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**How We Do It:
Cutting power bills
with a hydroturbine**

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Treatment & Transport Show

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Michael Buchholzer
Director of Environmental Services
Yorkton, Saskatchewan

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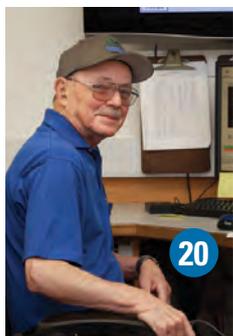
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on the cover

When leaders in the Saskatchewan city of Yorkton planned to upgrade an aging water treatment plant, they started with a survey of customers. "We made the community aware that we wanted to build this new plant and we needed their input," says Michael Buchholzer, director of environmental services. The result is an award-winning facility. (Photography by Devin Wilger)

top performers:

WASTEWATER: PLANT Page 12

Nine Safe Years and Counting

A Kentucky plant achieves an incredible run without a lost-time accident and wins a governor's safety award, while also boosting efficiency and improving operations.

By Trude Witham

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Challenges Met

The Yellow Springs team finds the funds and makes the improvements to produce quality effluent, meet strict phosphorus limits and handle peak flows.

By Jim Force

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Pushing the Envelope

Sid Fredrickson's award-winning career in Coeur d'Alene has been a continuous quest for more efficient and effective technology and treatment.

By Ted J. Rulseh

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From the Bottom Up

Community residents' input helps a Saskatchewan utility design an innovative water treatment system with sensitivity to cost and local needs.

By Trude Witham

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It's a People Business

Technology matters in the water treatment professions. People matter more, especially when those people form strong teams at their facilities.

By Ted J. Rulseh, Editor

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The Most Credible Voices

The Virginia Biosolids Council finds that farmers are the most effective sources for conveying information about land application to often skeptical citizens.

By Craig Mandli

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Gains by Gravity

A small Oregon water treatment plant breaks new ground with a custom-built hydroturbine that saves on electricity costs.

By Scottie Dayton

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Not Just for the Big Guys

Doug Ouellete believes teamwork is all the more important at smaller facilities. Lessons from a management boot camp helped him build a solid team.

By Ann Stawski

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River, River on the Wall

Students paint a mural in a Mississippi treatment plant's administrative building to call attention to the importance of protecting water resources.

By Jeff Smith

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Making Wind Affordable

The Field's Point Wastewater Treatment Facility expects to save more than \$1 million per year through a wind energy project funded by low-interest loans.

By Doug Day

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Built for the Field

A hand-held multiparameter digital system facilitates spot sampling for monitoring groundwater, reservoirs, receiving streams and other waters.

By Ted J. Rulseh

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Budding country music star Cole Swindell headlining the WWETT Show Industry Appreciation Party.

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coming next month: March 2015

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- » Top Performers:
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 - Wastewater Plant: Recovery from an epic flood in Clarksville, Tenn.
 - Wastewater Plant: Back to public operation in Biddeford, Maine
 - Wastewater: Central processing in Ontario's Niagara Region
- » How We Do It: Indirect water reuse in Orange County, Calif.
- » Hearts and Minds: WaterFest event in Charleston, W.Va.
- » Building the Team: Succession planning in Blacksburg, Va.
- » Sustainable Operations: Guaranteed savings in Highland, Calif.
- » In My Words: Promoting technology advancement in southern Ontario
- » PlantScapes: Community mural art in Bemidji, Minn.
- » Technology Deep Dive: Compressible media filter from WesTech Engineering

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It's a People Business

TECHNOLOGY MATTERS IN THE WATER TREATMENT PROFESSIONS. PEOPLE MATTER MORE, ESPECIALLY WHEN THOSE PEOPLE FORM STRONG TEAMS AT THEIR FACILITIES.

By Ted J. Rulseh, Editor



Technology has changed the water treatment industry for the better. It allows tighter process control. It frees people from mundane, repetitive, miserable tasks (who really wants to clean a bar screen?) and lets them put their ingenuity to work on bigger issues. It helps plants meet ever-stricter regulatory standards.

Still, automated processes aside, in-line instrumentation aside, SCADAs and PLCs and feedback loops aside, this is a people business and always will be. Right now, the “gray wave” of operators nearing retirement means the professions need new talent. The members of the next generation need to learn processes and

technology and acclimate to plant and industry cultures.

So above and beyond being capable technicians, leaders in today’s drinking water and wastewater treatment plants need to be teachers and team builders. As they turn their thoughts toward eventually retiring, they need to prepare those who will follow them. Formal training programs are fine, but the best learning happens on the job.

A NEW TPO FEATURE

With that thought in mind, *TPO* with this issue introduces an occasional series, “Building the Team.” Here we’ll highlight plants and plant leaders with outstanding records for pulling people together into highly effective units.

The first example is Jamestown (R.I.) Wastewater Treatment Facility, where Doug Ouellette, superintendent, knows teamwork isn’t just for big facilities. In fact, it may matter all the more when a staff is small.

Ouellette observes, “We all work well together — we have to. At larger facilities there may be people who stay with specific tasks. But in our smaller department, we have to be more versatile with a large knowledge base. We do everything ourselves.”

Ouellette worked his way up through the ranks of the profession and is in his 15th year heading up the facility. He knows what needs doing, and he knows how to get every-



DEDICATED TO WASTEWATER & WATER TREATMENT PROFESSIONALS

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

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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: 71,813 copies per month.

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thing done by putting his team members' collective skills to work and by making sure each one acquires all the necessary training.

THE POWER OF TEAMS

Teamwork matters because it makes the whole more than the sum of its parts. On a cohesive team, everyone is there to pick the others up. To fill in when someone is sick or on vacation. To collaborate on solving a persistent problem. To devise ingenious ways to save money or energy in the interests of customers. To keep the facility functioning through a major construction project or equipment retrofit.

Teamwork matters because it makes the whole more than the sum of its parts. On a cohesive team, everyone is there to pick the others up. To fill in when someone is sick or on vacation. To collaborate on solving a persistent problem.

And of course to pull together when things get difficult. For one example, technology won't help much when a disabling storm comes to town. When the plant is flooded and the power is down, it's people and teams who work around the clock to make things right, people and teams who line up emergency pumps and generators, people and teams who do the cleanup and get the facility back up and running and in compliance.

Most of all, though, it's people and teams using technologies as tools who keep plants running day to day, supplying communities with clean and safe water, protecting the streams and lakes against pollution, and safeguarding public health.

SHARE YOUR STORY

As with most of our regular features, *TPO* invites ideas for the "Building the Team" feature. Does your plant have a highly successful training, mentoring, coaching or other staff development program? Or is there a neighboring plant whose staff development initiatives you admire? Let us know about it.

