment maintenance to the repair of sophisticated electrical instruments, these avenues provide a variety of career choices for those who aspire to more than operations.

“I myself am about 100 hours away from becoming a licensed C wastewater operator, and I passed my C water exam in February. I am preparing for my release and have plans to pursue a career in wastewater and water operations. The transition will be a challenge, but challenge gives room for growth.

“I, like many other inmates, have made amends for past decisions and have chosen to be a responsible, productive member of society. But even though we have paid our debts to society, we are constantly haunted by the stigma of being felons.

FRESH START?

“That critical question on job applications that asks, ‘Have you ever been convicted of a felony?’ produces a tremendous disadvantage for those of us who want to leave the past behind. I personally

“I, like many other inmates, have made amends for past decisions and have chosen to be a responsible, productive member of society. But even though we have paid our debts to society, we are constantly haunted by the stigma of being felons.”

JAMES BLACKFORD

feel that question is a prejudice that needs to be addressed in order to give ex-offenders an equal opportunity in society. The question hinders growth for those who truly aspire to grow.”

How about you? Would you be willing to look beyond the answer to that question and give someone with a prison record, but with all other qualifications intact, a chance at least for an interview? Have you ever had to consider hiring a former inmate? Have you ever hired one? How did it work out?

Please share your opinions and your experiences along these lines if you have them. Send a note to editor@tpomag.com. I promise to respond, and we'll publish comments on the topic in a future issue. **tpo**

It's Not Just for the Guys

By Ted J. Rulseh

It's easy for the clean-water profession to overlook half the potential pool of future operators: women. But Kristen Meyers, P.E., and the team at the North Shore Sanitary District in Illinois aren't making that mistake.

The district recently took students from the Lake County (Ill.) YWCA TechGYRLS summer camp on a tour of the laboratory at the wastewater treatment facility in Gurnee.

The girls did everything from looking at vials of dragonfly nymphs that live in the effluent, to sniffing samples of biosolids cake. Such activities help further the aims of The Fire Chief Project:



- **Raise clean-water operators to the status of the fire chief**
- **Make kids grow up wanting to be clean-water operators**

TechGYRLS is a free program for Lake County girls age 7-14. They spend two weeks working in a variety of technology areas. "We publicize on our website and elsewhere that we allow tours of the treatment plant and our lab," says Meyers. "A representative of TechGYRLS contacted us and said they wanted to expose the girls to what we did at the lab. They asked if we had any female engineers on staff, which obviously I am."

During the tour, district personnel explained how plant effluent affects fish in the receiving stream, the Des Plaines River. The girls viewed an aquarium in the lobby where native fish swim in effluent. After the tour, Meyers spoke to the girls about careers in science, technology, engineering and math (STEM). She encouraged the girls to continue with STEM activities as they enter their middle school and high school.

"It was great to see them," says Meyers. "We encourage kids at that younger age to get involved in science. I think people typically gravitate toward what they are exposed to growing up. If they're not exposed to these careers, they're not going to think about exploring them."

"I talked to the girls about what we do here at the district in engineering, and I explained that almost everything they do in life has engineering and science behind it. Science isn't something scary. We deal with it every day and don't even realize it. I hope by knowing that, they'll become more comfortable with it and want to explore more science and math programs in the future."

"Even though wastewater isn't a glamorous field, it's such an important career in what it does for the public. We asked the girls to consider what it would be like if there were no wastewater treatment plants and no closed sewers. We would have ditches with sewage running in them and that's how diseases are borne. We tried to teach them about the technology that's underground and how it makes their lives better."

"A lot of women work in our lab, so they could see that this isn't an all-male field. There's no reason there shouldn't be more women in engineering, and especially in the wastewater field. We also stressed to them the importance of creativity. People tend to think there's not much creativity in math and science. But in reality, it's about problem solving – some of the best engineers are the most creative ones."

For more on The Fire Chief Project, visit the blog at www.tpomag.com

Send ideas for The Fire Chief Project to editor@tpomag.com



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Votes for including industrial operators

I was delighted to read your blog post concerning industrial wastewater treatment plant operators. Biological wastewater treatment is not that different, whether municipal or industrial. I have been in the wastewater field since 1974. I received my Pennsylvania license in 1976 and my New Jersey industrial license in 1982. I was inducted into the Water Environment Federation Quarter Century Operators Club in 2003. I still maintain both wastewater licenses.

The biological processes are the same, although the industrial wastewater may be a bit more potent. I operated a municipal 8.8 mgd Unox/trickling filter plant for four years and a high-strength carbohydrate waste (10,000 mg/L to 125,000 mg/L BOD) aerobic/anaerobic system for more than 20 years.

I am also a member of the New Jersey Water Environment Association (since 1982) and a member of the Industrial Environmental Quality Committee, where we present technical training seminars three times per year. Many municipal operators attend our sessions because the topics are relevant to municipal as well as industrial operators. Not to mention, they need the training hours for recertification of their licenses.

I would wholeheartedly support including articles about industrial wastewater treatment operations in *TPO* magazine.

Tom Eckhoff, CHMM, REM
Arrigetch Environmental Consulting
 Revere, Pa.

I have been receiving *TPO* magazine for a couple years now. It is interesting. I would definitely like to see more information on industrial wastewater treatment. I have been a wastewater treatment plant operator at a stainless steel mill in Kentucky for 22 years. The state does not have any certification specifically for industry, so industrial operators have gone to classes for municipal wastewater, which has nothing to do with our processes. They talk about BOD and MLVSS and such, and we deal with pH and polymers. Training new operators is difficult due to the lack of information on our field.

Forrest Poland
North American Stainless
 Ghent, Ky.

I just read your "Are We Missing Something?" discussion on whether to include industrial operators in *TPO*. My response is: absolutely! I have been in the environmental field since 1983, and for most of that time highly involved in the wastewater treatment arena. Now, 30 years later, with experience (in this order) as a regulator, environmental engineer in industry, and an engineer in municipal public works, I see tremendous areas of overlap between the industrial and municipal wastewater treatment arenas. I enjoy reading *TPO* every month, and I think it will become even better if you choose to include the industrial wastewater sector in your coverage.

Jim Parsons
Chief Deputy Director of Public Works
 Ocean City, Md.



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Published monthly by COLE Publishing, Inc.
 1720 Maple Lake Dam Rd., PO Box 220, Three Lakes, WI 54562

Call toll free 800-257-7222 / Outside of U.S. or Canada call 715-546-3346
 Mon.-Fri., 7:30 a.m.-5 p.m. CST

Website: www.tpomag.com / Email: info@tpomag.com / Fax: 715-546-3786

SUBSCRIPTION INFORMATION: A one year (12 issues) subscription to *TPO*™ in the United States and Canada is FREE to qualified subscribers. A qualified subscriber is any individual or company in the United States or Canada that partakes in the consulting, design, installation, manufacture, management or operation of wastewater treatment facilities. To subscribe, return the subscription card attached to each issue, visit tpomag.com or call 800-257-7222.

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

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EDITORIAL CORRESPONDENCE: Address to Editor, *TPO*, P.O. Box 220, Three Lakes, WI, 54562 or email editor@tpomag.com.

REPRINTS AND BACK ISSUES: Visit www.tpomag.com for options and pricing. To order reprints, call Jeff Lane at 800-257-7222 (715-546-3346) or email jeffl@colepublishing.com. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicolel@colepublishing.com.

CIRCULATION: 76,492 copies per month.

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RICH HUNT BRINGS A LONG LIST OF PROVEN CAPABILITIES TO HELP CLEAN-WATER PLANTS PRODUCE QUALITY EFFLUENT AND OPERATE RELIABLY, SAFELY AND COST-EFFECTIVELY

By Ted J. Rulseh

IF RICH HUNT WERE TO EMULATE A DOCTOR AND FRAME HIS DIPLOMAS for display on a wall, he would need a pretty big room.

Besides his associate degree in mechanical engineering from the University of Massachusetts — Lowell, he holds wastewater treatment plant and collection system operator licenses, master electrician and refrigeration licenses, plus a dozen or so certifications in predictive maintenance methods, hazardous materials and safety.

It all comes in quite handy in his role as reliability manager and field operations and maintenance specialist with Woodard & Curran, an engineering, science and facility operations firm based in Portland, Maine, serving clean-water plants in the Northeast and other regions of the United States.

Hunt spends much of his time traveling among the 43 facilities the company serves — he has been to 39 of them. While on site, he helps plant managers and operating teams with maintenance issues, troubleshooting, safety compliance and much more. As a jack of many trades, he provides in-house a host of services for which plants otherwise would have to hire separate contractors, at considerably higher cost.

Last year, Hunt's contributions earned him the Operator Safety Award from the New England Water Environment Association (NEWEA).

A VALUABLE PLAYER

Hunt's supervisor, Frank Cavaleri, a senior vice president in the company's Operations & Management Group, observes, "Rich is a unique guy. He has multiple certifications and skill sets that cover everything we do in our group. There are about 200 people in our operations business, and if we



Rich Hunt of Woodard & Curran at the Union Park Pump Station in Boston, Massachusetts. (Photography by Ed Collier)

were to take a vote on who is the most indispensable, I believe Rich would come out on top.

"He provides valuable safety guidance at the facilities we operate. His dedication and superb maintenance skills were essential in helping several facilities battle the lasting impacts of Hurricane Sandy. He was instrumental in keeping those facilities running reliably and safely in the face of many obstacles."

During 10 years with the firm, Hunt has assisted with health and safety compliance audits and in setting up lockout/tagout programs. He played a key role in developing and deploying the Woodard & Curran Electrical Safety Program and has acted as an electrical qualification instructor to more than 130 employees.

"He is extremely dedicated — one of those people you can call in the middle of the night to help out on a project," Cavaleri adds. "Another thing that really stands out is his constant desire to better himself and better the company."

LOVE OF MAINTENANCE

Hunt has been in industrial maintenance for 30 years, and along the way he never stopped learning. He started as a facilities technician for a test equipment manufacturer. Next, he was an HVAC/electrical lead technician for a computer company, then a facilities manager for a pressure transducer and scales manufacturer. In all those roles, covering 30 years, he was always involved one way or another with in-plant water or wastewater treatment systems. That made Woodard & Curran a good fit. "They had a need for an O&M specialist, with both maintenance and wastewater operations skills, and that's what I had," Hunt says.

His mission at first was to support the plant managers at all the company's contract operations projects, with an emphasis on the maintenance side.

profile

**Rich Hunt,
Woodard & Curran**

POSITION:
Reliability manager/field
operations and maintenance
specialist

EXPERIENCE:
10 years in role

EDUCATION:
Associate degree,
mechanical engineering,
University of Massachusetts
- Lowell

CERTIFICATIONS:
Multiple wastewater and
other trade and industry
licenses and certificates

RECOGNITIONS:
2012 Operator Safety Award,
NEWEA

GOALS:
Continue building new
knowledge and skills



The Union Park Pump Station is one of many sites where Rich Hunt has applied his expertise.



Hunt looks for an attachment point for vibration monitoring equipment. (The turbine shown was not operational at the time the picture was taken.)

WELL SCHOOLED

Rich Hunt acquired multiple licenses and certifications mainly through sheer determination to learn whatever skills he needed to be effective on the job. He learned the electrician trade through trade school and eventually earned his journeyman and master electrician licenses.

He picked up his associate degree in mechanical engineering through 13 years of night school at the University of Massachusetts — Lowell, where he also earned nearly enough credits for a civil engineering associate degree. Otherwise, “If I lacked something in knowledge, I tried to take the classes that would benefit me,” Hunt says. “Some of them led to certificates and licenses. When I need something, I go. Woodard & Curran needed a Competent Person in fall protection. The class came up, and I told my boss, Frank Cavaleri, that I was thinking of taking it.

“He gave me consent. He is really enlightened about education — he sees it as a benefit for the company. The more we know, the better off we are.”

Here is a list of Rich Hunt’s industry credentials:

LICENSES

- Massachusetts Wastewater Operator, Grade 5C
- New Hampshire Wastewater Operator, Grade 2
- Arizona Wastewater Treatment Plant Operator, Grade 3, and Wastewater Collection Systems Operator, Grade 4
- Massachusetts and NEWEA Certified Backflow Prevention Device Tester
- Massachusetts Journeyman Electrician
- Massachusetts and New Hampshire Master Electrician
- Massachusetts Refrigeration Technician

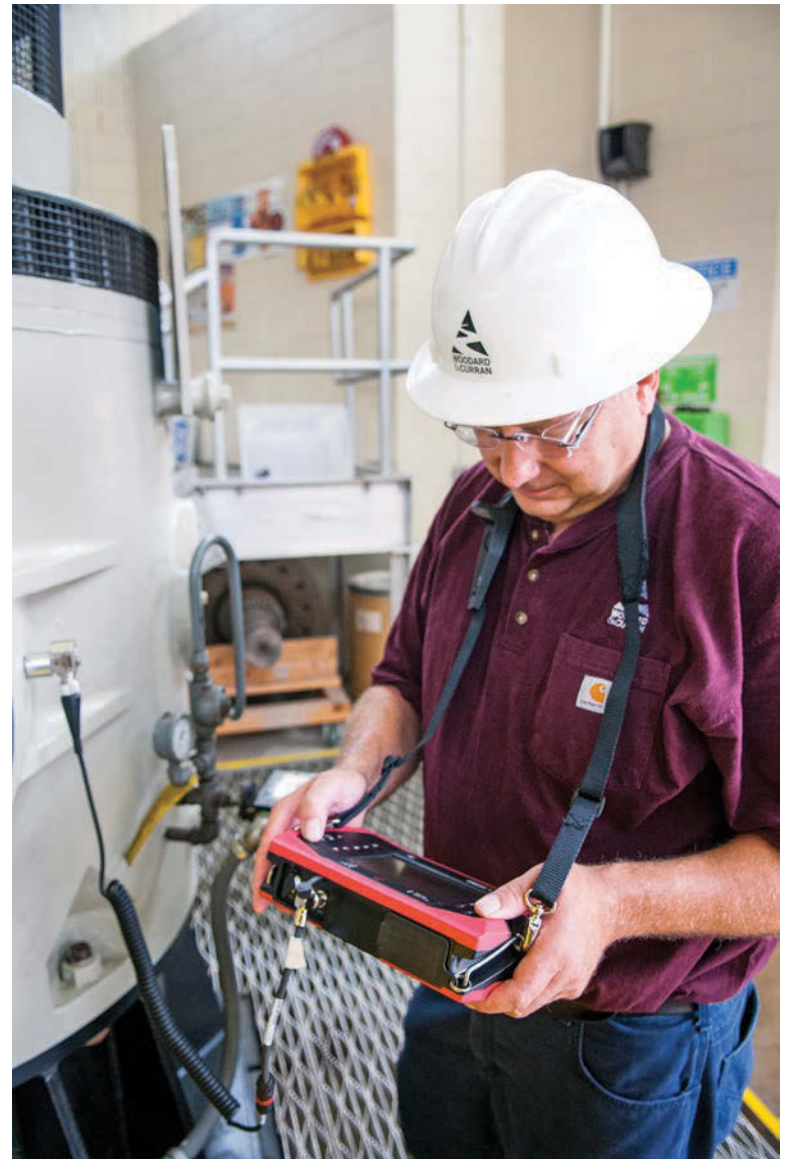
CERTIFICATIONS

- Level 2 Infrared Thermographer
- Level 2 Vibration Analyst
- Level 1 Ultrasound Inspector
- Level 2 Machinery Lubricant Analyst
- International Maintenance Institute Water and Wastewater Maintenance Technician
- NEWEA Wastewater Collection System Operator, Grade 4 Universal and Vehicle Refrigerant Transition and Recovery Technician
- 40-hour OSHA HAZWOPER training
- 10-hour OSHA construction safety
- Reliability Centered Maintenance (RCM) certified

OTHER

- Competent Person for fall protection devices (DBI/Sala)
- Commercial Driver’s License, Class B, air brake endorsement
- Forklift training instructor

“Instead of hiring contractors, we tried to do things in-house,” he says. “My role was to provide an expert opinion on how to complete specific projects. For example, if a facility team wanted to add a new control system, they would ask me to come in and evaluate it and give my opinion on which way to go.



Rich Hunt monitors equipment vibration readings using a portable analyzer (Commtest). The technique helps detect anomalies early so that equipment failures can be prevented.

“A lot of people will tend to grease things twice a year whether it needed it or not. The reality is that too much lubrication is usually more detrimental to equipment than too little.”

RICH HUNT

“Every project has a technical support budget. The plant managers have an allotment of money they can use to engage expert help, whether it’s Woodard & Curran resources or local contractors. The benefit to bringing me in is that I can do more than just one thing, whereas if they hire a contractor it’s usually just for one specific task.”

In time, Hunt’s focus shifted to predictive rather than traditional preventive maintenance. “The company was growing, and we saw a distinct need not just to perform maintenance but to be smarter about using the latest tools to analyze equipment,” Hunt says.

KEEPING IT SAFE

When taking on a new facility, Woodard & Curran typically performs main-

tenance, operations and safety audits to determine where improvements are needed. Hunt soon became deeply involved in safety audits, working with Shannon Eyer, corporate O&M Group safety manager.

The two soon discovered benefits simply in looking at a facility with two sets of eyes: "Even things you would normally pick up, when you're looking at the same things over and over, you can be blinded sometimes. When we walk into a plant, we basically split off in different directions, and once in a while we meet in the middle."

"I write my reports and give them to her. Sometimes we end up writing the exact same things down. She finalizes the reports, and then we present them to the project team with recommended corrective actions. It works out well, because the second time we audit a facility, we don't see the same little issues."

Electrical safety took on special importance when the National Fire Protection Association issued a new standard covering arc flash safety. (Arc flash is a hazardous and potentially lethal event in which a short circuit flashes through air from one live electrical conductor to another, or to ground.)

The electrical safety program developed by Woodard & Curran includes arc flash analysis and protection. It trains plant operators who are not licensed electricians, but do electrical troubleshooting and repair, to become qualified electrical workers. The program includes classroom presentations and testing along with hands-on work. It covers topics such as wearing the appropriate personal protective equipment and using the proper tools to work safely on electrical systems. Prerequisites include first aid and CPR instruction.

KEEPING THEM RUNNING

While assuming more safety duties, Hunt has worked to take maintenance on Woodard & Curran sites to a new level. That means traditional maintenance based on ownership manuals and schedules is no longer good enough. "Your car manufacturer may say to change the oil every 3,000 miles or three months," says Hunt. "But if the oil is still good, why keep changing it just to change it? Let's go above and beyond."

Much of his work involves coaxing people out of old habits: "A perfect example is greasing equipment. A lot of people will tend to grease things twice a year whether it needed it or not. The reality is that too much lubrication is usually more detrimental to equipment than too little. I try to bring the philosophy that you should test equipment to find out if it needs the lubrication before you put it in."

A useful tool is machinery oil and coolant analysis. Using that effectively means not just sending samples to a lab but drawing samples properly and from the correct sources: "If you take it from the wrong location, the answer you get will be bad — garbage in, garbage out."

Testing extends to predictive maintenance technologies that help assess equipment condition and can detect anomalies before failures happen. One of the simplest and most effective is infrared (IR) thermography, which uses an infrared camera to locate hotspots on equipment or in electrical connections.

"Many sites, especially the smaller facilities, are reluctant to hire someone for IR testing because it's

"[Rich] provides valuable safety guidance at the facilities we operate. His dedication and superb maintenance skills were essential in helping several facilities battle the lasting impacts of Hurricane Sandy."

FRANK CAVALERI

an expense and they don't see the benefit," says Hunt. "But I can do it as part of a regular visit. I can pull the equipment out of the truck, do the test and say, 'Here's a problem that may come to bite us in two weeks.' It's a value-added service that gives our clients a little more bang for their buck."

Another tool is vibration analysis, which uses an accelerometer and software to measure and trend vibration signatures in critical equipment components. "A bearing doesn't just fail in one day," says Hunt. "There's a progression, and depending on how much load is on the equipment and how clean the

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environment is, it could last a week or it could last another year. If you wait until you can actually feel or hear the vibration, chances are that bearing is already gone. The idea of vibration analysis is to track it on a routine basis, so at the appropriate time you can plan to take the equipment down and fix it."

Ultrasound technology, meanwhile, detects sound at frequencies outside the audible spectrum and allows a technician to hear problems, such as leaks in a compressed air system fitting, a bearing fault or a steam trap malfunction.

"A steam trap fills up with condensate, which then blows off and drains," says Hunt. "With ultrasound, you can hear how it opens and closes. You're supposed to hear a whoosh-click, whoosh-click. If the trap is stuck closed, you will not hear anything; if it is stuck open, you will hear steam passing by. A bearing should sound like running water — a nice, steady sound. If you hear a sound like running your fingers over sandpaper, that's a sign of trouble."

SATISFYING CAREER

Hunt finds great satisfaction in using maintenance to help treatment plants reach high levels of cost-effective, safe operation. Common issues he helps correct in facilities new to Woodard & Curran include inadequate housekeeping, improper storage of chemicals and flammables, fall protection deficiencies and equipment that has not been optimally maintained. When not on the road on site visits, he works from home, operating via computer and cell phone, going to the office only for meetings.

"It's work I like doing, and if you like doing something, you tend to do it well," he says. "I've been told in almost every area I work in that I do it pretty well. I don't see myself saving the world and creating a great environmental impact by making clean water. I'm just trying to do the best job I can. That's my satisfaction." **cpo**

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The Team Treatment

PORTLAND WATER DISTRICT PLANT OPERATORS WORKED CLOSELY WITH MIDDLE SCHOOL STUDENTS TO CREATE AN EDUCATIONAL VIDEO ON THE TREATMENT PROCESS

By Pete Litterski

Teamwork was the byword last year as wastewater operators, a sixth grade science class and a college student came together to create a 10-minute video that is now a key element in the Wastewater 101 educators' kit the Portland (Maine) Water District makes available to teachers in the community.

Parts of the video were conceived and scripted by the students of Jill Roland at King Middle School. Ellis Ducharme, a former King student now attending the New England School of Communications, shot and produced the on-site footage at the district's East End Wastewater Treatment Plant. Chief operator Steve Sloan and his team provided the technical expertise and access to the facility. Lynne Richard, former environmental educator for the district, coordinated the entire project.

A CLOSE LOOK

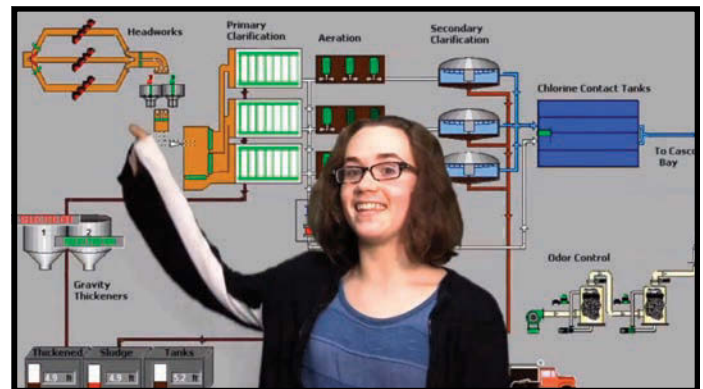
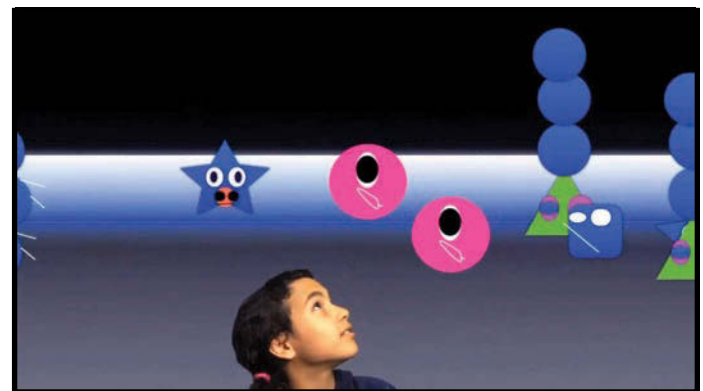
The Wastewater 101 video includes many close-up views of the treatment process from the headworks all the way through the plant. Ducharme made repeated visits to make sure he had footage that would do the process justice. "We took him around all the areas he wanted to film, and he was great," says Sloan. "Our guys answered a lot of questions and showed him everything he wanted to see."

"We really wanted this to supplement the tours and to help people coming in without any background. And for some kids, the tours are not accessible. This helps them learn without getting on a bus."

MICHELLE CLEMENTS

Michelle Clements, district public relations director, says, "I think the video was a really interesting partnership with all of the people involved." The school joined the partnership when students in one of Roland's classes decided to create a video as a capstone "Learning Expedition" for the 2011-12 school year.

For their expeditions, all four science classes were assigned to plan and carry out community projects that involved science, and one class wanted to do a video about water resources. When Roland contacted PWD about the project, Richard told her the project would fit well with one she was already working on with Ducharme.



The video (stills shown in above photos) features kids describing the wastewater treatment process.

In the end, the students' work fit into Ducharme's video in what Clements and Roland describe as a great example of teamwork. The treatment operators allowed the students to study the treatment process thoroughly, learning much more than they could on a regular tour.

Richard also gave the students a copy of *Operation of Wastewater Treatment Plants: A Field Study Training Program, Volume 1*, a manual produced by Cal State Sacramento. "We gave them the book so they could get familiar with the basic terminology and could learn as they went along on the project," Richard says.

PREPRODUCTION PHASE

King Middle School technology integrator David Grant worked closely with the students after they completed their field work, helping them organize their information, plan their shots and script their segments. Clements praised the teachers for their ability to get the entire class involved: "Even the kids who weren't on-screen in the video did work off-screen." From doing research and images to helping with the script, the students all had jobs to do.

Although Roland handled the science end of the project, Grant was the teacher who tied the package together. "He was really responsible for the physical completion on our part of the video," Roland says. "The students did all of their writing in my class, and David worked with them on their video. Then we turned it over to Ellis Ducharme."

Ducharme combined the students' work with his own video from the treatment plant, supplemented by narration from Richard. The final product delivers a succinct lesson on wastewater treatment with an approach designed to hold middle school students' attention.

"We really wanted this to supplement the tours and to help people coming in without any background," says Clements. "And for some kids, the tours are not accessible. This helps them learn without getting on a bus."

KIT FOR INSTRUCTORS

When the video screened on Jan. 4 at the King library, it became the final piece in the Wastewater 101 educator's kit. Geared to grades 3-8, the kit is largely a compilation of materials that had been available as individual items. "That kit put everything together in one neat package for teachers," says Clements.

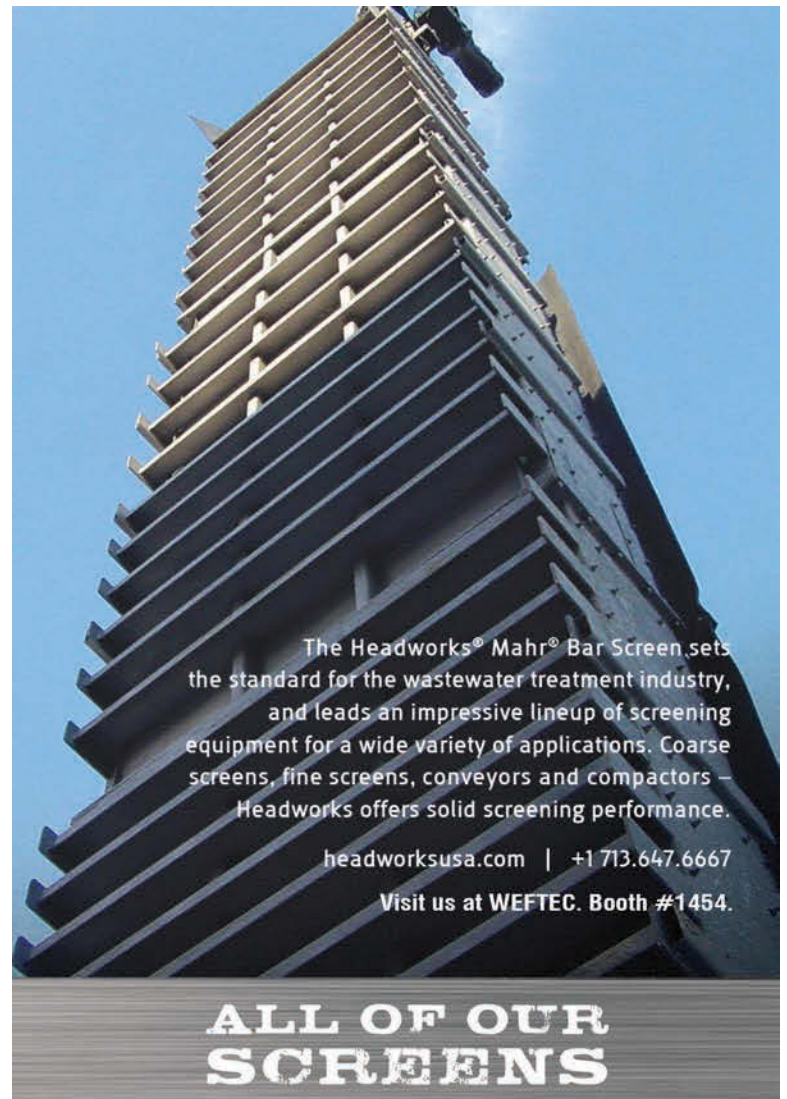
The kit includes a binder containing background information on the district, lesson plans and more. It helps students learn how wastewater treatment combines science, technology, engineering, math and environmental stewardship with protection of public health.

The district loans equipment teachers can use. An EnviroScape Watershed model and groundwater display models are available, as are macroinvertebrate sampling buckets; nets and trays; pH, dissolved oxygen, nitrate and conductivity test kits; thermometers; a flowmeter; and turbidity tubes.

The district also offers \$75 Water Education Mini-Grants for educators. Teachers can use them to buy water education materials including print and digital media, water-related curriculum materials, testing equipment for an outdoor classroom, plants for community service projects to protect water quality and transportation for field trips. In return, the district asks only for feedback, from class reports or student journal entries to drawings, photos or videos that show how the teachers and students benefited. **tpo**

What's Your Story?

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



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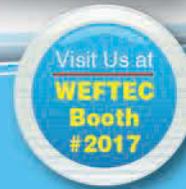
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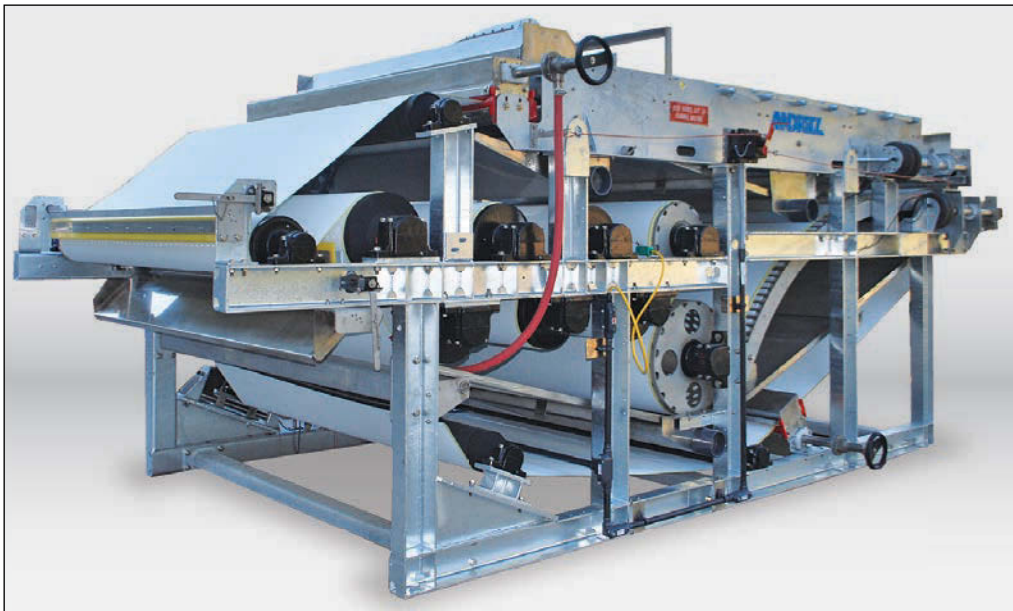
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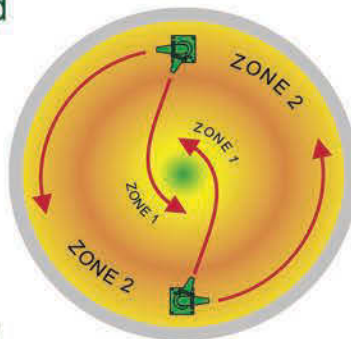


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Joining Hands

THE CITY OF EDMONTON'S MEMBRANE ULTRAFILTRATION PLANT SUPPLIES A LOCAL REFINERY WITH RECLAIMED EFFLUENT FOR PRODUCTION PROCESSES

By Jennifer Pawloski, M.Eng., P.E.

Business is thriving in Edmonton, capital city of the Canadian province of Alberta. Forecast to be one of the country's fastest growing economies over the next four years, its boom is driven by expansive oil sands projects.

But with an exploding population, outpacing the national growth rate, Edmonton's demand for water also continues to rise. The concern for water supply and quality was a primary driver for the region's substantial investment in a new wastewater membrane treatment plant.

The facility was commissioned in 2005; its main impetus was Suncor Energy's Edmonton refinery and its need for more water. Located in the North Saskatchewan River Valley, the refinery at the time processed 135,000 barrels per day of crude oil into a wide range of consumer products. It was planning a major upgrade, switching to handle heavier crude mixtures. This meant the company was reconfiguring how the refinery worked and could explore better ways to use and reuse water, and reduce water consumption.