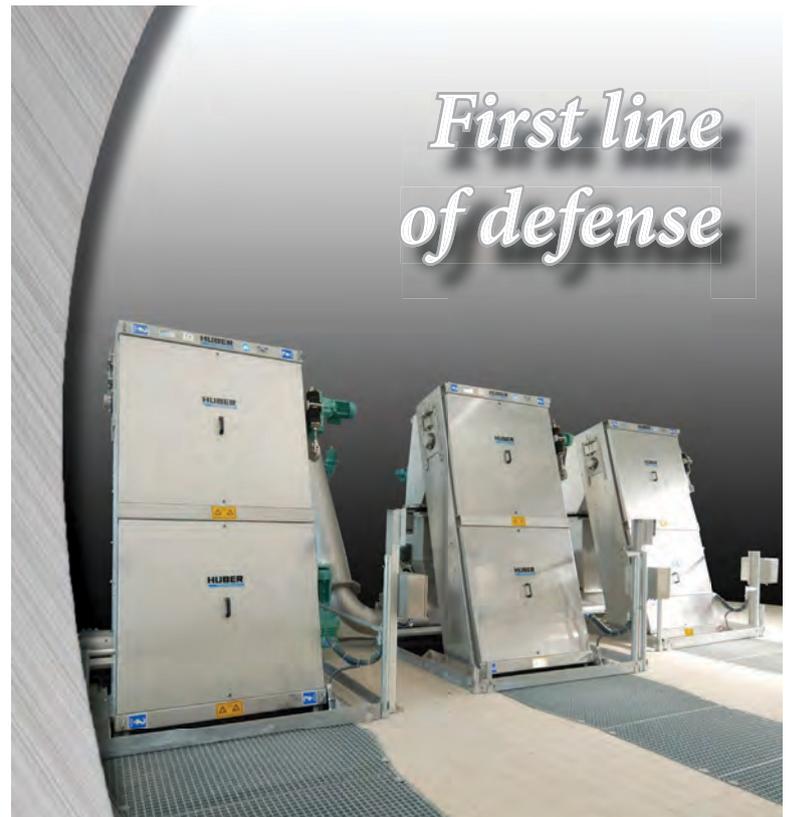
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NAME GAME

The Making of a Biosolids Moniker

How do you get the public excited about biosolids? In Mechanicsburg, Pa., a naming contest asked residents to put on their thinking caps and drum up a catchy name for Class A biosolids. Find out how this public relations effort earned support from the community, and then read more about why the borough made the switch from Class B to Class A biosolids.

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OVERHEARD ONLINE

“Until 1974, uniform standards for tap water did not exist. Sure, many cities and municipalities had good water ... but the Safe Drinking Water Act created standards for contaminants that were enforceable.”

Here's to 40 Years of Safe Drinking Water
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TEST PREP

5 Tips for Acing Math

Do you go weak in the knees when encountering a math question? Rid yourself of those mental blocks with these five tips for mastering wastewater math exam questions. With just a few test-taking strategies — from reading questions thoroughly to using diagrams — you'll find yourself confident enough to master any operator exam.

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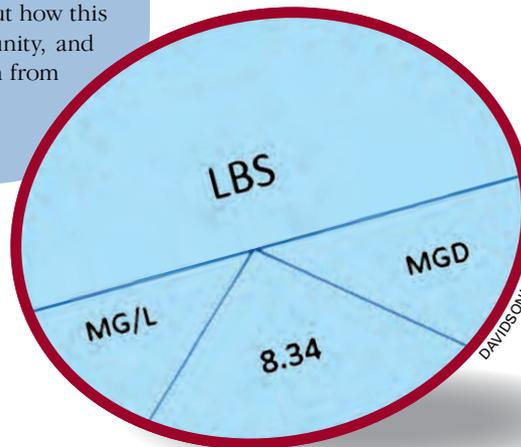


WEATHER ODDITY

What the Heck is Frazil Ice?

This cold-weather phenomenon requires a particular set of variables: a clear night, a slight offshore wind and plunging temperatures. Learn why it can mean frazzled nerves for managers of surface water systems and disaster for water system intakes. You'll also find out how some municipalities — especially those along the Great Lakes — have learned to deal with the challenge.

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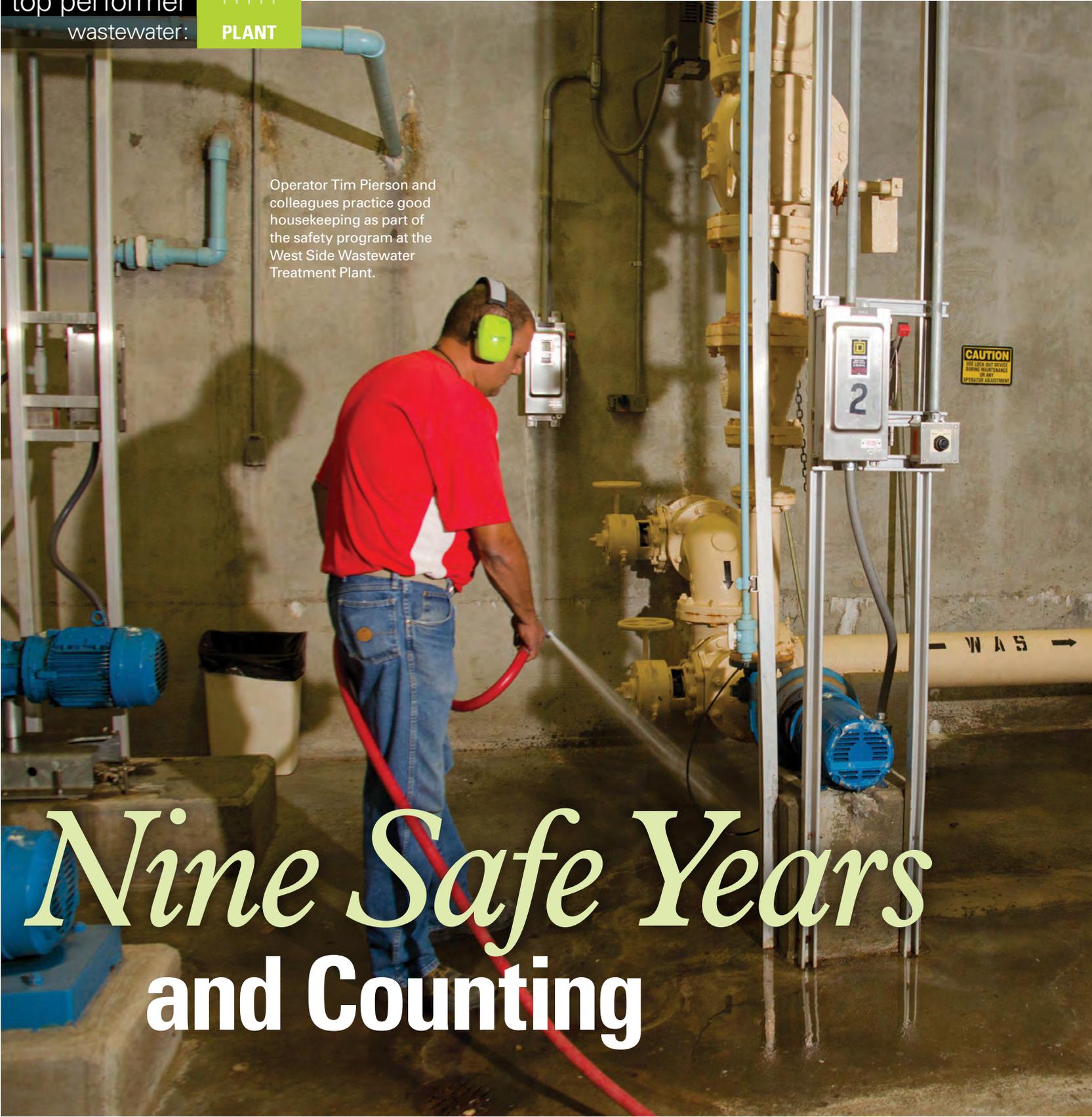
Plunger Pump

- sludge transfer
- positive displacement
- high suction lift



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Operator Tim Pierson and colleagues practice good housekeeping as part of the safety program at the West Side Wastewater Treatment Plant.



Nine Safe Years and Counting

A KENTUCKY PLANT ACHIEVES AN INCREDIBLE RUN WITHOUT A LOST-TIME ACCIDENT AND WINS GOVERNOR'S SAFETY AWARD, WHILE ALSO BOOSTING EFFICIENCY AND IMPROVING OPERATIONS

STORY: **Trude Witham**
PHOTOGRAPHY: **Amber Jones**



“As their administrator, I try to lead by example. They see me with my eye protection on when I’m near a pump. They see that I’ve put that on because something in the pump can come loose. Ultimately, we all want to go home safe and sound.”

ALAN TODD

OPERATORS AT THE WEST SIDE WASTEWATER

Treatment Plant have always put safety first, from the time the plant started up in 1996. It began with training and monthly safety meetings.