The arrangement called for the city to design, build and operate a membrane treatment facility at the Gold Bar plant for ultimate production of up to 55 mgd of water. In addition to the treatment facility, the project would include a 3.4-mile pipeline through two city parks located along the river valley and through a provincial park to carry effluent to the refinery.



The membrane treatment facility includes ZeeWeed ultrafiltration units like this one from GE Energy. The effluent also passes through GE reverse osmosis (RO) units.

FILTER FIBERS

At the heart of the new membrane treatment plant are more than a million tiny tubes. Packed into filtration cartridges, membrane fibers draw clarified wastewater into their hollow centers under an applied vacuum. Pores on the membrane service measuring 0.04 micron filter out microscopic impurities to make the water clean enough for industrial uses.

The membrane fibers are part of a ZeeWeed ultrafiltration unit from GE Energy. For further treatment, the effluent passes through GE PRO 450 reverse osmosis (RO) units to remove molecular-level impurities, such as dissolved salts. The purified water is then used to help produce hydrogen and steam at the Edmonton refinery, and to replace 30 percent of cooling tower makeup water that was originally supplied via a river intake system.

After passing through 800-micron strainers used to protect the membranes, the secondary effluent is pumped to an elevated membrane flow distribution channel, which distributes the flow evenly between the eight ultrafiltration membrane trains. The membranes are contained within isolated concrete tanks, increasing the redundancy, reliability and flexibility of the system. The division of the system into eight identical units simplifies operations and maintenance.

Permeate pumps draw from a common suction header and provide the typical -1 and -8 psi vacuum that draws water from the outside in through hollow fiber membranes, leaving the lids behind. Periodically, the flow of permeate is reversed in a backwash



The 82 mgd Gold Bar Wastewater Treatment Plant in Edmonton operates an ultrafiltration membrane treatment process as part of a treatment train that supplies reclaimed water to an oil refinery.

THE BEST CHOICE

Suncor considered a variety of alternatives and came down to a choice between building its own system to treat water from the river or entering into an agreement with EPCOR, the utility serving Edmonton, for the supply of water from the city's 82 mgd Gold Bar Wastewater Treatment Plant, which then served a population of 700,000.

After a thorough cost-benefit and environmental evaluation, the company decided to partner with the city and EPCOR to build and operate Canada's largest membrane-based water reuse facility, using advanced ultrafiltration membrane technology.

Share Your Idea

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

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to remove accumulated fouling from the fiber pores. The membrane surface is also scoured by air introduced through a coarse-bubble diffuser at the base of the membrane module. The air causes a high shear across the fiber surface that sweeps away highly concentrated solids.

Effluent from the ZeeWeed system flows through the pipeline to the refinery and hydrogen and steam supplier. A chlorine residual between 0.5 and 1 mg/L is maintained in the pipeline for biofilm control. Two 400 gpm RO systems at the steam plant reduce the conductivity of the treated effluent from about 1,000 micromoles to 10-15 micromoles.

BENEFITS ADD UP FAST

With an investment of \$25 million to build the membrane plant, the pipeline to the refinery and the RO facility, the benefits are substantial. Suncor now uses about half the water previously required for refining, diverting 4 mgd — about 5 percent of Gold Bar plant's outflow — to the Edmonton refinery, and saving more than 700 million gallons of water since commissioning. The refinery previously ran three pumps to fill its holding ponds and now only uses one. As an indicator of the heavier blends now processed and upgraded, the refinery collects 400 tons of sulfur daily, versus 40 tons when the refinery only handled light oil.

Suncor now uses about half the water previously required for refining, diverting 4 mgd — about 5 percent of Gold Bar plant's outflow — to the Edmonton refinery, and saving more than 700 million gallons of water since commissioning.

Though boiler feedwater treatment systems were still required at the refinery, these systems could be reconfigured to handle consistent-quality recycled municipal wastewater throughout the entire year instead of dealing with the extreme variations in raw river water quality. Supplying the eventual boiler feedwater system with consistent feedwater saves in capital cost for additional pretreatment. Further, since space is no longer required to expand the water treatment system, the refinery can now use the land for hydrocarbon processing equipment.

Edmonton's Gold Bar plant membrane project pioneered an approach to water reuse for Canada, winning several awards that recognize leadership in water conservation and recycling. Perhaps the most valuable reward is the plant's readiness to meet the water needs of future industries — a win/win for today and for tomorrow.

ABOUT THE AUTHOR

Jennifer Pauloski, M.Eng., P.E., is ZeeWeed 500 product manager with GE Power & Water — Water & Process Technologies. **tpo**

The Industrial Side

TPO is exploring the possibility of adding regular information about **industrial wastewater treatment**. Since its inception in 2009, the magazine has focused on municipal clean-water plants and operators. However, industrial operators are part of the clean-water community and contribute to many local and regional industry associations. So perhaps their numbers should be represented on these pages. We welcome reader comments on this matter. **Please send a note with your thoughts to editor@tpomag.com.**

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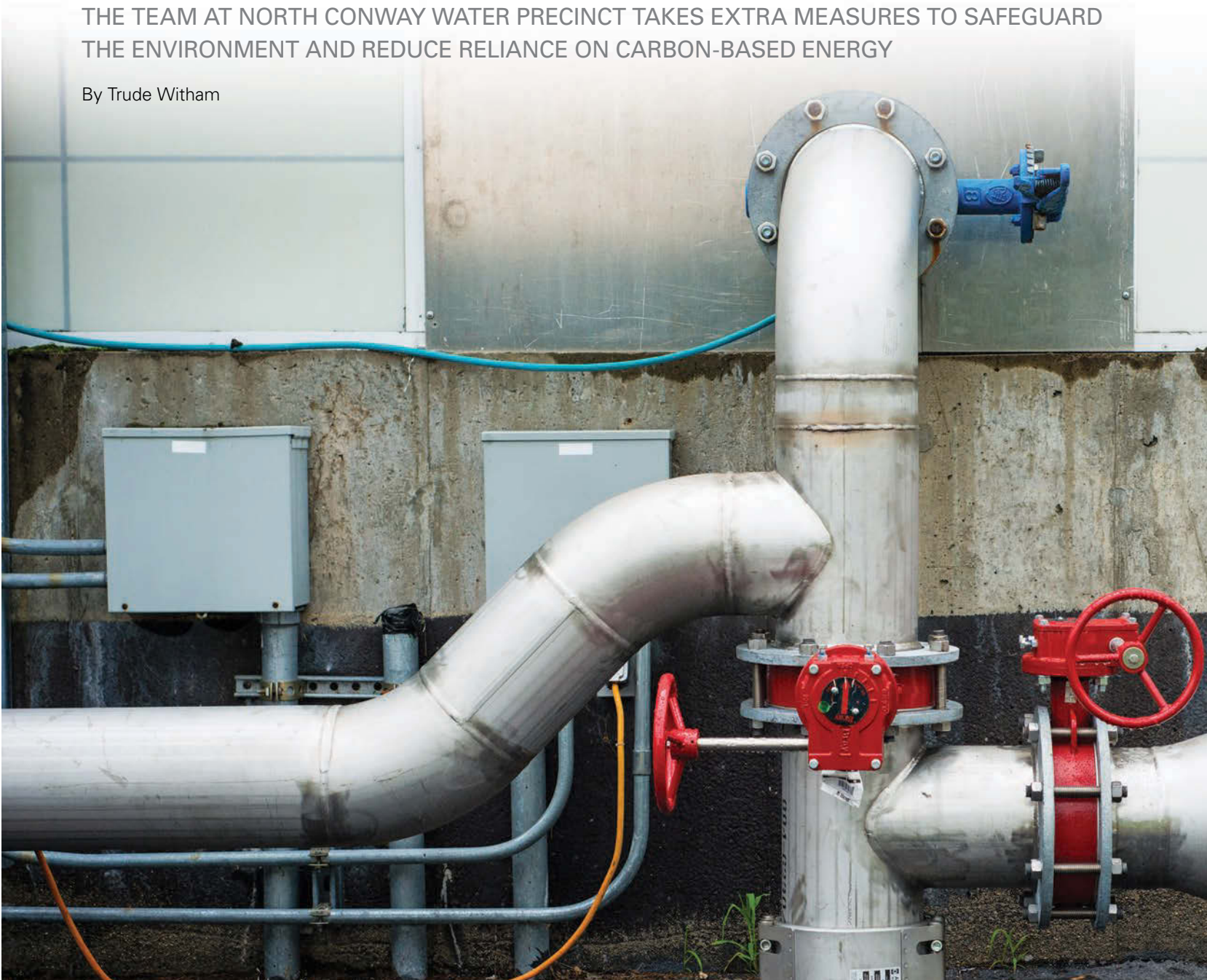
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Pursuing *Net Zero*

THE TEAM AT NORTH CONWAY WATER PRECINCT TAKES EXTRA MEASURES TO SAFEGUARD THE ENVIRONMENT AND REDUCE RELIANCE ON CARBON-BASED ENERGY

By Trude Witham



The North Conway plant crew includes, from left, Peter LaBonte, chief operator; Glen McDonald, operator II/lab technician; Aaron Bernier, maintenance supervisor; Dennis Aikens, laborer; and David Bernier, superintendent. (Photography by Joe Klementovich)



NORTH CONWAY LIES IN THE HEART OF THE MOUNT WASHINGTON Valley in New Hampshire's White Mountains. The nearby Saco River offers fishing and boating, and the local aquifer supplies drinking water. Preserving the environment of this year-round resort area is important to the North Conway Water Precinct, an independent agency that provides sewer, water and fire service.

The North Conway advanced wastewater treatment facility is doing its part to protect the environment with a five-stage Bardenpho process that discharges to infiltration beds, rather than directly to the river. The team also invests heavily in energy conservation and has set a long-term goal of reaching net zero energy — reducing demand for utility energy sources, then offsetting that with renewables. The plant already has solar panels and geothermal wells that have saved energy and reduced the plant's carbon footprint.

The plant serves a full-time population of 5,000 that grows to more than 30,000 people in the summer. Flows average 350,000 gpd during the week and 800,000 gpd on weekends.



New stainless steel piping was tied into existing aeration piping as part of a system upgrade.

“When the system was installed 16 years ago, it was the only advanced wastewater plant with zero discharge,” says precinct superintendent David Bernier. “The effluent goes to rapid infiltration basins, where the water percolates through 30 feet of sand before reaching groundwater. The sand provides significant additional treatment of the secondary effluent as it percolates down to recharge the aquifer.”

A major plant upgrade, to be completed this year, will replace old blowers and associated plumbing and dissolved oxygen monitoring equipment and will add coarse bubble diffusers in the carousel. The upgrade will allow the Village of Conway to tie into the North Conway treatment plant.

ADVANCED TREATMENT

Designed to protect the watershed while serving community needs, the wastewater treatment system's Bardenpho process (Ovivo) uses the BOD in the wastewater to remove nitrogen and promote biological phosphorus removal. The system has one anaerobic zone, two anoxic zones and two aerobic zones.

Treatment also includes a UV disinfection system (TrojanUV), 12 rapid infiltration basins (8.25-acre and 4.5-acre field-constructed basins with natural stone embankments), and a two-stage odor removal and treatment system (Pepcon Systems).

Nitrogen removal is excellent in summer, but not in winter. “A combination of low seasonal flow, low organic loading, water temperatures around 46 degrees F and excessive aerobic hydraulic detention time [average of 65 hours], all contribute to a high DO environment,” says Bernier.

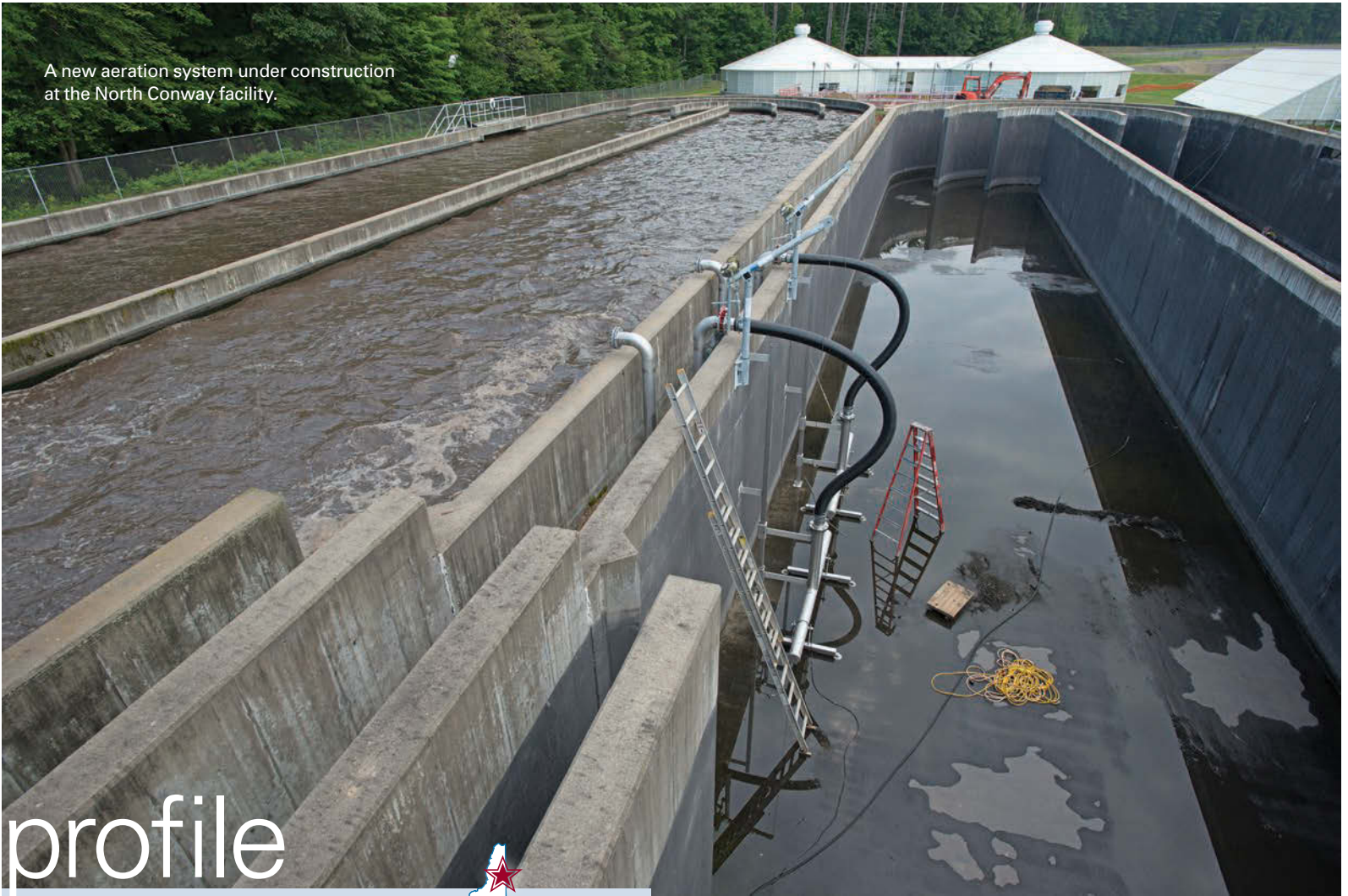
The plant team solves this problem by introducing an external carbon source (carbohydrate-based product) into the second anoxic zone. By making sufficient BOD available to the organisms, the process removes excess DO in the anoxic zone while leaving enough available food to reduce nitrate to nitrogen gas.

“The plant upgrade will eliminate this issue, along with the increased loadings from Conway Village tying into the plant and our latest \$8.2 million sewer service expansion,” says Bernier. “The additional BOD will be sufficient to lower the DO to a manageable concentration, allowing denitrification without additional cost.”

FUTURE UPGRADE

The plant upgrade was scheduled for completion in October, and Conway Village is expected to tie into the system by fall 2014. With flows expected to increase from 700,000 gpd to 1 mgd, the Precinct may need to add operators. “We'll try to make due with the existing staff for the first year or two,”

A new aeration system under construction at the North Conway facility.



profile



North Conway (N.H.) Water Precinct Wastewater Treatment Plant

BUILT:	1997; upgraded 2013
POPULATION SERVED:	5,000 (30,000 during tourist season)
EMPLOYEES:	Five
FLOW:	485,000 gpd average
TREATMENT LEVEL:	Advanced secondary
TREATMENT PROCESS:	Five-stage Bardenpho, infiltration beds
BIOSOLIDS:	Landfilled
ANNUAL BUDGET:	\$1.3 million
WEBSITE:	www.ncwph.org
GPS COORDINATES:	Latitude: 44°01'15.18" N; Longitude: 71°07'07.51" W

says Bernier. “We may concentrate on plant operations and contract out the pump station and yard maintenance duties.”

Once improvements are made to the aeration system, the only bottleneck will be biosolids dewatering. “With the plate-and-frame press, we are limited to how much we can dewater in an 8-hour day,” Bernier says. “The plan is to resolve that by having the staff work four 10-hour days. That will allow time for multiple runs per day and enable a 30 percent increase in dewatering capacity.”

Bernier says the staff is excited about the four-day work week. “It also helps that we have water distribution staff co-located at the same facility, and

we share vehicle and heavy equipment maintenance and collection system operations. That saves on labor costs and eliminates redundant tools and equipment.”

Grants and loans from the U.S. Department of Agriculture will fund the pipeline from the Conway Village wastewater treatment plant to North Conway. “The village’s plant is operating at capacity with outdated equipment that can’t remove nitrogen and phosphorus before discharge to the river,” Bernier explains. “In fact, the state has placed a moratorium on building permits in the village because of insufficient treatment capacity. That will be lifted once the village ties into our system.”

HIGHLY MOTIVATED

Four staff members operate the North Conway plant: Peter LaBonte, treatment plant chief operator (Grade IV license, 15 years at the plant); Glen McDonald, operator II (Grade IV, 15 years); Aaron Bernier, maintenance supervisor (6 years); and Dennis Aikens, laborer (Grade I, 6 years). “They work well beyond what is expected, always complete the task at hand, work independently and take considerable pride in their work,” says Bernier.

LaBonte agrees: “All are very motivated people with a can-do attitude. They installed variable-frequency drives in the plant’s compressed air system, which operates all the automatic valves, HVAC control louvers and air-operated leachate and septic pumps.”

The old aeration system ran at 100 percent speed and vented excess air. Operators replaced the influent and effluent pumps with more efficient submersible pumps (Flygt) that have energy efficient motors and an updated design that minimizes electrical consumption and maintenance.

LaBonte and his staff saved considerable money by obtaining a discharge

WINNING ON ENERGY

The North Conway Water Precinct's advanced wastewater treatment facility won the 2011 Engineering Excellence Award from the American Council of Engineering Companies of New Hampshire.

"The project came about after a meeting I attended at the state Department of Environmental Services," says precinct superintendent David Bernier. "New Hampshire was required to make a certain amount of money available for green energy improvements, and I asked our engineers, CDM & Smith, to fast-track an energy upgrade for our plant."

The plant considered wind, solar, hydro and geothermal power and decided on solar and geothermal. "Our geology is conducive to geothermal and solar because we have adequate space near the plant for direct consumption of solar power," says Bernier.

Besides savings from an annual 255,000 kWh of solar energy, the solar and geothermal energy project was given a 50 percent loan forgiveness grant. The North Conway plant and its staff have earned other recognitions in recent years.

Bernier received the 2012 Operator of the Year Award from the Granite State Rural Water Association for "outstanding contributions in the water and wastewater industry and his management of the North Conway Water Precinct — the largest green energy project in New Hampshire." He was also recognized by Senator Jeanne Shaheen for his renewable energy efforts.

Peter LaBonte, wastewater treatment plant chief operator, accepted a U.S. EPA national Wastewater Operations and Maintenance Excellence award for the plant in 2005. The plant also won the EPA New England Region 1 award in 2003.

permit modification to discontinue UV disinfection before discharge to the infiltration basins. LaBonte submitted the request to the state Department of Environmental Services with references taken from the U.S. EPA Process Design Manual under Land Treatment of Municipal Wastewater, and with supplemental information from the Supplement on Rapid Infiltration and Overland Flow.

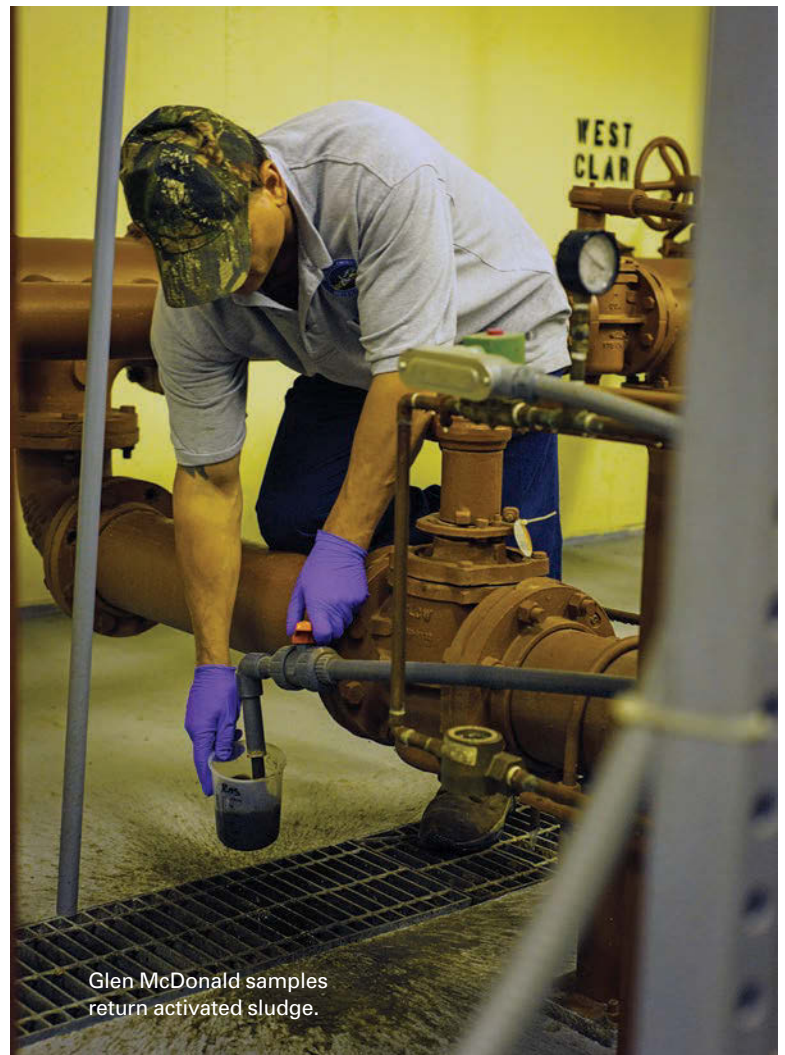
"The effluent goes to rapid infiltration basins, where the water percolates through 30 feet of sand before reaching groundwater."

DAVID BERNIER

"In general, studies show that rapid infiltration in itself can be of very high quality with respect to viral and bacterial content," says Bernier. "Since the plant effluent travels through 30 feet of sand before reaching groundwater, and because there is no on-site recovery of water for drinking, the request was granted." The department recommended that the UV be taken offline but left operational for possible future use. The plant saves \$60,000 a year on energy with the UV offline.

Operators do a little bit of everything, including lab work, maintenance, grounds work, painting and cleaning. When a job requires more people, Bernier can bring in water distribution team members. "Everyone takes great pride in the facility, and visitors always comment that the plant looks brand new," says Bernier.

The plant promotes in-house training and provides paid continuation training. "If an operator only needs a grade II license for the job, but is willing to seek a higher level, we pay them a higher hourly rate," says Bernier.



Glen McDonald samples return activated sludge.

"Not only does this improve their individual skill set, it provides opportunities down the road for promotion," says Bernier.

REDUCING COSTS

The North Conway plant significantly reduced energy costs with a number of measures. On the water distribution side, the team reduced electrical costs from 36 percent of budget to 12 percent by pumping water only at night when the rates are lower. "This was done seamlessly via our SCADA system and control," Bernier says. "We have also lowered our unaccounted for water consumption from 36.6 percent to less than 11 percent over the last seven years. That means less pumping, less cost for chemicals, and less wear and tear on pumps and ancillary equipment."

The plant has saved 50 percent on chemical costs during the past seven years by purchasing full tractor trailer deliveries. This also saves on trucking fees, as the chemicals are now delivered directly from the manufacturer.

Other savings include 5 to 8 percent in electrical costs from purchasing power directly from the wholesale supplier. "We participate in a demand response program where we are asked to self-generate our power when the New England power grid experiences excess demand," says Bernier. "That allows us to exercise our generators under load and get paid to do it." That makes money for the plant, which also sells renewable energy certificates from its solar array on the open market.

The plant also saves money for customers and the town by accepting and treating leachate from the local landfill. "That saves the town more \$550,000 in trucking and disposal costs for the leachate," says Bernier.

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North Conway Water Precinct Wastewater Treatment Plant PERMIT AND PERFORMANCE

	PERMIT (monthly average)	EFFLUENT (2012 average)
BOD	20 mg/L	3.8 mg/L
TSS	20 mg/L	5.8 mg/L
Ammonia N.	5 mg/L	<0.25 mg/L
Total Nitrogen	10 mg/L	7.3 mg/L
Total Phosphorus	2 mg/L	0.78 mg/L



The facility's plate-and-frame press delivers high-quality biosolids cake.

"To help us achieve net zero, we are toying with the idea of adding more solar arrays and using effluent for geothermal."

DAVID BERNIER

NET ZERO ENERGY

Bernier would like the plant to become a net zero consumer of energy: "As environmental stewards we must set an example and reduce our dependency on carbon-based energy. The single highest cost of treatment plant operation is electricity. Eight years ago, it was 35 percent of our operating budget; today it is less than 18 percent."

The plant has installed 744 solar panels with a capacity of 167.4 KW that generate a yearly average of 255,000 kWh — 22.5 percent of the plant's consumption. Premium efficiency motors, many coupled with variable-frequency drives, also save energy. Plant employees did this work in-house.

"Many small or medium utilities are not willing to do this because they are afraid of the negative consequences should something go wrong or if the benefits are never realized," says Bernier. "As a result, the municipal sector often hires engineers to design and install the improvements. I personally would back up my employees on these projects and take full responsibility for the outcome. I think they realize that, and they know I appreciate everything they do. That is part of the reason why we are successful."

The plant uses geothermal wells for cooling in summer and heating in winter. Although there was a learning curve during the first year, minor modifications have led to a reliable and efficient system. "To help us achieve net zero, we are toying with the idea of adding more solar arrays and using effluent for geothermal," says Bernier. "Once emerging technologies have advanced enough to be cost-effective, we may consider the use of effluent and solar to extract hydrogen for possible use in fuel cells for generating power."

It's just another way to take care of the environment and protect a special place for local residents and visitors alike. **tpo**

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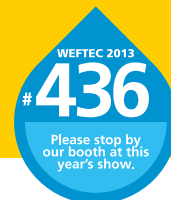


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The Pen Is Mighty

DOUG SIBOLSKI SAW PUBLIC OPINION TURNING AGAINST HIS CITY'S TREATMENT PLANT. HE SAID GOODBYE TO THE LOW PROFILE AND TOOK TO THE NEWSPAPER TO SET THINGS STRAIGHT.

By Ted J. Rulseh

Many clean-water operators prefer to keep a low profile: *I do my job, I do it well, that's enough, I don't need recognition.* Sometimes, unfortunately, keeping quiet allows misinformation about a plant to take hold, and that can do damage.

It happened in Lockport, N.Y., a city of about 19,000, where consistent bad publicity, based on misinformation, caused the treatment plant to be issued a state permit much stricter than plant operators felt was justified by the quality of the receiving stream.

Upon taking over as chief operator of the 22 mgd (design) activated sludge plant last January after 26 years at the site, Doug Sibolski kissed the low profile goodbye. He took to writing a series of columns for the *Lockport Union-Sun & Journal* newspaper. The first appeared in June.

In the columns, Sibolski addressed the specific issues surrounding the plant's permit and generally explained what happens in the collection system and the treatment plant, why it all matters and how the public benefits. He talked about his experience in an interview with *Treatment Plant Operator*.

tpo: What was the force behind your decision to write these columns?

Sibolski: We did it out of necessity. Our permit was up for renewal. Downstream from us on our receiving stream, which is Eighteenmile Creek, there's a beach on Lake Ontario. The county health department often closes that beach after rain events because of coliform bacteria levels.

"A lot of farmers along the creek spread manure for their fields. Besides that, there are two dams between us and the town. There is no way coliform from our plant gets to that beach."

DOUG SIBOLSKI

We're more than 13 miles away from the beach by way of the creek, which the state has rated as a D stream. The superintendent of the town where that beach is located began to go public, without any facts, saying our plant was polluting the creek and causing the closings of his beach. He went on for about a year spouting that on the radio and wherever else he could.

tpo: What exactly is a D stream?

Sibolski: Our state Department of Environmental Conservation ranks streams from A to D for water quality, D being the poorest. Eighteenmile Creek is a D stream because it was polluted for about 150 years with PCBs and heavy metals from industry.

tpo: What led this town official to blame the beach closings on your facility?

Sibolski: We are one of very few plants that are not required to disinfect our effluent. We used to chlorinate. But that requirement was taken off our

permit back in 1997 because the DEC found that the chlorine residual, even though it was quite small at less than 0.5 mg/L and the lowest we could achieve, was more detrimental to the creek than any fecal coliform that would go into it.

tpo: Can you document that your facility is not the source of the coliform bacteria?

Sibolski: Yes. We do put coliform into the creek, but our testing has shown that it dissipates within less than two-tenths of a mile. In addition, the county health department performed DNA tests on the coliform bacteria collected at the beach. Those tests proved that the source was second-stomach animals — like cows and deer. A lot of farmers along the creek spread manure for their fields. Besides that, there are two dams between us and the town. There is no way coliform from our plant gets to that beach.

tpo: Given that this town official's information was wrong, what made it such a problem?

Sibolski: It became a problem because we kept our mouths shut. Over a year's time members of the public who had heard the complaints started getting on the radio, getting on the bandwagon and blaming us. The town superintendent had people from the area writing

to the newspaper saying they were doctors and recommending that our plant be denied a permit and should be closed, which when you think about it is ridiculous. In the meantime our permit was up for renewal, and we were just sitting back taking the punishment.

tpo: Was your permit actually affected by this controversy?

Sibolski: The state made our permit much tougher than it had been, at a big cost to our city. The creek is a D stream, yet some of the requirements they put on us are appropriate for an A stream. For example, they now require a DO of 7.0 mg/L, while the state standard for a D stream is anything above 3.0 mg/L. And there are other stipulations. Under our permit now, we have to test the creek for coliform once a month from June to September, all the way down to Lake Ontario — a total of 13 samples. We're doing what the county health department used to do. That costs extra money.

tpo: At what point did you decide to write the newspaper columns?



Doug Sibolski

“I think this is an industry that doesn’t get out there enough to let the people know what we do. For that reason we’re the unseen, the unspoken — when we ask for money, people don’t understand why, and we tend not to get a lot of money or a lot of attention.”

DOUG SIBOLSKI

Sibolski: When I became chief operator, I talked to the mayor, the city council, the sewer committee and the city attorney and said we needed to counteract the misinformation with the public. I thought it was about time we did some PR so that people would understand that we’re not here polluting the creek, we’re here to keep it clean.

tpo: How did you get the newspaper to agree to publish your columns?

Sibolski: The aldermen here do a monthly local TV program. Each of them has an hour to take call-in questions. One of the aldermen invited me to go on. One of the newspaper reporters saw the show and talked to me afterward. I told her about the radio publicity and the people calling in blaming us, and where it all began, and how I would like to counteract that with some articles. They thought that was a great idea.

tpo: How did you proceed from there?

Sibolski: I started by writing two articles. The first was an overview so that people could get a basic understanding of the situation with the creek. When I showed it to people here at work, they said, ‘Doug, you’re writing this as if you’re back in college writing a technical paper. People aren’t going to understand it.’ So I had to simplify it and get it to language the layperson would understand. That wasn’t so easy.

My plan over a period of six to 10 articles is to bring it down into the plant so that people understand what we do here. We are environmentalists. We are people who love our jobs, and if given the chance we’ll talk and talk and talk about it, yet people don’t know about what we do. The paper gave me the opportunity, and I’ve taken advantage of it. They run my article every fourth Sunday of the month. There is a lot to talk about.

tpo: How would you describe the reaction from the public?

Sibolski: From the beginning I got quite a few comments from people saying they couldn’t wait to read the rest of them. We’re getting quite a bit of feedback. We’ve had a compost facility here for 24 years and we allow people to buy it for \$10 a yard. When people come in to pay, my office is right there, so I hear from them.

tpo: What would you say to other clean-water operators who might be thinking about raising their profile with the public?

Sibolski: I think this is an industry that doesn’t get out there enough to let the people know what we do. For that reason we’re the unseen, the unspoken — when we ask for money, people don’t understand why, and we tend not to get a lot of money or a lot of attention. The police department and the fire department normally get all the attention and the money. I think the people would be interested in us — we just need to get the information out there.