“We would discuss the safety procedures we had put in place to cover everything from chemical storage and general housekeeping to emergency response for tornadoes and earthquakes,” says Alan Todd, superintendent at the plant in Madisonville, Ky.

Christy Brooks, safety manager, conducts training on topics such as staying safe when working around chemicals. The team also takes hazardous materials communication training given by the city’s risk manager. Topics include safety data sheets and chemical labeling and handling.

The safety program has paid off. In 2014 the plant won its ninth consecutive Governor’s Safety and Health Award from the Kentucky Labor Cabinet. To qualify, a plant must work more than 250,000 hours without a lost-time accident or occupational illness. The West Side plant was at more than 477,000 hours as of last September.

The plant has also made significant changes to save energy and improve operations. Effluent contains less than 3 mg/L BOD, less than 4 mg/L TSS and less than 0.89 mg/L ammonia.

MANUFACTURING HUB

Madisonville, in Kentucky’s western coal fields region, is a manufacturing hub. GE Aviation, Ahlstrom and other companies have plants there and have revitalized the post-coal economy.

“About 33 percent of our customers are industrial,” says Todd. “There’s a meat packing plant, another one that makes paper filters, and there’s a hospital and a commercial laundry. We started an industrial pretreatment program in 1991 and we work with these customers to make sure their effluent meets regulations.”

The plant received a 2014 Control Authority Pretreatment Excellence Award from the Kentucky/Tennessee Water Environment Association.

Designed for 6 mgd, the plant uses an oxidation ditch process to treat an average of 4.8 mgd for 20,000 people in Madisonville, Hanson and Earlington. Equipment includes two fine screens (Lakeside Equipment Corporation), two 110-foot-diameter clarifiers (Walker Process Equipment), and two gravity thickeners (Evoqua Water Technologies, LLC). The original 1996

West Side Wastewater Treatment Plant, Madisonville, Ky.

BUILT: | 1995-1996

POPULATION SERVED: | 20,000

EMPLOYEES: | 11

FLOWS: | 6 mgd (design), 4.8 mgd (average)

TREATMENT LEVEL: | Secondary

TREATMENT PROCESS: | Activated sludge (oxidation ditch)

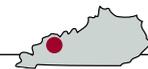
RECEIVING WATER: | Greasy Creek

BIOSOLIDS: | Landfilled

ANNUAL BUDGET: | \$1.4 million

WEBSITE: | www.madisonvillegov.com

GPS COORDINATES: | Latitude: 37°19'12.19" N; longitude: 87°33'16.77" W





The staff at the West Side Wastewater Treatment Plant includes: left side, from bottom up, Christy Brooks, Janet Sivells, Bennie Holmes, Carl Hancock and Jackie Cottrell; right side, Alan Todd, Tim Robards, George Durham, Tim Pierson, Dean Durham and Anthony King.

UV disinfection system was replaced with a TrojanUV3000Plus in 2013. Biosolids are hauled by Clay's Trucking and landfilled.

The plant recently upgraded the SCADA system (Trihedral Engineering Limited) and conducted training in-house. "I gave everyone an iPad and showed them how to log into the computer," says Todd. "It has worked out well. We held a one-day training with the UV manufacturer. The new system is more automatic and will turn itself off when not needed. We're saving \$1,000 to \$1,500 a month in energy costs."

The plant has also saved by installing variable-frequency drives on the oxidation ditches. "We run only one of the two ditches and at a lower speed," says Todd.

DOING IT ALL

The plant's eight full-time operators do everything from operations and maintenance to grounds work and industrial pretreatment. That includes preventive maintenance, oil changes, equipment repairs and cleaning and painting. "We have a lab technician who does all the lab work, although the operators run dissolved oxygen and pH tests in the field,"

EAGER TO LEARN

A team of 11, including eight operators, keeps the West Side Wastewater Treatment Plant running so well the plant has won four operations awards:

- Operations and Maintenance Excellence Award, U.S. EPA, Region 4, 2001
- Outstanding Operations, Kentucky Water & Wastewater Operators Association, 2001 and 2012
- Operational Excellence Award, Kentucky-Tennessee Water Environment Association, 1997-2003 and 2012-2013
- Wastewater Plant Award, Kentucky Water & Wastewater Operators Association, Western Chapter, 2001

Says Alan Todd, plant superintendent, "They care about what they do, they do their jobs well and they work wonderfully together. They also like to learn, which is key." Todd holds Class IV wastewater

treatment certification and has been with the city for 20 years. Reporting to him are:

- Christy Brooks, administrative secretary, Level II voluntary pretreatment certification, 13 years
- Tim Robards, chief operator, Class IV, 29 years
- Jackie Cottrell, 29 years; Dean Durham, 12 years; George Durham, 10 years; and Tim Pierson, 21 years, Class III operators
- Anthony King, Class II operator, four years
- Janet Sivells, laboratory technician, Class I wastewater analyst, 16 years
- Carl Hancock, belt press operator, six years
- Bennie Holmes, crew worker, 38 years

“They realize the importance of returning hand tools, power tools and electrical cords, for example, to the proper storage area to help eliminate trip and fall hazards.

All fuel containers are kept in locked fuel storage cabinets.”

ALAN TODD

says Todd. “There is also a lab in Madisonville where we can take samples when the plant’s lab technician is out during a holiday, vacation or sick leave.”

Operators work either 6 a.m. to 2 p.m. or 2 to 10 p.m. Four operators work the day shift and two work the second shift. “First thing in the morning they check on the equipment, and then they meet with me to see what maintenance needs to be done,” says Tim Robards, chief operator.

Operators take part in job fairs to promote the industry and lead plant tours for school and college groups. They also attend outside training classes and seminars to obtain the 24 CEUs they need every two years to retain their certification.

STAYING SAFE

The West Side team members are proud of the plant’s safety record and work hard to keep it. “We have different chemicals on site,” says Todd. “One is a coagulant, and we also use phosphoric acid for cleaning. So we need to make sure we store and handle these properly.”

The operators also pay close attention to preventing trips and falls and to general housekeeping. “They realize the importance of returning hand tools, power tools and electrical cords, for example, to the proper storage area to help eliminate trip and fall hazards,” Todd says. “All fuel containers are kept in locked fuel storage cabinets.”

The team members also take part in in-house training and constantly review new printed safety materials and videos. Last year’s safety meeting schedule included topics such as eye protection, hearing

protection, respirators, lockout/tagout, machine guarding, electrical safety, fire extinguisher training and safe lifting. To help prevent occupational illnesses, the plant staff conducts training on bloodborne pathogens, hazardous communications, confined-space entry and personal protective equipment.

The plant’s emergency action plan, reviewed and updated every year, covers medical emergencies, fires, severe weather, natural disasters, bomb threats, chemical spills and extended power loss. The team conducts training on how to respond to an earthquake. The plant is in the New Madrid



Tim Robards performs a maintenance check on one of the treatment plant’s pumps.

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Superintendent Alan Todd and his team have won numerous awards over the years.

West Side Wastewater Treatment Plant PERMIT AND PERFORMANCE

	PERMIT (monthly avg.)	EFFLUENT (2013 avg.)
BOD	10 mg/L	<3 mg/L
TSS	30 mg/L	<4 mg/L
Ammonia	May-Oct: 2 mg/L Nov-Apr: 5 mg/L	<0.89 mg/L
Fecal coliform	130/100 mL	12/100 mL

Seismic Zone, which the U.S. Geological Survey considers the most active zone east of the Rocky Mountains. “Although the plant has never experienced an earthquake, we take this seriously and cover it in the annual review of our emergency action plan,” says Todd.

Diligent training is key to the plant’s continued success. “It is difficult to even be eligible for the Governor’s Safety and Health Award, and once you are you want to continue to achieve this year after year,” says Todd. “If you even have one accident, you have to start the eligibility process all over again.”