The old school tended to say you shouldn’t bring the public into what you’re doing, that you don’t hold an open house, that you keep things more secretive. I’m on the opposite side of that. I think as long as you have a clean nose, you should open up to the public and let them know exactly what you’re doing. I think it hurts when we close ourselves off. We don’t have anything to hide. I think it’s time we speak up. **tpo**



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HOW TO TAKE ADVANTAGE OF INFOGRAPHICS



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CH2M HILL PARTNERS ON \$80 MILLION CONTRACT FOR BIOSOLIDS UPGRADES IN SAN FRANCISCO

CH2M HILL, as part of a team with Brown and Caldwell, won an \$80 million contract with the San Francisco Public Utilities Commission (SFPUC) to provide planning and engineering for the Southeast Plant Biosolids Digester Facilities Project, a \$1.5 billion investment that will provide critical upgrades for San Francisco's wastewater system. The project will replace all biosolids processes at San Francisco's Southeast Water Pollution Control Plant.



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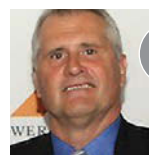
As a licensed operator, you know your primary task is protecting the public. Keeping plant and system personnel safe is equally important. Many tasks these workers perform can be hazardous. Each plant should have its own written safety and health program for operator training, and plant safety officers should be the frontline agents for worker safety in a municipality.

IS IT TIME TO GET (A LITTLE) POLITICAL?

Do you know who your State Senate, State Assembly, U.S. Representative and U.S. Senators are? Have you ever written them a letter or sent them an email? Have they been to your facility? Do they know you exist? Remember, the folks in the statehouse and in Congress also make decisions that affect what you do, where your money comes from, and the standards your effluent has to meet. Getting close to elected representatives helps further the aims of The Fire Chief Project: Raising clean-water operators to the status of the fire chief, and making kids grow up wanting to be clean-water operators.



ENERGY EFFICIENCY UPGRADES EARN CONNECTICUT WASTEWATER TREATMENT FACILITY THREE AWARDS



Mike Bisi

Wastewater treatment facilities are big electricity users. The Town of Glastonbury, Conn., made energy efficiency a big priority in upgrading its plant. The town received three Power of Change Awards, including Top Municipal Wastewater Treatment Plant, from the governor's office. “The award recognizes the hard work by our team on a daily basis to make our plant as efficient as possible,” says Mike Bisi, the town's superintendent of sanitation.

Check out all these stories at www.tpomag.com/ec/2013/October

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The biosolids storage basins at SRCSD in Elk Grove. (Photography by Lezlie Sterling)

Into the FOG

THE SACRAMENTO REGIONAL WASTEWATER TREATMENT PLANT HAS FORMED PARTNERSHIPS FOR COGENERATION AND FOR GREASE COLLECTION TO BOOST BIOGAS PRODUCTION

By Doug Day

THE SACRAMENTO REGIONAL WASTEWATER TREATMENT Plant in Elk Grove, Calif., thrives on partnerships. Among these is a program that treats imported fats, oils and grease (FOG) to increase production of biogas for an on-site cogeneration plant.

Owned and operated by the Sacramento Regional County Sanitation District (SRCSD), the plant treats wastewater for 1.4 million residents and leases part of its land for the cogeneration plant, a biosolids recycling operation and a firm that manufactures ice (see sidebar).

The FOG program was launched earlier this year in an effort to improve sustainability. Jose Ramirez, senior civil engineer, says the improvements go along with a new FOG receiving station called the Biogas Enhancement Facility (BEF).

“Everyone worked really hard to assist the contractor in expediting submittal reviews and process access requests to move the project along.”

GERARDO AGUIRRE

The idea came from discussions that started in 2006 between SRCSD and the Sacramento Municipal Utilities District (SMUD), the local electric company, about biogas production by direct injection of FOG into the anaerobic digesters.

“We started with a planning-level feasibility study that proved it was technically feasible and recommended a small-scale pilot project,” says Ramirez. The two agencies then co-funded a pilot project. The results were positive, and the agencies agreed to move forward with a full-scale project.

GOOD TIMING

As luck would have it, the decision to make a large capital investment came at the same time the federal government made available billions of dollars in stimulus funding through the American Recovery and Reinvestment Act of 2009. Facing a \$35 million overall cost, the SRCSD/SMUD partnership garnered \$1.45 million in stimulus funds and \$100,000 in matching funds from the California Energy Commission.

Construction and initial testing of the facility was completed in December 2012. The plan came with a challenging completion schedule. “Everyone worked really hard to assist the contractor in expediting submittal reviews and process access requests to move the project along,” says Gerardo Aguirre, associate civil engineer and project engineer. It was designed and completed in about 20 months.

The new FOG receiving station keeps commercial FOG out of the collection system and treatment process. This allows for more efficient treatment and disposal and reduces

the risk of collection system backups. The facility was designed to process up to 42,000 gallons of FOG per day.

“Before this, FOG was processed through the plant’s primary and secondary treatment process,” explains Ramirez. “Those processes lose much of the energy available from the FOG. We see a direct benefit to energy production and operations and maintenance by removing the FOG from the treatment processes.”



Biogas/biosolids team members at the Sacramento district include, back row, from left, Stephen Moore, associate civil engineer; Kathleen Ave, project manager; Jose Ramirez Sr., civil engineer; and Grayson Kohls, assistant civil engineer II; front row, Mitchell Maidrand, principal civil engineer; Gerardo Aguirre, associate civil engineer; and Debra Buckmann, assistant civil engineer II.

Area haulers and FOG producers, such as restaurants, benefit because they no longer have to ship grease to out-of-county facilities. That saves on transportation costs, and the fees they pay to SRCSD are competitive. “We had a policy that we wouldn’t accept any FOG from outside Sacramento County, so some FOG was being trucked to distant facilities in the Bay area,” says Ramirez. “With the new facility, we now accept FOG material from outside of Sacramento County.”

Haulers unload directly to the BEF, and the FOG is added directly to the mixed sludge loop that feeds the digesters. This direct injection to the digesters will break down FOG more efficiently and produce more biogas.

“For the last few years, we were getting about 10,000 gallons of FOG per day,” Ramirez says. “We’re expecting ultimately to get as much as 30,000 to 40,000 gallons per day.” Haulers are not required to secure a contract with the wastewater treatment plant, but they must obtain a permit.

FOG DIGESTION PAYING FOR ITSELF

The tipping fee for haulers is one of the main revenue sources for the FOG program, designed to fully fund operation and maintenance and pay off SRCSD’s investment of just over \$2 million.

Biogas produced at the wastewater treatment plant is piped next door to the 100 MW Carson Energy cogeneration plant, operated by SMUD on property leased from the SRCSD. The biogas is also delivered



Synagro plant manager
Jan Guy surveys operations.

profile

Sacramento (Calif.) Regional Wastewater Treatment Plant



POPULATION SERVED: 1.4 million

FLOWS: 181 mgd design, 140 mgd average

TREATMENT PROCESS: Conventional pure oxygen secondary treatment

BIOSOLIDS PROCESS: Anaerobic digestion

BIOSOLIDS VOLUME: 70 dry tons per day

BIOSOLIDS USE: 30 percent pelletized for commercial fertilizer,
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to SMUD’s Cosumnes Power Plant in southern Sacramento County. The additional biogas from the new BEF is enough to provide electricity for up to 3,000 homes a year.

In exchange, the wastewater treatment plant receives process steam for facility heating and to maintain its digesters at the optimum 95 degrees.



Debra Buckmann walks among the biosolids storage basins.

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The BEF has been a sound investment for both SRCSD and SMUD. It is expected to improve treatment plant efficiency, increase biogas production, provide a more affordable option for managing FOG and reduce greenhouse gas emissions from transporting FOG to more distant sites. **tpo**

RECYCLING

The wastewater treatment plant is one of the largest producers of biosolids in California, processing 26,000 dry tons a year. Thirty percent of the biosolids — 20 tons per day on average — is pumped from the anaerobic digester to an on-site biosolids recycling facility owned and operated by Synagro. It was the first biosolids recycling operation in California when it was established in 2004.

It treats biosolids to Class A standards through dewatering, heating and drying. The resulting pellets, 7,500 dry tons per year, are sold to the local agricultural community, producing a small stream of revenue for Synagro. In the near future, Synagro may partner with a local fertilizer manufacturing firm to produce a bagged fertilizer product that can be sold at home improvement stores.

The remaining 70 percent of biosolids are pumped and treated at 20 on-site lagoons. They remain there for three to five years until harvested and land-applied on three sites on the plant property, covering about 120 acres.

CREATIVE PARTNERSHIPS

The Sacramento Regional Wastewater Treatment Plant property is home to other complementary facilities. The 3,350-acre site is home to Synagro's Biosolids Recycling Facility, which converts biosolids to commercial fertilizer.

A Sacramento Municipal Utilities District cogeneration facility uses biogas from the anaerobic digesters to generate electricity and produce steam. Some of the electricity powers the wastewater treatment plant, and some of the steam heats the digesters.

On the far south corner of the property sits a 72,000-square-foot Glacier Ice manufacturing plant, which uses some of the steam to power refrigeration systems that produce premium packaged ice products, including dry ice and blocks for ice sculptures.



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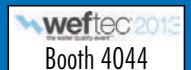
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Many volunteers along with Southwest Wastewater Treatment Plant staff helped with a project to restore a stretch of the plant's receiving stream.



Beyond Boundaries

A PLANT TEAM IN SPRINGFIELD SPEARHEADS A MAJOR EFFORT TO RESTORE TWO MILES OF BANK ON AN ECOLOGICALLY IMPORTANT STREAM THAT ALSO RECEIVES PLANT EFFLUENT

By Jeff Smith

To the team at the Southwest Wastewater Treatment Plant in Springfield, Mo., passion for delivering clean water reaches far beyond the facility boundaries.

During two weekends in spring 2013, many employees of the 42.5 mgd (design) activated sludge plant joined 150 community volunteers to plant more than 7,000 seedlings along a nearly two-mile stretch of Wilson's Creek, which is the plant's receiving stream.

"It was quite an event, full of enthusiasm and pride by everyone," says Stephanie Gott, plant biologist, who coordinated the effort. The idea to restore the stream corridor nearly a mile from the plant emerged more than two years ago when the city's Clean Water Services division transferred responsibility for upkeep of the large properties next to the plant to the facility's operations department. The plots served as a buffer around the plant and had been leased to farmers for cattle grazing with no oversight. That proved detrimental to Wilson's Creek.

PRECIOUS RESOURCE

"What's unique about Wilson's Creek is that it runs through all three properties as well as right through the plant itself," says Kelly Green, plant superintendent. "It's very near and dear to our hearts." The creek also flows to the James River, a water source for the city, and eventually to Table Rock Lake, an Ozark reservoir with significant economic impact to the region and state.

"I took it as a water quality issue," says Green. "Steve Meyer, director of the Environmental Services Department which we are a part of, was extremely open to the project." The city was willing to take on the project alone, but Gott found grants through collaboration with three entities: the James River Basin Partnership, whose mission is to protect and improve waterways; the

state Department of Conservation; and the Ozarks Greenway Trail System.

The first priority was to build a fence to create a 100-foot buffer along both stream banks. A contractor erected the five-strand barbed wire fence with steel corners and H-braces. Plant operators, mechanics and laborers did the rest of the work in cleaning up the properties.

The next phase was a landscape contractor's planting of 120 oak, cypress, sycamore and river birch trees, each 6 to 18 feet tall, along both sides of the stream banks to form an anchor against further erosion and contamination. The final phase was the planting of seedlings by citizen volunteers and students from Missouri State University, Drury University and grade schools.

"It was a humbling experience to coordinate groups of such compassionate people. Our planting was a success."

STEPHANIE GOTT

PLANT TEAM INVOLVED

Volunteers included parents and their children, co-worker teams, college classmate teams and teams of people meeting for the first time. "It was a humbling experience to coordinate groups of such compassionate people," says Gott. "Our planting was a success."

Among the employees who helped with the planting were Dan Mooneyham, plant operator 3; Kenny Carlisle and Jack Davis, maintenance mechanics; Philip Costa, labor supervisor; Barney Christian and Tyson Pingel, laborers; and Terry McConnel, operator.

"We work very hard and are very proud of what we do," Green says. Awards are a big source of that pride. The plant's recent awards include a sec-

(continued)



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ond Platinum Award for permit compliance from the National Association of Clean Water Agencies and the 2010 Plant Of The Year award from the Missouri Water Environmental Association.

Green says the idea to clean up the properties and Wilson's Creek originated within the plant team, and the effort grew from there: "I just thought it made perfect sense from a water-quality viewpoint and perception viewpoint for both the citizens of Springfield and the Southwest treatment plant." **cpo**

PHOTO BY STEPHANIE GOTT



Melissa Bettes (orange vest, right) from the James River Basin Partnership trains volunteers.

PHOTO BY JOE PITTS



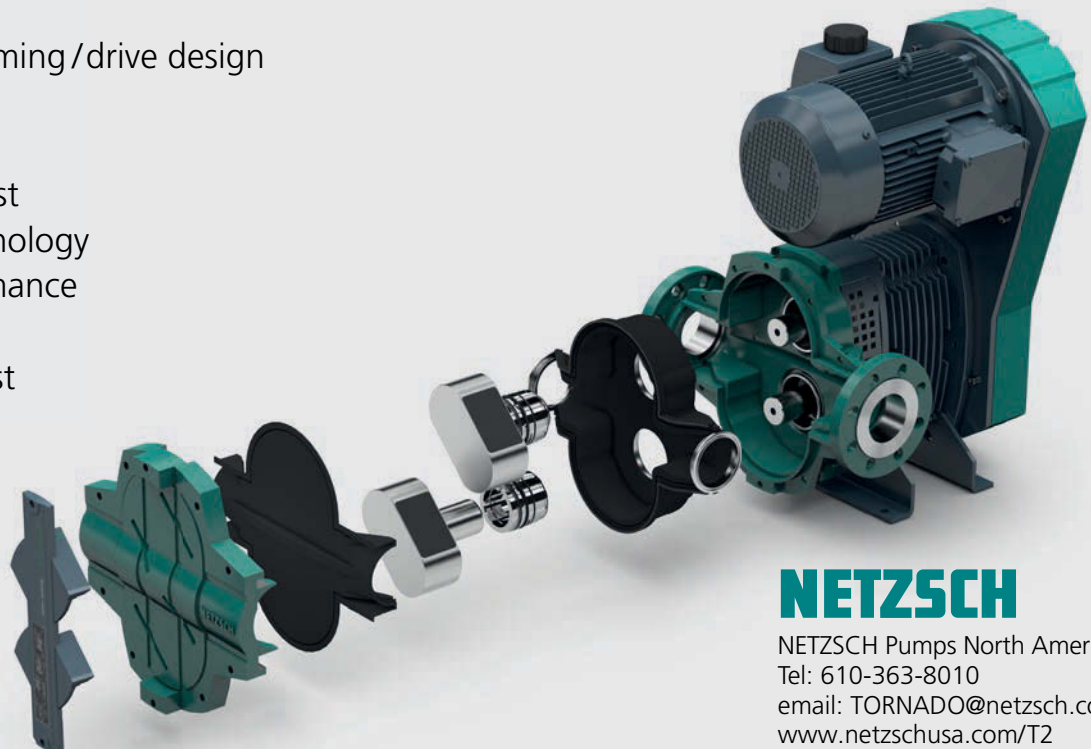
Share Your Ideas

The treatment plant staff includes, from left, Phillip Costa, Barney Christian, Dan Mooneyham, Stephanie Gott, Kenny Carlisle and Jack Davis.

TPO welcomes news about interesting features of your facility's grounds, signage or buildings for future articles in the PlantScapes column. Send your ideas to editor @tpomag.com or call 715/277-4094.

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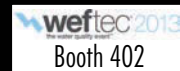
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THE NATION'S FIRST USE OF GLYCEROL TO REDUCE NITROGEN SAVES MILLIONS IN CAPITAL INVESTMENT FOR A NEW YORK CITY TREATMENT PLANT AND HELPS JAMAICA BAY RESTORATION

By Doug Day

Nitrogen from wastewater treatment plants isn't a threat to human health, but it can reduce oxygen levels in water bodies and promote excess algae growth that can harm the ecosystem.

As part of efforts to restore Jamaica Bay, the New York City Department of Environmental Protection (DEP) is taking steps to cut nitrogen discharges. One of those projects was a test of glycerol for reducing nitrogen in effluent.

A \$2 million research and development project was completed and the new system put online in December 2011 at 26th Ward Wastewater Treatment Plant. The technology, the first of its kind in the world, removes nitrogen from effluent by adding glycerol, a high-carbon byproduct of biodiesel production that is nonhazardous and



The 85 mgd 26th Ward treatment plant in New York City is the first site in the nation to use glycerol to reduce nitrogen in effluent to protect the sensitive Jamaica Bay estuary.

nonflammable, to a dedicated separate centrate aeration tank. It has reduced the nitrogen discharges by 3,000 pounds per day (67 percent).