The plant’s award certificate, mounted on a wooden plaque, is signed by Gov. Steven Beshear, Secretary of State Larry Roberts and Department of Workplace Standards commissioner Anthony Russell. The awards are part of the governor’s efforts to improve the health of all Kentuckians. Todd received the plaque at the June 2014 Governor’s Safety and Health Conference in Louisville, Ky.

COPING WITH STORMS

Plant operators and staff have been challenged by inflow and infiltration and by power outages. During heavy rains the plant has seen up to 20 mgd. “We use a coagulant during high flows,” says Todd. “It allows us to improve solids settling. We keep the chemical on hand and feed as needed.”

The plant discharges to wetlands that flow into Greasy Creek. A severe ice storm in January 2009 created widespread power outages and damaged trees and houses. Many residents were without power for weeks, and Madisonville was placed under a curfew for citizens’ safety.

“We got 3/4 of an inch of ice and were without power at the treatment plant for 14 days,” recalls Todd. “The generators were running, but we had a problem getting fuel since we couldn’t get anyone to deliver with all the trees down.” Plant staff members finally reached a distributor in town, placed a 500-gallon tank on a trailer and drove 3.6 miles to get fuel.

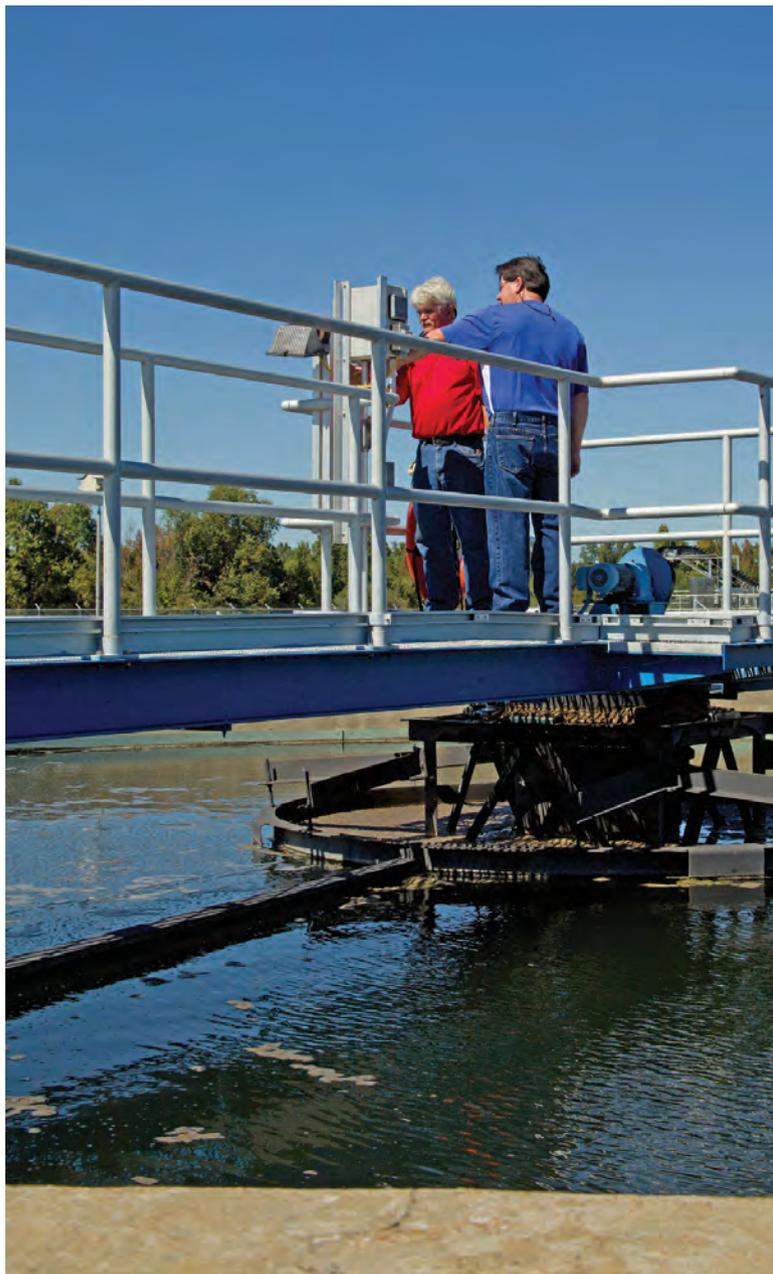
“We went through a lot of fuel to keep the process running, but the generators weren’t large enough to run the oxidation ditch,” says Todd. “For six or seven days we didn’t add any oxygen to the wastewater, but we finally located and operated a portable generator so we could run the aerator. We were still able to discharge.”

FUTURE PLANS

A plant upgrade in January 2015 replaced an aging belt press for biosolids dewatering with a rotary fan press (Prime Solution). “In the belt press, the sludge goes through a series of pressure points, chemical addition and then dewatering,” says Todd. “With the new press, sludge is pumped into a 48-inch rotary fan moving at 1 rpm or less.”

Like the old press, the new one can handle 80 gpm, but it is much more efficient. “We used to get 16 percent solids,” says Todd. “The new one delivers 22 percent on average and can be as high as 26 percent. It will pay for itself in reduced landfill costs.”

The team also plans to install energy-efficient lighting throughout the facility in 2015. In the meantime, the team aims to continue its safety record.



Anthony King (left) and Dean Durham check the status of a clarifier.

“They need to trust in themselves, and if they put themselves first and follow procedures the rest will take care of itself,” Todd says.

“As their administrator, I try to lead by example. They see me with my eye protection on when I’m near a pump. They see that I’ve put that on because something in the pump can come loose. Ultimately, we all want to go home safe and sound.” tpo

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The Most Credible Voices

PHOTOS COURTESY OF THE VIRGINIA BIOSOLIDS COUNCIL



Virginia Biosolids Council members, state officials and farmer members of the Small Grains Board observe the first phase of Virginia Tech's research on small grains and biosolids.

THE VIRGINIA BIOSOLIDS COUNCIL FINDS THAT FARMERS ARE THE MOST EFFECTIVE SOURCES FOR CONVEYING INFORMATION ABOUT LAND APPLICATION TO OFTEN SKEPTICAL CITIZENS

By Craig Mandli

Everyone has played the game, “Telephone,” where players pass a message from person to person and see how it’s distorted by the end.

The Virginia Biosolids Council wants to avoid such distortions and make sure its message — that the land application of biosolids is safe and beneficial — gets through loud and clear.

The council is aiming its latest efforts at farmers. Biosolids are applied to about 55,000 acres in Virginia, less than 0.7 percent of the state’s 8.25 million acres of farmland. The council wants to get more farmers on board. It also wants to bring those already using or considering biosolids up to speed on the science behind it and the benefits it brings to farmers and municipalities.

“The neighbors and those on the fence need to become familiar with the science and facts before the opposition gets to them. If we can’t get that information to them first, we have a lot of catching up to do.”

CHARLES HOOKS

“We’ve conducted all sorts of educational outreach since we began this organization in 2005,” says Charles Hooks, the council’s secretary. “We started with a website and sent out regular newsletters. We’ve worked with the local university extension to hold public education classes. What seems to hold the most weight with people, though, is when they hear about it from the farmers themselves.”

QUELLING CONTROVERSY

Hooks sees no shortage of items on the Web arguing that land application can have negative effects. He believes that stems from the “ick” factor — uninformed people linking biosolids with “human waste.”

“It’s certainly the nature of the Internet to collect information that reinforces a pre-existing prejudice,” says Hooks. “It turns into a ‘Whoever screams the loudest wins’ mentality. We know there are

those we’ll never be able to convince. It’s just important to us that our information is out there, too.”

Hooks points to an “overwhelming body of scientific research that supports the conclusion that recycling biosolids on farm fields and forests and composting for residential and commercial applications is safe.”