SAVING THE BAY

That's good news for Jamaica Bay, target of an extensive protection plan since 2007. The reduction from the 26th Ward facility amounts to 10 percent of the total nitrogen discharged to the bay. The project bodes well as the DEP continues efforts to reduce nitrogen loading from its treatment plants, which account for nearly 90 percent of the nitrogen reaching the sensitive 31-square-mile estuary between Long Island, Queens and Brooklyn.

As part of the bay restoration efforts, the state Department of Environmental Conservation set limits to reduce nitrogen discharges by 50 percent. "Jamaica Bay's water quality has been impaired for the last several decades," says Zainool Ali, 26th Ward plant superintendent. "Excessive nitrogen has caused a lot of algae blooms and low oxygen levels. Reducing nitrogen will help restore the natural plants and aquatic life."

Before the new glycerol project was put online, the Ward plant was putting about 5,000 pounds of nitrogen per day into Jamaica Bay. That has been cut to 1,900 pounds, helping to meet the current aggregate permitted level for the bay of 36,500 pounds per day. The long-term goal is to essentially eliminate nitrogen discharges to the bay.

AWARD-WINNING DISCOVERY

For the successful project, the DEP and its research consultants, the New York offices of Hazen and Sawyer and CH2M Hill, received the 2013 American Council of Engineering Companies of New York's Empire Award, the group's top engineering excellence honor. "It was a very successful study that demonstrated a new wastewater treatment technique that is so important to New York and other municipalities around the globe," adds Ali. "The discovery represents an important step toward more efficient and sustainable wastewater treatment."

The glycerol process is a variation of biological nutrient removal and enhances denitrification. As ammonia undergoes treatment, it is converted to nitrites and nitrate. When glycerol is added to the aera-



Zainool Ali, left, plant superintendent, and Bill Sedutto, process engineer, in the glycerol storage and pumping room. A \$2 million research and development program prevented a \$30 million expenditure to reduce nitrogen discharges into Jamaica Bay.



The glycerol storage and piping system.

“Jamaica Bay’s water quality has been impaired for the last several decades. Excessive nitrogen has caused a lot of algae blooms and low oxygen levels. Reducing nitrogen will help restore the natural plants and aquatic life.”

ZAINOOL ALI

tion tanks in the anoxic zone, it helps convert the nitrate and nitrite to nitrogen gas, which is released into the atmosphere. The process uses 1,400 gpd of neat glycerin. “It is a very simple solution,” says Ali. “It was a seamless transition for the operators when we added it.”

THE LARGER STRATEGY

Reducing nitrogen discharges to Jamaica Bay was the subject of a 2010 agreement between the New York State Department of Environmental Conservation, the Natural Resources Defense Council and other environmental groups. The New York City Department of Environmental Protection has committed to spend more than \$100 million to reduce nitrogen from its four wastewater treatment plants that discharge to the bay by 50 percent over the next 10 years.

Another \$20 million will go toward wetland restoration. That is in addition to \$770 million for nitrogen reduction measures at the four plants that discharge to the East River, which empties into Jamaica Bay. That will reduce total nitrogen discharges into the East River by more than 52 percent.

The DEP is responsible for wastewater and drinking water treatment in New York. It provides 1 billion gpd of drinking water to more than 9 million people and treats 1,805 mgd of wastewater. Since 2002, the city has invested \$8.9 billion to upgrade its wastewater treatment plants and reduce combined sewer overflows.

The glycerol alternative prevented an expenditure of \$30 million for an ammonia recovery system. Another alternative was to use methanol, used by about 200 treatment plants in the U.S. “As opposed to glycerol, methanol is more challenging for operators to safely handle, and it costs much more to store given its composition,” says Ali. Glycerol is also a byproduct of the bio-diesel industry and so it is readily available as producers seek alternatives to expensive treatment needed to make it useful in other ways, such as for pharmaceuticals and cosmetics.

MAJOR COMMITMENT

The DEP has committed \$115 million to remove nitrogen discharges into Jamaica Bay as part of a 2010 agreement to restore the bay’s wildlife habitat. DEP’s Research and Development Section is testing a next-generation use of anamox. While it is in its infancy, Ali says, it shows promise for saving a considerable amount of money while cutting nitrogen emissions further.

Ali expects DEP to add the glycerol system to at least some of its seven other wastewater treatment plants that discharge to Jamaica Bay or the East River, which flows to the Bay. The 26th Ward plant has a design capacity of 85 mgd, and it can treat up to 170 mgd of wet weather flow. It also receives sludge for treatment from four other DEP facilities.

As successful the glycerol process has been, work continues on refining it. “Even though it has significantly helped nitrogen reduction, it is still being perfected,” says Ali. One thing under study is additional air treatment in the aeration tank to see if that could save energy or reduce chemical usage. **tpo**

What’s Your Story?

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Tanks, Structures and Components

By Craig Mandli

Wastewater treatment plants contain various infrastructure, including wastewater bins and tanks, clarifiers and covers. These products, which also include products designed to maintain that infrastructure, will help treatment plant operators make sure their plants are in top condition.

Bins/Hoppers/Silos

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High Solids Anaerobic Digestion (HiSAD) System from Infilco Degremont

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Fiberglass sump and sewage basins from TOPP Industries

Clarifiers/Components



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Sludge Mate container filters from Flo Trend Systems

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ACTIFLO clarification process from Kruger USA

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Hi-Tech solids-contact clarifiers from Kusters Water

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CLAR-I-VATOR high-rate solids-contact clarifier from Smith & Loveless



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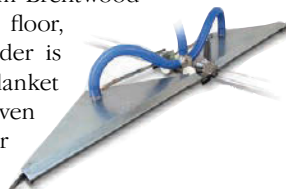


Drive units from WesTech Engineering

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Full Circle Vortex grit systems from Envirodyne Systems

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GR and GRO digester systems from Schreiber

AEROBIC DIGESTER

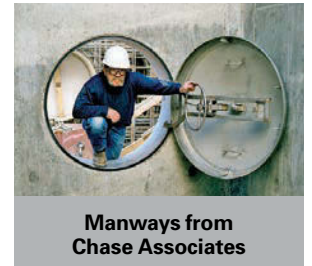
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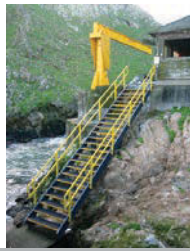
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fabricate. They include everything needed to install OSHA- and IBC-compliant horizontal and inclined handrail systems with two or three rails. Specialty picketed handrail systems are available. Other options include ladders, standard walk-throughs and safety cages, including a retractable walk-through for applications such as man-holes, pits or indoor roof access points where covers are used. **972/250-1633; www.fibergrate.com.**



Dynarail handrail and ladder systems from Fibergrate Composite Structures

Skimmers



Alpha stainless steel skimmer from Megator

STAINLESS STEEL SKIMMER

The Alpha stainless steel skimmer from Megator removes wastewater scum from aeration tanks. Made of stainless steel, it can handle aggressive liquids at varying depths and concentrations. It has a lightweight design with one-man operation, an adjustable intake weir, a tri-float design for stability and a shallow draft that enables it to operate

in as little as 12 inches of water. The skimmer can be arranged for gravity flow in new construction, while complete recovery units are used for existing tanks. **800/245-6211; www.megator.com.**

Tanks

DOUBLE-WALL TANK

Cylindrical double-wall tanks from Assmann Corporation eliminate chemical spills without the expense of lined concrete containment. The molding process provides a heavier-top sidewall and dome to prevent dome collapse, while a primary inner tank and a secondary locked-on outer tank ensures against chemical spills. Constructed of molded high-density crosslinked polyethylene or FDA-compliant linear polyethylene, the outer shell containment equals 120 percent of primary tank capacities, exceeding EPA standards. The dome on the inner tank interlocks with the outer tank's sidewall, sealing the secondary containment area and preventing debris and snow from entering, making the system ideal for outdoor storage. The double-wall design also prevents cross contamination of contents. They are available in 20- to 6,550-gallon sizes. **888/357-3181; www.assmann-usa.com.**



Double-wall tanks from Assmann Corporation



Stainless steel tanks from Boerger

STAINLESS STEEL TANK

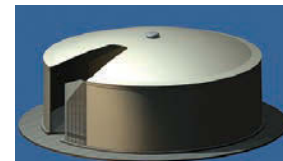
Stainless steel tanks from Boerger are used in the biogas industry as primary and secondary digesters and as equalization or storage tanks. The tanks are fixed to a concrete foundation using anchor bolts with sealing compound. They can be customized to meet specific needs, with capacities from 8,000 to

1.3 million gallons. They can be built high and narrow or low and wide. If more storage space is required in the future, additional ring segments may be added. Tanks can also be easily dismantled and rebuilt elsewhere. Options include ladders with safety cages, stairways and plat-

forms, tank covers, tank connections and flanges, tank access and manways. **612/435-7300; www.boerger.com.**

PRESTRESSED CONCRETE TANK

Wire-wrapped prestressed concrete storage tanks from Caldwell Tanks are economical units constructed to meet the requirements of AWWA D110 and ACI 372. They are a low-maintenance choice for a variety of applications, including potable water, municipal and industrial wastewater and thermal energy storage. **502/964-3361; www.caldwelltanks.com.**



Concrete storage tanks from Caldwell Tanks



Mix tanks from DEL Tank & Filtration Systems

MIX TANK

Mix tanks from DEL Tank & Filtration Systems are available in horizontal and vertical configurations in sizes from 1,000 to 33,000 gallons. They can hold up to 20-pound-per-gallon fluids using four 10 hp explosion-proof mixers. With a round bottom and smooth 1/4-inch-thick walls, the

bullet-style tanks promote uniform solid suspension and mixing that nearly eliminate build up. **800/468-2657; www.deltank.com.**

STORAGE TANKS

AWWA Standard D110 prestressed concrete storage tanks from DN Tanks are made using a cylindrical concrete wall placed in permanent compression. AWWA D110 Type I tanks are constructed using a cast-in-place concrete wall, horizontal strand prestressing and vertical post-tensioning. AWWA D110 Type III tanks are constructed using precast concrete walls, with an embedded steel diaphragm. The tank wall is also placed in permanent compression, accomplished by horizontal wire-wound prestressing. Either tank type can be built with roofs constructed as clear span, freestanding concrete domes, or with column-supported, conventionally reinforced flat slab roofs. Capacities range from 80,000 to 50 million gallons. **800/826-8306; www.natgun.com.**



Concrete storage tanks from DN Tanks



Folding frame tanks from Husky Portable Containment

FOLDING FRAME TANK

Folding frame tanks from Husky Portable Containment are available in steel or aluminum frames (single or double fold) with several size and material options. They are suited for potable or wastewater storage and firefighting. Easy-lift handles

are standard. The folding frames are also pinch-free, meaning no added pieces to get in the way. **800/260-9950; www.huskyportable.com.**

PORTABLE STORAGE TANK

Watertight, insulated T-Max tanks from Orenco Systems are portable, long-lasting, chemical-resistant fiberglass storage containers in capacities from 300 to 15,000 gallons. Standard tanks come in 14- to 42-foot lengths, weigh 4,000 to 12,000 pounds, and are 75 feet wide by 85 feet high. Custom sizes are available. Molded in a single piece using the vac-



T-Max tanks from Orenco Systems

uum infusion process, they are constructed of 4-inch-thick foam-cored fiberglass walls. The vacuum infusion process produces void-free, high strength fiberglass laminates and allows for encapsulation of foam core, providing an insulation value of R-24. **800/348-9843; www.orenco.com.**

ROLLED, TAPERED PANEL BOLTED TANK

The RTP (rolled, tapered panel) bolted tank from Tank Connection Affiliate Group is made to exact tolerances with sidewall plate thickness up to 1/2 inch. No external reinforcement webbies/web stiffeners are required; field construction is accomplished using a synchronized hydraulic screw jack process that keeps crews on the ground. Tanks are available in capacities up to 8 million gallons. **620/423-3010; www.tankconnection.com. tpo**



RTP bolted tank from Tank Connection Affiliate Group

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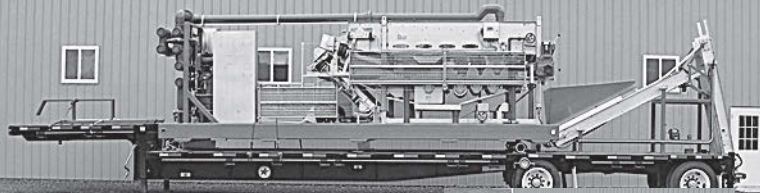
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By Craig Mandli

Microturbines process methane into energy

Problem

The Sheboygan (Wis.) Regional Wastewater Treatment Plant, which treats up to 15 mgd, had a surplus of biogas. More than 25 percent of the gas was being flared at the plant site. At the same time, the municipality wanted to reduce electricity costs.

Solution

Ten clean-burning biogas-fueled **C30 Microturbines from Capstone Turbine Corporation** generate up to 300 kW of electrical power (2,300 MWh per year). Heat recovery modules on each turbine capture exhaust heat, which is used to maintain the digesters 95-degree F temperature and heat buildings. A gas-cleaning system removes moisture and siloxanes from the raw gas.

RESULT

The ultra-low emission microturbines cut the plant's electric and natural gas bills by 40 percent, and earn renewable energy and emissions credits. The microturbines can recover 1 million Btu per hour, or about 73,000 therms per year — enough to heat 60 homes for a year. Despite a significant rise in rates, the plant's electric bill has seen little change. In addition, the plant has sold over 2,000 renewable energy credits. **818/734-5300; www.capstoneturbine.com.**



Covered sludge beds eliminate odor issues

Problem

The Northern Moraine Wastewater Reclamation District in Illinois serves three communities in the Island Lake area with a total population of 12,000. The district treats 1.1 mgd, discharging into a nearby river. The facility had stored treated and dried biosolids outside. "The material got wet every time it rained or snowed, causing odor concerns and raising handling costs," says operations supervisor Todd Sheridan. The facility needed covered storage space for the drying beds.

Solution

Sheridan discovered **Hercules Truss Arch Buildings from ClearSpan Fabric Structures** in a product catalog. He ordered two 65-by 70-foot buildings to cover the drying beds.

RESULT

Sheridan is pleased with the buildings. "They were assembled in less than a week," he says. "The light that comes through the covers is great." Both structures now store biosolids, but Sheridan says, "I'm sure we will find even more uses for the buildings down the road." **866/643-1010; www.clearspan.com.**



Flat aluminum tank covers solve odor challenges

Problem

The City of Wyoming, Mich., processes wastewater for 140,000 residents. The city needed a biosolids storage solution to control odor and allow expansion to serve a growing population.

Solution

The city installed a 120-foot-diameter concrete biosolids **storage tank with a truss-supported, extruded flat aluminum cover for odor containment, provided by CST Covers**. The aluminum weight-bearing design proved durable and corrosion-resistant. Facility operators also have walkable, slip-resistant access without a bridge. "The flat cover design significantly reduced foul air volume and allowed cost savings on the foul-air handling and odor-control system," says Jack Staat of CST Covers. The city also replaced two dome covers on biosolids tanks with flat aluminum covers and added truss-supported extruded flat aluminum covers for four 103-foot-diameter primary settling tanks and their open-top flow-splitting chambers. Those covers include nonstandard railings and manlift sockets at access hatches.

RESULT

"Once we understood the cover was weight bearing, our choice and installation became cleaner and simpler," says Tom Wilson, plant maintenance supervisor. "The flat cover provides better aesthetics and overall appearance." The entire project was allotted 12 months for completion but was finished in nine months. **913/621-3700; www.cstindustries.com.**



Tanks treat wastewater from air-quality system

Problem

Constellation Energy's Brandon Shores Power Plant in Baltimore, Md., was in need of new tanks that would adhere to strict air-quality guidelines, and provide appropriate processing, storage and treatment resources for handling wastewater from the plant's air-quality control system.

Solution

Fisher Tank Company worked with Bowen Engineering to design, fabricate and construct 14 field-erected welded steel tanks specially designed to support the emission control system. The tanks included clarifiers, reactor vessels, equalization tanks and holding tanks. Each was designed and fabricated in-house according to precise specifications. The company designed, fabricated and installed clarifier troughs, internal baffles and mixer platforms, as well as agitator bridges and rake supports. Crews also completed the project by field painting the tanks, and erecting two 85-foot tall, 48,000-pound shop-fabricated lime silos.



RESULT

In-house blasting and shop priming ensured that plate material arrived on site ready for construction and final coatings, contributing to the efficiency of the construction schedule and to the overall quality of the system. The upgrade to the plant reduces sulfur dioxide emissions by an estimated 95 percent and mercury emissions by 90 percent. **610/494-7200; www.fishertank.com.**

Tank-cleaning machine reduces grease buildup in stations

Problem

Virginia Public Works Equipment in Virginia Beach was struggling with grease buildup in its lift stations. The utility needed an effective way to resolve the cleaning issues without demanding more manpower and budget.

Solution

The utility purchased an **EZ-8 rotary impingement tank-cleaning machine from Gamajet**. The machine eliminates confined-space entry and delivers powerful impact cleaning. Powered by the department's jet-



(continued)

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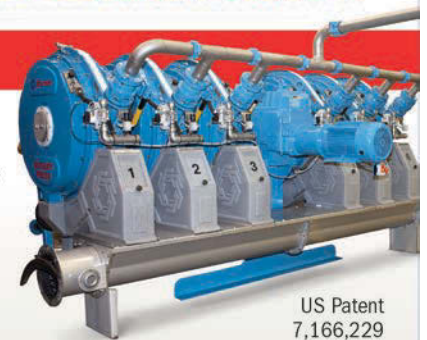
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ter and combination cleaning trucks, the unit was configured for 80 gpm/300 psi. The machine thoroughly cleans the wet well in 12 minutes. Another half cycle is run periodically to further decimate the grease pad, which is then suctioned into the cleaning truck or washed downstream.

RESULT

With the addition of the Gamajet machine, the utility can prevent buildup in their lift stations and provide better service to constituents with increased safety and less demand on resources. **877/426-2538; www.gamajet.com.**

Modular railing solves employee safety issues**Problem**

Located on an offshore island in Athens Bay in Greece, the Psytalia Wastewater Treatment Plant protects the Saronic Gulf and the general environment of the region. The plant is the largest in Europe and one of the largest in the world. It needed over 50,000 feet of safety railing to ensure a safe working environment. The railing needed to be versatile to accommodate the many angles and elevation changes around the perimeter.

Solution

The facility chose a **KeeKlump modular railing system provided by Kee Safety.**

**RESULT**

The system eliminated onsite welding and hot work permits and allowed for easy field modification to meet all job site requirements. It also eliminated the movement and installation of large offsite welded structures, saving time and expense. **800/851-5181; www.keesafety.com/us.**

Composite building panels provide solution for contact basins**Problem**

A group of tertiary treatment plants with open reclaimed water contact basins near the City of Oceanside in Southern California needed to minimize chlorine loss while preventing algal blooming from prolonged exposure to sunlight.

Solution

Strongwell provided a design that used its COMPOSOLITE structural building panels, with an internal core structure that can handle more weight and cover the reservoirs without extra structural support. The panels are affordable, do not corrode, and are safe to touch and walk on. The panels are 24 inches wide by 3 inches thick and are available in many lengths.



The panels are affordable, do not corrode, and are safe to touch and walk on. The panels are 24 inches wide by 3 inches thick and are available in many lengths.

RESULT

The lightweight, high-strength panels were delivered on one truck with minimal effort to off-load and store. Construction crews installed the panels on site with minimal field trimming and reduced labor costs. Project managers were pleased with the quality and ease of installation and said they would bid the product in future projects. **276/645-8000; www.strongwell.com.**

Crystalline chemical system waterproofs below-grade treatment system**Problem**

The Miami-Dade Water and Sewer Department recently upgraded the South District Wastewater Treatment Plant to a high-level disinfection facility with a peak flow capacity of 285 mgd, an increase of 27 percent. The plant is the largest domestic wastewater injection site, and one of the largest deep bed sand filter plants in the country. The contractor sought to waterproof the below-grade systems to ensure long-term durability.

Solution

Over 52,000 square feet of surface area was treated with a two-coat **crystalline chemical system manufactured by Xypex Chemical Corporation** to waterproof and protect the transfer pump station, flocculation tanks and filters. The second phase incorporated crystalline technology as an admixture for waterproofing and protection of an oxygenation train, four new clarifiers, associated splitter boxes and a pump station. An estimated 400,000 pounds of the product was used for a substantial portion of 70,000 cubic yards of poured-in-place concrete.

**RESULT**

Crystalline waterproofing enhanced the structural durability of the concrete and lowered the life cycle maintenance costs of the entire system including clarifiers, pump stations and flocculation tanks. **800/961-4477; www.xypex.com. tpo**

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1. VAL-MATIC SWING CHECK VALVE

The AWWA swing check valve from Val-Matic Valve & Manufacturing Corp. is designed for municipal and industrial water and wastewater applications. The valve prevents backflow by automatically closing when fluid reverses direction. Features include a ductile iron disc that swings open upon pump startup. When closed, the valve provides a tight shutoff through the field-replaceable stainless steel seat. Valves are available with three closure options (lever and weight, air cushion, lever and spring) and 2- to 24-inch and 30- to 48-inch sizes. **630/941-7600; www.valmatic.com.**

2. BINMASTER BENDABLE CAPACITANCE PROBE

The bendable capacitance probe from BinMaster Level Controls is designed to fit tight spaces or in vessels where obstructions prevent the installation of a straight probe. Mounted on the side of the bin, the probe can be used in solid materials or slurries and will not interfere with two-way radios or other equipment operating in the radio spectrum. **800/278-4241; www.binmaster.com.**

3. SAGE THERMAL MASS FLOWMETER

The Basic thermal mass flowmeter from Sage Metering features low power consumption and can be used for any gas. The meter has an all-stainless steel probe or inline sensor, 4-20 mA signal and pulse output. **831/242-2030; www.sagemetering.com.**

4. XYLEM MULTIPARAMETER INSTRUMENTS

MultiLab IDS laboratory instruments and smart sensors for the water and wastewater industry from YSI, a xylem brand, can measure three parameters at a time — pH, ORP, BOD or conductivity — or three of the same parameters. The MultiLab line includes the 4010-1 (one channel), 4010-2 (dual channel) and 4010-3 (three channel) as well as smart digital probes for optical-based BOD5, pH, ORP and conductivity measurement. **800/897-4151; www.ysi.com.**

5. OPTO 22 GROOV INTERFACE APP

The groov View for iOS and Android apps control how groov browser-based operator interfaces are displayed on smartphones, tablets and other devices. The apps are an optional part of Opto 22's groov, a way to securely build and deploy Web-based operator interfaces for automation, monitoring and control applications. **800/321-6786; www.opto22.com.**

6. ENERPAC EVO SERIES LIFTING SYSTEM

The EVO Series synchronous lifting system from Enerpac combines high-pressure hydraulics with a programmable PLC system to monitor and control precise movement and positioning of heavy loads. Through an integrated HMI (human machine interface), all movements are managed from a central control position that displays live operation with real-time status updates for each lifting position. The lifting system can be used with standard 10,000 psi single- or double-acting cylinders and is offered with a 5 hp or 10 hp hydraulic power unit and 66-gallon reservoir. The system has eight hydraulic control modes and can control four, eight, or 12 points with one hydraulic power unit. **262/293-1600; www.enerpac.com.**

7. WILO HORIZONTAL SPLIT CASE PUMP

Horizontal split case pumps from WILO USA are available in 64 models. Sizes range up to 500 hp, heads to 750 feet and flows to 15,000 gpm with a temperature range of 18 to 250 degrees F. The horizontal split casing enables bearings and the mechanical seal to be replaced without disturbing system piping. Other features include hydraulically balanced double-suction impeller for minimal axial thrust, tongue-and-groove neck that eliminates rotating assembly seizing and permanently lubricated, single-row bearings. **866/945-6872; www.wilo-usa.com.**

8. FLUID COMPONENTS INTERNATIONAL ANALYZER FLOW SWITCH/MONITOR

The FS10A analyzer flow switch/monitor from Fluid Components

International meets requirements for safety integrity level (SIL) 2 compliant service and classified as a Type B subsystem in accordance to IEC 61508-1 with a hardware failure tolerance of 0. The instrument's wetted parts are corrosion-resistant 316L stainless steel with Hastelloy-C22 sensor tips. **800/854-1993; www.fluidcomponents.com.**

9. FLO-CORP WIRELESS MONITORING SYSTEM

The Guardian 2000 wireless monitor from FLO-CORP transmits data using cell towers and/or satellites and a global positioning system (GPS) satellite chip. The battery-powered system can be used to report combined sewer overflows (CSO) measured by the Ranger 1000 ultrasonic level transmitter, providing constant access to data. The wireless monitor also can report exact tank truck locations, noting flow into the tank truck during pickups, flow out during deliveries, tank level and product temperature. **877/356-5463; www.flowlineoptions.com.**

10. LOWELL VALVE KEY SOCKETS

Three-size valve key sockets from Lowell Corp. can handle from 1 13/16-inch Boston gates nuts to 2-inch standard square nuts. The kit includes compact case, attachment plate and 3-inch screw for mounting the socket on any standard key. **800/456-9355; www.lowellcorp.com.**

11. SENSOREX FREE CHLORINE SENSORS

FCL500 series free chlorine sensors from Sensorex Corp. use amperometric measurement technology to monitor free chlorine in process applications. With three models covering the 0-2 ppm, 0-5 ppm and 0-10 ppm ranges, the sensors can be used in new installations or as a field

replacement for existing sensors in drinking water disinfection, distribution and industrial water treatment systems. The sensors interface with PLC, SCADA and other process control systems via 4-20 mA output. **714/895-4344; www.sensorex.com.**

12. SINGER SINGLE-POINT INSERTION FLOWMETER

The model 106-SPI-MV single-point insertion electromagnetic flowmeter from Singer Valve, in partnership with McCrometer, can be utilized with the metering valve as a stand-alone option or built into a 106-2SC-PCO pilot system to provide complete flow-based valve control. The insertion probe extends into the flow stream in one of the valve inlet connections and protrudes into the valve, equivalent to one-eighth of the valve diameter. The bullet nose eliminates clogging or buildup and has no moving parts. The unit can be installed on any Singer Valve models from 4 to 36 inches. **604/594-5404; www.singervalve.com.**

13. PRECISION DIGITAL PANEL METERS

Trident Series digital panel meters (model PD765 and PD8-765) from Precision Digital Corp. feature two relays, 4-20 mA analog output and 24-volt DC power supply. The PD765 is housed in a 3.6-inch deep, 1/8 DIN enclosure with NEMA 4X front panel. Two display heights are available: 0.56 inch (Trident) and 1.2 inch (Trident X2). Each display is adjustable to lighting conditions, including direct sunlight, enabling the meter to be read from 30 feet. For hazardous applications, the PD8-765 has an explosion-proof, die-cast aluminum enclosure with through-glass Safe Touch buttons and worldwide agency approvals. **800/343-1001; www.predig.com.**

(continued)

product spotlight

Odor control system uses no chemicals or media

By Ed Wodalski

The **Terminodour** odor control system from **CSO Technik, distributed in North America by Kusters Water, division of Kusters Zima Corp.** (Spartanburg, S.C.), neutralizes odor at its source. Ionized air is pumped into the building, where it reacts and oxidizes odors, while maintaining a healthy work environment for operators. It uses no water, chemical or media.

"Most odor control systems extract and scrub odor from the gas stream. Terminodour generates negatively charged oxygen molecules and delivers them into the source of the odor, be it a building or a tank," says Colin Froud, CEO, CSO Technik. "The odors are then oxidized by contact with the ionized air."

Fresh air is drawn by a fan into the Terminodour system via an external louver and filtered to remove particles. The filtered air is passed into the plasma reaction chamber where hydrogen and oxygen molecules are electrically charged in a 5:4 ratio. The resulting ions are distributed throughout the building according to the location and severity of odor emission points.

Odor reductions of 80 to 95 percent can be achieved within a building and up to 99 percent in storage tank and wet well applications.

"Most of our 200-plus installations are in the wastewater sector," Froud says. Typical applications are headworks, wet wells, pumping stations and EQ basins. "We have also installed systems in sludge treatment centers, although typically we provide combination systems incorporating the Terminodour with scrubbing systems in this type of application for an effective, low-cost solution.

"On a recent project we were able to offer greater than 50 percent reduction against the cost of a chemical scrubber with operational costs about 25 percent of the chemical scrubber system," Froud says.

The odor control system has a small footprint and requires minimal maintenance. "The improved air quality also results in greatly reduced sulphide-inspired corrosion of concrete and plant control panels," Froud says.

The system is designed to control hydrogen sulphide, mercaptans, DMS (dimethyl sulfide), DMDS (dimethyl disulfide), amines and other wastewater-related gasses.

The modular unit can be sized to meet plant needs. Quarterly maintenance of the inlet filters and ionizing tubes requires no specialized tools or training. Odor control systems are available for rent or trial usage. **800/264-7005; www.kusterswater.com.**



Terminodour odor control system from CSO Technik (distributed by Kusters Water)



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14. AIR SCIENCE VENTED ENCLOSURES

Vented enclosures from Air Science USA contain airborne particles during manipulation and transfer of potent compounds. The turbulent-free design utilizes ductless technology in combination with carbon/HEPA filtration. No additional HVAC is required. Custom sizes are available. **239/489-0024; www.airscience.com.**

15. TIDEFLEX CURVED BILL CHECK VALVE

The TF-1 check valve from Tideflex Technologies has a bill formed into a curve that returns to a closed position, sealing against backflows, including low flow rates. The flat bottom design allows for installation where the invert of the pipe is close to the floor. **412/279-0044; www.redvalve.com.**

16. KROHNE OPTIWAWE 5200 RADAR LEVEL METER TOOLS

The Optiwave 5200 C/F radar level meter from KROHNE is designed for liquid applications in a 98-foot measuring range. The GHz FMCW, 2-wire, loop-powered device measures up to 580 psi in general purpose and hazardous locations (Class 1, Division 1). The system's PP and PTFE wave horn antennas are process sealed and gasket free, making them suited for corrosive conditions. The PP antenna can be mounted on process connections as small as 1 1/2 inches. The metallic horn and wavelength antennas use a dual-seal mechanism, O-ring and Metaglas process interface for a hermetic seal in toxic or explosive applications. **800/356-9464; http://us.krohne.com.**

17. ORENCO PREFABRICATED FIBERGLASS SHELTERS

Prefabricated fiberglass shelters from Orenco Systems are designed to house and protect mechanical and electrical controls, process equipment, chemicals and workers. Standard sizes are 8 feet tall, 4 to 16 feet wide and up to 42 feet long. Custom widths and heights are available. Shelters are made of foam-core fiberglass walls, close-molded for a watertight bond and coated with UV-stable gelcoat. Roofs can handle up to 100 psf and, when properly anchored, resist winds up to 130 mph. Standard walls and ceilings range from 2 to 4 inches thick with insulation values of R12 to R24. **800/348-9843; www.orenco.com.**

18. RAIN FOR RENT TDH CALCULATOR APP

The TDH calculator mobile app from Rain for Rent can be used by engineers, field operators and technicians to determine pump selection.

The free app can be downloaded from iTunes. **800/742-7246; www.rainforrent.com.**

19. BADGER METER UTILITY MANAGEMENT SOFTWARE

ReadCenter AnalyticsPro and ReadCenter Analytics+ software from Badger Meter provides water and gas utilities with access to metrics and information for efficient operation. When coupled with Advanced Metering Infrastructure hardware, the software helps utilities optimize operations for increased productivity. The enhanced dashboard enables water utility personnel to view potential issues such as leaks, tampering, no usage, reverse flow and endpoints that are reaching the final days of useful life. Users also can click to see condition details. **800/876-3837; www.badgermeter.com.**

20. WILDEN AIR DISTRIBUTION SYSTEM

The Pro-Flo SHIFT air distribution system (ADS) from Wilden Pump & Engineering, part of the Pump Solutions Group, is made for use in Advanced Series bolted and Original Series clamped air-operated double diaphragm (AODD) pumps, enabling them to reduce air consumption by 60 percent. The pump is available in 1 1/2-, 2- and 3-inch sizes with discharge pressures to 125 psig and maximum flows of 243 gpm. They can handle up to 1/2-inch solids and are available with suction lifts of 23 feet (dry) and 30.6 feet (wet). **909/422-1730; www.wildenpump.com.**

21. OLDHAM FIXED GAS MONITOR

The iTrans 2 fixed gas monitor from Oldham, An Industrial Scientific Company, detects explosive gases, toxic gases or oxygen. The intelligent electronics platform provides one or two points of detection from a single head. When in RS485 bus configuration, one system is capable of accommodating more than 200 transmitters and can monitor any combination of gases for a specific environment. Other features include non-intrusive calibration, HART and Modbus communication, programmable relays and explosion-proof aluminum or stainless steel housings. **800/338-3287; www.oldhamgas.com.**

22. GRUNDFOS ENERGY-OPTIMIZED CIRCULATOR PUMP

The MAGNA3 energy-optimized circulator pump from Grundfos Pumps has a variable-speed wet rotor with adaptive intelligence for reduced power consumption. Software enables the pump to automatically determine the lowest possible operating efficiency point to meet



ever-changing demand. The pump handles temperature down to 14 degrees F, delivers approximately 570 gpm and head to 60 feet. **800/921-7867; <http://us.grundfos.com>.**

23. AQUA-AEROBIC MICROFIBER PILE CLOTH

The OptiFiber PES-14 microfiber pile cloth filtration media from Aqua-Aerobic Systems is engineered to remove suspended solids, turbidity and fine particles, reducing total phosphorus to 0.1 mg/L or less. The media is approved by the California Department of Public Health for use in high-quality wastewater reuse applications. **800/940-5008; www.aqua-aerobic.com.**

24. HACH LEVEL, VELOCITY SENSORS

US9001 down-looking and US9003 in-pipe ultrasonic level plug-and-play sensors from Hach Flow Meter Products, part of the FL900 flow meter line, feature immediate data visibility with wireless loggers and FSDATA Web-based software and redundancy options with up to four sensor connections. **800/368-2723; www.hachflow.com.**

25. BENKO MEZZANINE SAFETY GATE

Protect-O-Gate Clear Aisle mezzanine safety gates from Benko Products feature a double-gate design and three-sided load access to ensure against falls and other accidents associated with mezzanines and loading areas. The OSHA-compliant gates require 10 inches of floor space when closed at the mezzanine ledge and are counterbalanced for ergonomic, easy manual operation. Optional powered operation includes remote controls. Units can be customized to accommodate various load and space restrictions. **440/934-2180; www.benkoproducts.com.**

26. VICTAULIC DIRECT GROOVE, TWO-PIECE COUPLING

Rigid and flexible Advanced Groove System couplings from Victaulic are designed for piping systems up to 60 inches in diameter. They install in less than an hour and offer pressure ratings up to 350 psi. **610/559-3300; www.victaulic.com.**

27. OMEGA MINI PLASTIC FLOW SWITCH

The FSW-120 series of compact PPS switches from Omega Engineering are designed for use with water and water-based solutions and high-volume OEM applications, including coolant or chemical monitoring. Switch points are based on water flow. **800/826-6342; www.omega.com.** **tpo**

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WILO names national sales manager, opens Georgia Center

WILO USA promoted Harold Adams to national sales manager for its water management sector. He succeeds Joseph Melton who passed away in April. Adams has worked for Wilo since 2009, most recently as northeast regional sales manager. The company also opened a 61,625-square-foot distribution center in Thomasville, Ga.