In 2007 the Virginia Department of Health published a study, “Health Effects of Biosolids Applied to Land: Available Scientific Evidence,” as a detailed review of scientific literature about biosolids and human health. It concluded that, “There does not seem to be strong evidence of serious health risks when biosolids are managed and monitored appropriately.”

It also asserts that allegations about biosolids usually lack medical evidence of human health effects and “do not meet the biological plausibility test.”

Hooks observes, “Our role in that study was to serve the panel and gather scientific information

to be used in making the final determination. Of course, the detractors were given the same opportunity. Our council presented the panel with a great volume of research while the opposing side really had none.”

CALMING EFFECT

In part based on that research, the Virginia General Assembly enacted numerous laws to regulate the production and beneficial use of biosolids, based on the U.S. EPA Part 503 Biosolids Rule. The EPA has approved Virginia’s biosolids management program, and the state Department of Environmental Quality regulates land application.

“The research has certainly served to calm the opposition,” says Hooks. “It has also enabled our group to be more proactive.” In 2010 the council partnered with the Water Environmental Research Foun-



The Virginia Biosolids Council exhibits at conventions and other gatherings to spread its message.

dation to study the knowledge of biosolids among people living near application sites.

Twenty-four families were interviewed. Most had little or no concern but also little knowledge of the material being spread on neighboring fields. For Hooks and the council, that meant it was time to urge farmers to spread the message to their neighbors.

“We determined that the three factors most people are concerned about are odor, health effects and the environmental impact,” says Hooks. “Those concerns are easily rectified with research and education.”

FARMERS SPEAK OUT

The council mobilized farmers to speak on behalf of biosolids at a series of public meetings before approval of the Virginia biosolids regulations. Council members also adopted a Code of Good Practice that provides all farmers with a template for going beyond the regulations to make sure land application practices minimize social impacts.

The council has also organized trips for farmers to Virginia Tech University to learn about the school’s research on the effect of biosolids on small-grain farming. “When you get down to it, farmers are a respected and beloved group,” says Hooks. “However, as a practical matter, there aren’t a lot of farmers left, so the amount of political clout they have by themselves is weakening. But if we can get farmers to educate their families, friends and neighbors, those numbers improve.”

CHANGING ATTITUDES

In the 10 years since the council’s inception, Hooks has seen a shift in attitudes toward biosolids. The opposition is still there, but getting more farmers on board with education has paid dividends. The goal now is simply to educate more people.

To continue spreading the word, the council regularly updates its website with new research results. Its newsletter reaches 1,500 subscribers including farmers, neighbors, media and state officials. Regular features tell about Virginia farmers who use biosolids. The council also sets up a booth at the Virginia Association of Counties’ annual convention and an exhibit at the state fair.

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“We’ve found that most people either support the beneficial use of biosolids or are open to more information,” says Hooks. “The neighbors and those on the fence need to become familiar with the science and facts before the opposition gets to them. If we can’t get that information to them first, we have a lot of catching up to do. That’s why having those farmers in our corner is so important.” **tpo**

The Virginia Biosolids Council arranged a field trip for members of the Biosolids Expert Panel to a land application site and the Henrico County Water Reclamation Facility. James Grandstaff (center, in sunglasses), the facility’s division director, led the tour.



PUSHING THE ENVELOPE

SID FREDRICKSON'S AWARD-WINNING CAREER IN COEUR D'ALENE HAS BEEN A CONTINUOUS QUEST FOR MORE EFFICIENT AND EFFECTIVE TECHNOLOGY AND TREATMENT

STORY: **Ted J. Rulseh**
PHOTOGRAPHY: **Sheena Dunn**

DURING SID FREDRICKSON'S FIRST YEAR AS COEUR D'ALENE WASTEWATER superintendent, part of the answer to a challenging phosphorus limit was a process chemical mixing tank stirred by an electric fishing motor.

Twenty-three years later, the plant's phosphorus control technology is, to say the least, a bit more sophisticated. What hasn't changed is the dedication Fredrickson and his team bring to quality performance in the city's treatment plant and collections system.

They're keeping a 75-year tradition of excellence: Coeur d'Alene's plant, commissioned in 1939, was among the first in the nation to provide secondary treatment. Today the team in Coeur d'Alene, a city of 46,000 in Idaho's panhandle, is gearing up to meet a new and extremely stringent effluent phosphorus limit.

Fredrickson, nearing retirement, plans to stay on board at least long enough to get the plant's full-scale pilot membrane microfiltration tertiary treatment system commissioned and optimized. Whenever he chooses to step down, it won't be without recognition: The Pacific Northwest Clean Water Association presented him with its 2013 William D. Hatfield Award.



Sid Fredrickson, wastewater superintendent, City of Coeur d'Alene, Idaho.

bachelor's degree in secondary education there (1970) at what is now the University of Montana — Western. He taught chemistry, physics and math in Montana public schools for three years, then spent 10 years with a Montana consulting engineering firm, in the process serving as a resident inspector on a complete rebuild of the treatment plant in Kalispell.

After 2 1/2 years as public works director and city engineer for Whitefish, Mont., he moved to Coeur d'Alene as streets superintendent, also in charge of the stormwater system. He became wastewater superintendent in May 1991.

"I had done a lot of plant startups and operator training while with the engineering firm," Fredrickson says. "I'd been involved in water quality with Coeur d'Alene because we had a lot of issues with stormwater. So it wasn't as if I was moving very far away from the tree.

"At the time someone asked me, 'Why would you want to make that move?' I said, 'Why would I want to get away from the general fund and having to fight for tax dollars, and move to an enterprise fund where I've got the money to do what needs to be done? Gee, I can't imagine why I would do that.'"

PROCESS INNOVATION

Coeur d'Alene's treatment plant has a nominal 6 mgd design flow but is derated to 4.2 mgd with nitrification for ammonia removal. The dry-weather flows average 3.8 mgd. Secondary treatment consists of trickling filters followed by a solids contact process.

"The detention time in trickling filters, particularly those like ours that use plastic media, is very short, only about 10 minutes," says Fredrickson. "So to augment that we have sludge re-aeration basins that end up feeding a

TEACHER BY TRAINING

Fredrickson tells people he comes "from the Mountain West." If that's not highly specific, it's because his father was an air traffic controller stationed in places from Wyoming to Alaska. "I was born in the little town of Richmond in northern Utah, but we made 13 major moves in my first 12 years," says Fredrickson.

He graduated from high school in Dillon, Mont., and also earned his

“ You need to have a good sense of humor. I don't know how you get along in this world without it.”

SID FREDRICKSON

Fredrickson's background includes teaching in high school and working for a consulting engineering firm in Montana.

Sid Fredrickson, City of Coeur d'Alene, Idaho



POSITION: | **Wastewater superintendent**

EXPERIENCE: | **41 years (at Coeur d'Alene since 1986)**

CERTIFICATIONS: | **Class IV wastewater treatment,
Class IV wastewater collections**

EDUCATION: | **Bachelor of science, secondary education,
chemical and physical science major, math minor,
Western Montana College**

MEMBERSHIPS: | **WEF, Pacific Northwest Clean Water Association**

GOALS: | **Oversee construction and optimization of tertiary
microfiltration membrane system**

GPS COORDINATES: | **Latitude: 47°40'56.20" N; longitude: 116°47'43.32" W**





Sid Fredrickson works with an auto-analyzer for phosphorus and nitrogen. Nutrient removal is essential to the Coeur d'Alene plant's process.

CONTROLLING THE FLOW

Coeur d'Alene's wastewater team is heavily invested in the collections system, which includes about 210 miles of pipe, 4,400 manholes and 10 lift stations. A master plan in 2013 gave the system's overall condition a B-minus. "That's not bad, considering that the first lines were vitrified clay tile laid in 1907 and that we have a lot of unreinforced concrete pipe," says Sid Fredrickson, wastewater superintendent.

"For the past dozen years we've been very aggressive in rehabilitation, particularly for the old areas of the city. We've been doing cured-in-place pipe lining for lines 8 inches and up. The 6-inch pipes we generally don't line because we replace those with 8-inch.

"We've been trying to comply with General Accounting Standards Board 34, which says that without aggressive rehab and replacement you should fund depreciation at 100 percent. That would be cost-prohibitive. We believe we can extend our system's life by 75 years by spending about \$700,000 a year on rehab and replacement, so that's what we're doing."

The collections team includes Larry Parsons, supervisor; Glenn Shute, field inspector; and Tom Steele, Scott Schremp, Darrell Castleberry, Brad Callihan and Rob Grytness, operators.

solids contact tank. We blend reaerated secondary sludge with the trickling filter effluent. That becomes the solids contact process.

"We're giving the rejuvenated microorganisms enough time to be in contact with the trickling filter effluent to further reduce the BOD, particularly the dissolved BOD. We pull activated sludge off the bottoms of the secondary clarifiers and can send it in two directions. We can waste it to our digesters, or we can recirculate it through the sludge reaeration basins.

"If the total plant flow is Q, we have about 0.3Q going through solids reaeration. The process was developed by Brown and Caldwell. It has its advantages. There aren't many operational difficulties with it. It handles shock loads very well." Final effluent is disinfected with chlorine, dechlori-

he says. "Starting in June 1991 we had to achieve 85 percent reduction, and we didn't have anything in place to do that. So it was a scramble.

"We rented a 2,000-gallon tank, purchased some small peristaltic feed pumps and started buying alum and adding that to our secondary clarifier splitter box. We added liquid polymer to help the flocculation process, and that also helped with phosphorus removal. We mixed the tank contents with a Minn Kota electric outboard motor. We were having alum deliveries almost every other day.

"We still do alum addition, but now we split our flow of alum. Roughly half of it goes to the head of our preaeration grit removal basin. The other half goes to our secondary clarifier influent splitter box. The reason we split the flow is that by going ahead of the primaries we decrease the loading on our trickling filters and increase nitrification.

“We now have a nine-year compliance schedule to achieve a seasonal average of less than 50 µg/L phosphorus. That's why we're building our tertiary unit.”

SID FREDRICKSON

"We also have added integrated fixed film activated sludge units. It's a cloth media system installed in our solids contact basins and it provides a home for the nitrifying bacteria. So we're increasing our nitrification with those units. We do have an ammonia limit in our permit at 10 mg/L based on our current flows.

"Our phosphorus limit had been 1.0 mg/L or 85 percent removal, whichever is less. That changed with the issuance of our new permit last November. We now have a nine-year compliance schedule to achieve a seasonal average of less than 50 µg/L phosphorus. That's why we're building our tertiary unit."

nated with sulfur dioxide and discharged to the Spokane River.

Wasted solids are anaerobically digested, dewatered to 25 to 26 percent solids in a high-speed centrifuge (Alfa Laval Ashbrook Simon-Hartley) and transported to an aerobic static pile composting facility about 2 1/2 miles away. The compost is sold wholesale to nurseries and landscapers. "It's an environmentally friendly way of handling biosolids without taking up valuable landfill space," Fredrickson says.

IMMEDIATE CHALLENGES

The treatment process took hold of Fredrickson's attention from his first days as superintendent. "My first year was also the first year we had to initiate phosphorus removal,"

TARGETING PHOSPHORUS

The Coeur d'Alene team pilot-tested three 50,000 gpd advanced tertiary filtration units over about 18 months: an upflow sand filter, a membrane bioreactor and a ZeeWeed membrane microfiltration system (GE Water & Process Technologies), which they ultimately chose for a full-scale test.

"We found that with the tertiary membrane filter, if we put a return activated sludge line between the membrane tank and the chemical mix tank, we actually make a mixed liquor and achieve nitrification as well as phosphorus removal," says Fredrickson.

"The membranes get scour air 100 percent of the time, so by looping the sludge, basically drawing off the mixed liquor from the membrane tank and returning it to the large chemical mix tank, we create an activated sludge ahead of the membranes that provides nitrification. Then, by adding alum to the chemical mix tank, we also precipitate the phosphorus, and of course we're removing that in the membranes as well.

"With our engineers [HDR], we are cautiously optimistic that this system will scale up. It's one reason we're sizing the membrane filter basins so they will be easily expandable to 5 mgd. We're installing only 1 mgd of membranes at this stage just to make sure that we prove our ability both to remove phosphorus and to nitrify."

OUT WITH ODORS

The team faced a couple of more immediate challenges with odor control and compost facility efficiency. In the late 1990s after odor complaints started, team members interviewed residents of a nearby neighborhood and learned that, "We were about two weeks out from getting sued," Fredrickson recalls.

After a study identified the biggest odor sources, the team took action. Measures included collecting foul air from the sludge thickeners, belt filter presses and centrifuge and routing it through the two trickling filters (half through each) followed by compost-bed biofilters.

The 14-acre biosolids compost facility, built in the late 1980s, was among the first in the Northwest. "Back then the experts didn't know much more than we did about building a compost facility in the type of climate we have," Fredrickson says.

"We did a major revamp of the process for mixing the wood chips and biosolids. We put in a gyratory screen to make three fractions of compost: 3/4 inch and larger to go to the recycle pile, less than a 1/4 inch to become finished compost, and material in between to be run through a hammermill and ground up. That would produce an additional 1,000 cubic yards of compost per year.

"It seemed like a good idea, but Mr. Fredrickson didn't check how much power the hammermill would consume. Long story short, we generated an extra \$10,000 a year in revenue but it cost us \$11,000 in power. We don't do that anymore. Now we have a single trommel screen with a 1/4-inch opening so that material either goes to finished compost or goes to the reclaimed chip pile. That works much better."

The static compost piles are enclosed and foul air is fed through a compost biofilter. The site is staffed by Paul Mitchell, lead worker, and Clark Thomas, operator.

MANAGEMENT STYLES

To keep processes and the team working smoothly,

Fredrickson combines two approaches to management. Managing by exception means spotting "out-of-spec" processes or behaviors and taking quick corrective action. Management by walking around means being visible, available and approachable: "If you see something that looks good, compliment the people on it. If you see something that looks bad, deal with that in private."

The team's longevity attests that those approaches work: The wastewater department staff represents a collective 326 years with the city and 520 years in the trade, an average of nearly 21 years per employee.

Plant team members include Don Keil, assistant superintendent; Jim Remitz, capital program manager; Mike Becker, utility project manager; Torri Green, administrative support; Casey Fisher, chief wastewater operator; Mark Moore, Ben Martin, Marc Branscome, Andy Williams and Mike Taylor, operators; Mike Zwiebel and Aaron Camp, maintenance mechanics;

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From left, Don Keil, assistant superintendent; Torri Green, administrative support; and Sid Fredrickson. They're shown with a piece of work from a guest artist: a sculpture of a male dung beetle.

John Dearth, lab/pre-treatment supervisor; and Dave Hauser and Susan Whittier, lab analysts.

Adding to the team is one of Fredrickson's current challenges. "We're looking to hire additional people in the plant because as we put these complex processes online, it will take more effort to make sure everything is running right," he says.

"I can't go out on the market and say, 'I want an experienced Class III or Class IV operator who knows all about membranes and meeting 50 parts per billion phosphorus.' They don't exist." Instead, he looks for sharp people with some wastewater background who want to learn, don't have outsized egos, get along well with others, are hard-working and dependable, and ideally have a special skill, like pipefitting or instrumentation. "That's where we're going to get our people. That's how we're going to increase our ability to do those complex tasks."

ADVICE TO PEERS

Some three decades in municipal and utility service have taught Fredrickson good lessons that he's glad to share with colleagues. "When dealing with local politics — and municipal treatment plants always do — it helps to forge good relationships with the elected governing body.