Harold Adams

Alfa Laval acquires Niagara Blower

Alfa Laval acquired heat transfer company Niagara Blower of Buffalo, N.Y., known for its Wet Surface Air Cooler technology.

Global Polymer acquires Perlastic product line

Global Polymer Solutions acquired the Perlastic line of industrial protective coating products. The water-based, zero-VOC coatings adhere directly to rust or substrates with limited surface preparation and are suitable for application in confined spaces.

Gorman-Rupp names rental sales manager

Gorman-Rupp Co. promoted Jamie Schoenian to rental sales manager. He will be responsible for sales, service, aftermarket, technical support and product forecasting between Gorman-Rupp and National Rental accounts.



Jamie Schoenian

Calgon receives fifth patent for FLUEPAC technology

Calgon Carbon Corp. was granted a fifth U.S. patent for its FLUEPAC technology. Patent 8,450,238 relates to the company's FLUEPAC ST and STF products for flue gas treatment. The products remove mercury from systems where acid gases, such as SO₂, are present.

Kaeser Compressors opens Philadelphia office

Kaeser Compressors opened a factory-direct facility in the greater Philadelphia area. The branch office offers air system audits, design and installation, new equipment sales, preventive maintenance and repair services.

Vacon North America opens headquarters facility

Vacon North America, manufacturer of AC drives, relocated to a larger facility at 310 W. Wisconsin Ave., Milwaukee, Wis. The 12,481-square-foot office and training facility can accommodate groups up to 44 and includes a product training lab and product showcase.

Pump Solutions Group names vice presidents

Pump Solutions Group, a business unit within Dover Corp., named John Pepper vice president of integration; Andrew Usuki vice president, sales and business development, Americas; and Tomas Valencia vice president, sales and business development, EMEA. Pepper will be responsible for driving the global integration of Brookvale, Australia-based Ebsray Pumps, a regenerative turbine, sliding vane and gear pump manufacturer acquired by PSG. Usuki, previously vice president of PSG's vertical market, will replace Pepper. Valencia will be responsible for sales and business development in Europe, the Middle East and Africa for PSG companies.



Andrew Usuki



Tomas Valencia

Xylem acquires dewatering business

Xylem acquired Pollmann Pumpen Ltd., a privately owned German-based dewatering technology and services company, for approximately \$3 million.

Woodard & Curran names vice presidents

Woodard & Curran named four vice presidents to the engineering firm. Paul Couture, PMP, is senior project manager in the Providence, R.I., office. He is responsible for control system design and programming. David Prickett, P.E., is senior project manager for water and wastewater treatment and infrastructure projects, supporting municipalities in Connecticut and Massachusetts. Rebecca Talbert, assistant counsel, is an attorney in the Portland, Maine, office. Carl Wilcox, P.E., is senior project manager in the Portland office.

Red Valve offers product catalog

Red Valve's 28-page product-line catalog includes pinch valves, check valves, air diffusers, expansion joints and other flow control products. The catalog is available by calling 412/279-0044 or visiting www.redvalve.com.



Franklin Electric rebrands Cerus Industrial

Franklin Electric rebranded its latest acquisition, Cerus Industrial, as Franklin Control Systems. Based in Hillsboro, Ore., the company will focus on the design and production of electronic drives and controls for water pumping and industrial systems. Products made by Franklin Control Systems will carry either the Franklin Electric or Franklin Control Systems brand.



Grundfos opens Indianapolis customer center

Denmark-based Grundfos celebrated the 40th anniversary of its presence in the United States and 90th anniversary of its Peerless Pump brand with the official opening of its welcome and customer center in Indianapolis.

ARCADIS names vice presidents

ARCADIS promoted 10 staff members to vice president. Jack Hartigan, P.E., BCEE, and Barry Quinn were named senior vice presidents. Wendy Stoveland was promoted to vice president and Amy R. Dant, Edward Kowalski, P.E., PMP, Carolyn A. Lowe, P.E., Sandra K. Ralston, Mike Wooden, P.E., and Anwar Zahis, Ph.D., were promoted to associate vice president. **tpo**

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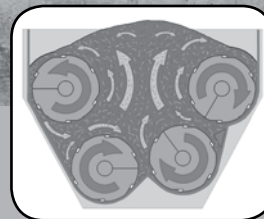
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people/awards

Rick Stautz retired as director of public works for the City of Shawano (Wis.) after 30 years with the city (25 years heading up the Department of Public Works and five years as an engineer with Shawano Municipal Utilities).

The **City of Raleigh (N.C.) Public Utilities Department's Wastewater Treatment Division** was awarded the 2013 Excellence in Management Gold Award from the National Association of Clean Water Agencies for its commitment to sustainability, resiliency and innovation.

The **Little Creek, Smith Creek and Neuse River Wastewater Treatment Plants** in North Carolina received Peak Performance Awards from the National Association of Clean Water Agencies.

The Maine Wastewater Control Association announced that **Sofie Irons** (first place), **Nick Rocray** (second place) and **Faith Ledger** (third place) were winners in its poster competition, "What Clean Water Means to Me," for students in grades 3-8.

City of Washington (Iowa) officials were honored by Alliant Energy at the 2013 Iowa Energy Summit for their efforts to incorporate energy-saving methods and technologies during the construction of their new wastewater treatment facility.

Gresham, Smith and Partners received the Grand Award for the Water and Wastewater category in the American Council of Engineering Companies of Tennessee's 2013 Engineering Excellence Awards competition.

Denman Braun from the Alexandria Lake Area Sanitary District was recognized by the Minnesota Pollution Control Agency for maintaining a perfect record of compliance with the plant's wastewater treatment permit.

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

Alabama

The Alabama Water Environment Association has a Collection System Operators Seminar Dec. 17 in Tuscaloosa. Visit www.awea-al.com.

California

The California Water Environment Association is offering these courses:

- Oct. 17 – Elements of a Winning Collection System Seminar, Belmont
- Nov. 13 – Collection System Benchmarking, location TBD

Visit www.cwea.org.

Florida

The Florida Water Environment Association has a Fall Wastewater Process Seminar Nov. 5, in Winter Haven. Visit www.fwea.org.

The University of Florida TREEO Center is offering these courses in Gainesville:

- Oct. 15-16 – Sequencing Batch Reactor Operation: Make It Work for You
- Oct. 29-31 – Microbiology of Activated Sludge
- Nov. 5-6 – Flow Meter Calibrations
- Nov. 13 – Energy Conservation at Water and Wastewater Treatment Facilities

- Nov. 14 – Science of Disinfection
 - Jan 14-16 – Introduction to Electrical Maintenance
 - Jan. 21-23 – Process Control of Advanced Waste Treatment Plants
- Visit www.treeo.ufl.edu/wastewater-courses.aspx.

Illinois

The Illinois Water Environment Association is offering these courses:

- Nov. 14 – Collection Systems Seminar, Lisle
- Nov. 21 – Biosolids Seminar, location TBA

Visit www.iweasite.org.

Michigan

The Michigan Water Environment Association is offering these courses in East Lansing:

- Oct. 30 – Health and Safety Seminar
- Nov. 6 – Process Seminar

Visit www.mi-wea.org.

Missouri

The Missouri Water Environment Association has a Fall Technical Conference Nov. 7, in Columbia. Visit www.mwea.org.

Nebraska

The Nebraska Water Environment Association has a Wastewater Certification Training session Oct. 7-9, in Lincoln. Visit www.ne-wea.org.

New Hampshire

The New England Water Environment Association has a Northeast Biosolids and Residuals conference in Concord Oct. 29-30. Visit www.newea.org.

New York

The New York Water Environment Association is offering these courses:

- Oct. 23 – Portable Pumps: Uses, Sizing and Planning, Babylon
- Nov. 6 – Clarifier Optimization and Flow Measurement, Lyons
- Nov. 7 – Clarifier Optimization and Flow Measurement, Ithaca
- Nov. 8 – DMR-Electronic Reporting and Proper Completion, Rexford

Visit www.nywea.org.

Ohio

The Ohio Water Environment Association is offering a Biosolids Workshop Dec. 5 at Lewis Center. Visit www.ohiowea.org.

Pennsylvania

The Pennsylvania Water Environment Association is offering these courses:

- Oct. 3 – Collections Systems Workshop
- Oct. 25 – Safety Workshop
- Nov. 6 – Laboratory Workshop

Call 570/549-2204 or visit www.pwea.org.

Texas

The Texas Water Utilities Association is offering the following courses:

- Oct. 21 – Activated Sludge, Corpus Christi
- Nov. 4 – Wastewater Collection, Corpus Christi
- Nov. 19 – Calculations, Victoria
- Nov. 19 – Management, Gatesville

Visit www.twua.org.

Wisconsin

The University of Wisconsin Department of Engineering-Professional Development has a Sanitary Sewer and Collection System Engineering Seminar Dec. 3-5 in Madison. Visit <http://epdweb.engr.wisc.edu>. **tpo**

(continued)

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- Total Ammonia Measurement
- Optional Free and Monochloramine Measurement

Toroidal Conductivity

Non-Contacting Conductivity System



The Q46CT Monitor employs an inductive (toroidal) sensor that allows measurement in difficult samples with virtually no maintenance. The toroidal sensor is a molded assembly made from Noryl, an engineering thermoplastic with excellent resistance to both strong acids and strong bases.

FEATURES

- Good Performance in Dirty Applications
- Multiple Monitoring Configurations
- Easy Calibration

Dissolved H₂S Monitor

Keep Chemical Costs Under Control



The Q46S/66 Monitor take a unique approach to the measurement, employing a unique gas phase method to continuously monitor sulfite values without contact between the sensor and the water sample.

FEATURES

- Gas Phase Sensing - No Contact Between Sensor & Sample
- Internal Sequencing & Relay for Auto Sample Line Cleaning
- Low Maintenance & Low Reagent Usage

Total Chlorine Measurement

Amperometric Measurement



The Q46H/79 provides highly accurate measurement of total residual chlorine down into the parts per billion range. Total Chlorine is measured using EPA recommended method for reaction of the sample with buffer and KI.

FEATURES

- Direct Reading Membraned Amperometric Iodine Sensor
- High Accuracy and Sensitivity Down to PPB
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Toxic & Combustible Transmitter

Internal Data Logger



Model D12 Gas Transmitters provide the ultimate in application flexibility. Loop-powered or 3-wire models with on-board relays are available, as are both combustible gas and universal toxic gas versions. Digital communication using Hart™ or Modbus™ protocols are available.

FEATURES

- Interchangeable "Smart Sensors"
- Internal Data-Logger
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Portable Gas Leak Detector

Interchangeable "Smart Sensors"



PortaSens II C16 Detector provide a flexible tool for locating the source of toxic gas leaks from storage cylinders, process machinery, gas generation equipment or piping systems. Smart interchangeable sensors allow one instrument to be used for a variety of gas detection requirements. Data-logger come standard.

FEATURES

- Interchangeable "Smart Sensors" for Over 30 Gases
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Automatic Sensor Cleaner



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CALENDAR OF EVENTS

Sept. 29-Oct. 1

Atlantic Canada Water & Wastewater Association Annual Conference, Crown Plaza, Fredericton Convention Center, New Brunswick. Visit www.acwwa.ca.

Oct. 5-9

2013 Water Environment Federation Technical Exhibition and Conference, McCormick Place South, Chicago. Visit www.weftec.org.

Oct. 22-25

Wisconsin Wastewater Operators Association Annual Conference, Holiday Inn, Stevens Point. Visit www.wwoa.org.

Nov. 12-13

Georgia Association of Water Professionals Fall Conference and Expo, Athens. Call 770/618-8690 or visit www.gawp.org.

Nov. 20-22

Indiana Water Environment Association Annual Conference, Indianapolis. Visit www.indianawea.org.

Jan. 21-22, 2014

Water Environment Association of Texas Collection Systems Conference and Expo. Visit www.weat.org.

Feb. 25-28

Water Environment Federation 2014 Utility Management Conference. Call 703/684-2441 or visit www.wef.org.

April 27-30

Arkansas Water Works and Water Environment Association Annual Conference, in Hot Springs. Visit www.awwea.org.



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GENERAL MANAGER: Loudoun Water, a public utility located in Ashburn, Virginia is actively recruiting for a General Manager. For further information visit <http://www.loudounwater.org>. Resumes will be received at Loudoun Water, GM Apply, PO Box 973, Ashburn VA 20146 or at GM-apply@loudounwater.org. Confidentiality will be respected. The position will be an appointment by the Board of Directors and will remain open until filled. Employment terms are negotiable. (o10)



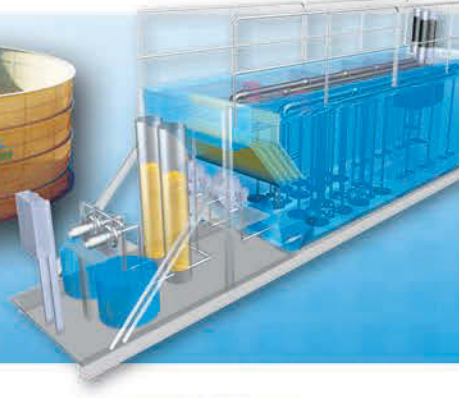
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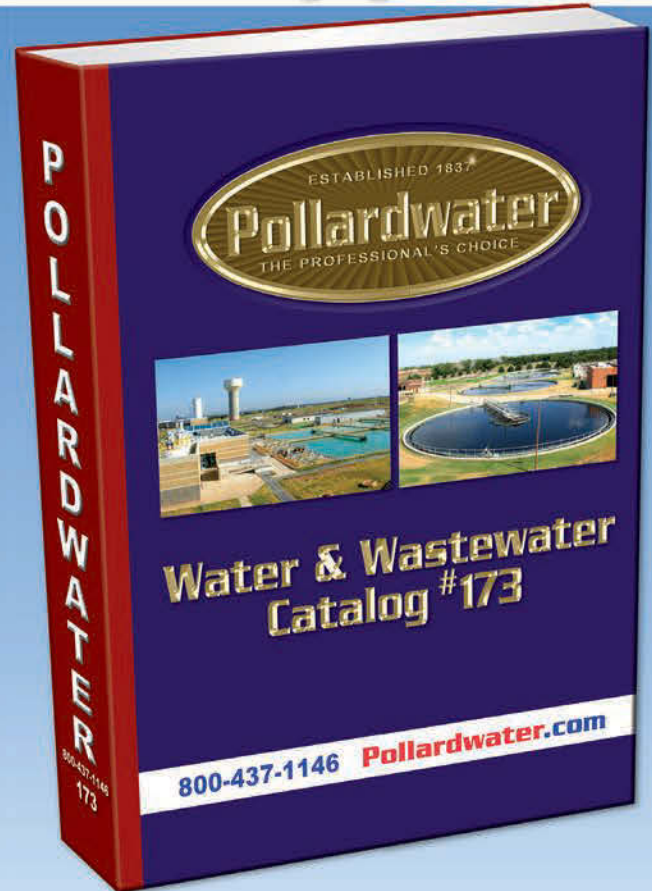
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