"You have to build trust. They need to trust that you are doing the right things, otherwise you won't get what you need to do the job. You also have to understand that there are more than two colors when you're dealing with a governing body. Everything is not black or white. You have to learn to compromise, without compromising your own integrity and honesty."

And finally: "You need to have a good sense of humor. I don't know how you get along in this world without it." *tpo*

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LEFT: Jim Jans (left), manager of the Corbett Water District, with David Jacob, owner of Hydra Engineering and designer of the district's hydro-turbine. BELOW: A jet on either side of the hydroturbine feeds water from an 8-inch supply pipe. The electrical box with disconnect lever is above the unit.



PHOTOS COURTESY OF AMARETT-JANS

Gains by Gravity

A SMALL OREGON WATER TREATMENT PLANT BREAKS NEW GROUND WITH A CUSTOM-BUILT HYDROTURBINE THAT SAVES ON ELECTRICITY COSTS

By **Scottie Dayton**

Operating costs at the Corbett (Ore.) Water District water treatment plant were steadily increasing, and rates rose accordingly.

Jim Jans, district manager, saw irrigation systems and some larger wastewater treatment plants using hydroturbines and wondered why his district couldn't use a smaller version of the technology to help reduce the cost of water distribution. "I learned that the Federal Energy Regulatory Commission prohibited the installation of hydrogenerators on municipal drinking water mains," he says. "I refused to accept that reasoning."

Numerous obstacles and extensive paperwork took eight years to resolve, but the commission finally granted approval in 2013. David Jacob, owner of Hydra Engineering in Welches, Ore., designed the 24-inch-high, 15 hp hydro-turbine based on the plant's total dynamic head and hydraulic flow. Since it went online in February 2014, the district hasn't paid an electric bill.

SIZE IS EVERYTHING

The 1.4 mgd (design) plant delivers 500,000 gpd in winter and 1.2 mgd in summer to a population of 1,080. Water from an intake on Gordon Creek flows 2 miles down a 10-inch pipe at 180 feet of head, delivering 900 gpm to the plant. A CLA-VAL valve reduces the 90 psi pressure as water flows to a weir that distributes it to three sand-and-gravel filter ponds. After chlorine addition, finished water is piped into a million-gallon storage tank for distribution.

"Our small size was David's biggest stumbling block in designing the turbine," says Jans. "He couldn't recommend anything off the shelf as it could have too high an rpm or oversized piping." A New York company built the turbine.

While waiting for its arrival, Jans wanted to build a 4- by 8-foot building for the hydro components. "City hall didn't know how much a building permit for a hydroelectric plant would cost," he says. "The district electrician charges \$92 to inspect a 20-amp circuit, which we would install, and that became the cost of our permit."

Jans ordered a waterproof fiberglass building from Power Design in Odell, Ore., saving \$10,800 by not hiring a contractor to build a wooden structure. Then he and utility operators Jeff Busto and Hans Rathjean framed and poured a 4-foot-square concrete pad for the building 8 feet from the weir.

POWER PREPARATIONS

They dug a 320-foot-long trench from the treatment plant to the pad and laid three electrical conduits. "One powers the lights, fan and heater in the hydro building," says Jans. "Another carries the power we generate to Portland General Electric Power's two-way net meter, and the third is for when we build another turbine."

Plumbing included an 8-inch pipe from the weir to the pad, a fish screen designed by Farmers Conservation Alliance on the Gordon Creek intake and a Y-strainer at the pressure-reducing valve. Both screens have 3/32-inch holes to keep out fish and gravel. "Emulsifying fish in the turbine was a major concern for our local Department of Environmental Quality representative," says Jans.

The team also installed two tees with motorized butterfly valves to chan-

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Jim Jans checks the daily kilowatt-hour production.

nel water to the turbine or filter ponds. Two electronic gate valves split the incoming flow to a jet on either side of the turbine. After water hits the fins and spins the motor, it drops out of the bottom to a diverter box below the pad for dispersal to the ponds. The plant's RSView32 SCADA program (Rockwell Automation) controls the system.

The pressure-reducing valve used a lot of energy. With the new arrangement, it is on only when the turbine is off. "Our monthly electric bill was \$400," says Jans. "Since we activated the turbine in February 2014 we haven't had one."

OTHER COMPONENTS

The 250-volt DC generator, running at 1,500 rpm, generates 10 kW at 15 amps. Two inverters operating in master-slave mode convert DC current to

“Our monthly electric bill was \$400. Since we activated the turbine in February 2014 we haven't had one.”

JIM JANS

AC current compatible with the power grid. In the event of a utility power failure, the outage triggers an alarm and switches the inverters to send power to large heat sinks.

"Telemetry notifies us and we switch off the turbine until PGE restores power," says Jans. "If we transmitted power while PGE was down, we could electrocute a lineman."

The turbine averages 50 kWh per day more than the plant's usual requirement of 100 kWh. "In seven months, I've put 3,000 kWh in the bank through PGE's net metering program," says Jans. "At the end of our yearly cycle, the utility keeps it to help low-income families afford electricity." The \$4,800 the district saves annually by not paying electric bills helps offset the cost of upgrading the distribution system.

MADE IN THE USA

When the turbine arrived, Jans noticed many foreign parts. A quick search on the Internet revealed no U.S. substitutions. "The 3- by 3-inch inverter boxes weren't very robust," he says. "We pulled them out and had Canyon Hydro in Deming, Wash., rebuild and modernize them to avoid trouble down the road."

Replacement of the capacitors and relay switches came next. In January 2015, Jans shut off the turbine, enabling Canyon Hydro to replace the remaining foreign components. "I want an all American-made turbine," he says. "My next goal is for Canyon to manufacture spare parts for everything, including the electric motor, then put them on my shelf." **tpo**

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From the *Bottom Up*

COMMUNITY RESIDENTS' INPUT HELPS A SASKATCHEWAN UTILITY DESIGN AN INNOVATIVE WATER TREATMENT SYSTEM WITH SENSITIVITY TO COST AND LOCAL NEEDS

STORY: **Trude Witham**

PHOTOGRAPHY: **Devin Wilger**

“ We sent out the survey, held an open house and invited the public. The information we gathered helped us build the framework for the waterworks system.”

MICHAEL BUCHHOLZER

THE CITY OF YORKTON'S SLOGAN IS "WHERE GOOD things happen." Many happen at the new Queen Street Water Treatment Plant. Commissioned in 2012 and situated on Logan Green, the plant is part of a green water management system that incorporates the latest treatment technologies and green methods of handling filter backwash water.

In 2004, when leaders of this Saskatchewan city of 20,000 began working on a plan to upgrade aging water treatment plants, they started with customers. A survey asked residents what water-quality improvements they wanted and how much they were willing to pay.

Involving customers was a key to success. "We made the community aware that we wanted to build this new plant and we needed their input," says Michael Buchholzer, director of environmental services. "We sent out the survey, held an open house and invited the public. The information we gathered helped us build the framework for the waterworks system."

The system is a unique solution for this environmentally sensitive area, designated as such because of the shallow aquifer below. The city saved about \$3.7 million by using settling ponds to treat the backwash water instead of diverting it to the water pollution control plant.

The system also includes wetlands for advanced treatment and wildlife habitat, stormwater management, aquifer recharge, multiuse sports fields and cycling and walking paths. The city won a 2013 Utility Excellence Award for innovative technologies from the Canadian Water & Wastewater Association, and the Logan Green Water Management System won four awards for innovation and sustainability that same year:

- Federation of Canadian Municipalities Sustainable Communities Award
- Canadian Association of Municipal Administrators Willis Award for Innovation
- Association of Professional Engineers and Geoscientists of Saskatchewan Environmental Excellence Award
- Saskatchewan Municipal Award for Excellence

AGING PLANTS

With three antiquated water treatment plants, Yorkton clearly needed a new plant. "None of the plants were connected to each other or to all 14 wells," says Glenda Holmes, waterworks manager. "We needed a new, high-output treatment facility. Our new facility is more than twice the capacity of our old system."

Buchholzer says, "The older plants weren't designed to remove manganese, so we modified the process through chemical addition to try to oxidize and capture the manganese on the pressure filters. The process was somewhat successful, but we still had numerous water-quality issues and complaints from residents about discolored water."

Water hardness was also an issue. "During our residential survey, 43 percent said they would like the city to soften the water, and 43 percent said they would not," says Buchholzer. "Only 27 percent said they would be willing to pay extra for softer water; 81 percent of those said they would only be willing to pay an extra \$5 to \$10 a month."

"We let the community know that in-home softeners would soften the water to hardness of 15-50 ppm of CaCO₃, whereas the plant would soften to 150-200 ppm of CaCO₃ for \$11 a month. Thus, in-home treatment would be more efficient and could be used or directed where required."

The city hired Associated Engineering as the consultant for Logan Green Water Management System and held a workshop to create the water system development plan. In 2006 the city began constructing a 4-million-gallon reservoir. The Logan Green project was completed in fall 2013.



Michael Josephson, operator, checks on one of the two settling ponds for backwash water in the Logan Green Water Management System.

The team at the Yorkton water treatment plant and Logan Green Water Management System includes, back row, from left, Val Fatteicher, administrative assistant; Jeff Huber and Norman Parachoniak, operators; and Michael Buchholzer, director of environmental services; middle row, Glenda Holmes and Russel Peesker, waterworks managers; and Rick Sheichuk and Scott Suschinsky, operators; front row, Karli Reeve and Karlee Wilkinson, technical assistants; and Don Teniuk and Conrad Schwartz, operators.



EXPERIENCE MEASURED IN CENTURIES

The operations team at the Queen Street Water Treatment Plant has more than 1.5 centuries of collective experience. Michael Buchholzer, director of environmental services, holds a Class 4 certification in water treatment, water distribution and wastewater treatment and collection. He has been with the city for 29 years. Val Fatteicher, administrative assistant, has been with the city for 24 years.

Waterworks managers are Glenda Holmes (Class 3 water treatment, water distribution and wastewater collection, Class 2 wastewater treatment, six years) and Russel Peesker (Class 3 water treatment, wastewater treatment, water distribution, and wastewater collection, five years). They supervise seven operators:

- Don Teniuk, Class 2 water treatment and wastewater treatment, 32 years
- Norman Parachoniak, Class 2 water treatment, water distribution and wastewater collection, Class 3 wastewater treatment, 27 years
- Conrad Schwartz, Class 4 water treatment and wastewater treatment, Class 3 water distribution and wastewater collection, 20 years
- Michael Josephson, Class 3 water treatment and wastewater treatment, three years
- Rick Sheichuk, Class 2 water treatment and wastewater treatment, three years
- Jeff Huber, six months
- Scott Suschinsky, five months

“We don’t have lead operators because they all take turns in the different positions, but they all report to either of the two waterworks managers,” says Buchholzer.

Holmes observes, “We like to involve the operators as much as possible. We keep them motivated by giving them credit for a job well done and by making them feel a sense of accomplishment. They all enjoy an opportunity to make Yorkton a better community.”

DECREASING COSTS

Today the Queen Street plant can treat 5.8 mgd. At \$33 million, it was the largest municipal project in Yorkton’s history, yet it cost one-third as much as a conventional backwash water treatment system.

Savings from the backwash filter treatment system are expected to be \$3.7 million in capital and \$6.3 million in operation costs, based on a 30-year plant life expectancy. Consolidating the water supply system to one location dramatically reduced heating and energy costs, travel time and fuel consumption.

Two of the old plants and a summer seasonal plant were decommissioned, and the third old plant was converted to a pumping station. “The existing 1.5-million-gallon reservoir was in good condition and required minimal upgrading,” says Buchholzer. Excess earth excavated for the



“All operators are engaged in their work and will step forward when needed. They put in extra time and participate in plant tours for schools, universities and service groups.”

GLEND A HOLMES

Scott Suschinsky makes adjustments to the filters.

new reservoir, water treatment plant and settling ponds was used to construct six multipurpose sports fields west of the treatment plant.

Raw water is aerated (Evoqua Water Technologies) to oxidize iron and manganese, and chlorine is added to further remove manganese and act as a disinfectant. Potassium permanganate is added to aid in oxidation and recharge the manganese greensand filters.

As the water slowly moves through a series of concrete tanks, the oxygen, along with the chlorine and potassium permanganate, react with the iron and manganese. After a two-hour detention time the water is passed through upflow roughing filters and then to greensand gravity filters (28 inches of greensand on 20 inches of anthracite atop a Leopold underdrain).

About 260,000 gpd of filter backwash water is sent to a backwash pit, then immediately pumped to outside sedimentation ponds. From there the water flows into a linear wetland, fishpond and infiltration pond. The entire process, including the 14 wells, is automated with an Allen/Bradley/Wonderware SCADA system (Rockwell) that allows continuous monitoring and immediate response to changes in water quality.

AUTOMATED PLANT

A team of seven operators had a hand in designing the new plant and was encouraged to visit it during construction to get familiar with the design. “We discussed design concepts, equipment and filtration systems,” says Buchholzer. “The operators chose aeration equipment and open gravity filters, which allow for visual inspection of the filter media.”

Learning the SCADA system was a bit of a challenge, says Holmes. “The old plants were manually operated, but since we had an older SCADA system at the wastewater treatment plant it didn’t take the staff long to become familiar with the capabilities of the water plant SCADA system.”

Queen Street Water Treatment Plant, Yorkton, Saskatchewan

FOUNDED: | 2012

POPULATION SERVED: | 20,000

SERVICE AREA: | City of Yorkton

SOURCE WATER: | 5 aquifers, 14 wells

TREATMENT PROCESS: | Aeration, flocculation, prefiltration, manganese greensand filtration

DISTRIBUTION: | 96.9 miles of water mains

SYSTEM STORAGE: | 4.8 million gallons

KEY CHALLENGES: | Operator turnover, aquifer protection

ANNUAL BUDGET: | \$1.05 million (water treatment operations)

WEBSITE: | www.yorkton.ca

GPS COORDINATES: | Latitude: 51°11'43.27" N; longitude: 102°28'48.32" W

STEPPING UP

Besides operating and maintaining the water treatment plant, the operators run the 6.3 mgd H.M. Bailey Water Pollution Control Plant, a semiautomated secondary treatment facility 4.5 miles from the water plant. Operators perform lab work at both plants and maintain the wells, water tower, pumping station, settling ponds and lift station.

“They also prepare and review safe work practices and procedures and work as a group on problem-solving,” says Holmes. “All operators are engaged in their work and will step forward when needed. They put in extra time and participate in plant tours for schools, universities and service groups.”

(Continued on page 33)

Not Just for the Big Guys

DOUG OUELLETTE BELIEVES TEAMWORK IS ALL THE MORE IMPORTANT AT SMALLER FACILITIES. LESSONS FROM A MANAGEMENT BOOT CAMP HELPED HIM BUILD A SOLID TEAM.

By Ann Stawski

Great teams are built on solid foundations. Doug Ouellette, superintendent at the Jamestown (R.I.) Wastewater Treatment Facility, knows teamwork matters all the more when a staff is small.

Ouellette has assembled a strong team of three, including David Greene, assistant superintendent, and Paul Robertson, operator. He is invested in helping both acquire the knowledge and skills they need. Ouellette draws on his two colleagues' experience and expertise and encourages them to succeed.

The plant sits on a small island in Narragansett Bay and serves about 1,200 customers. The extended aeration process treats 350,000 gpd; design capacity is 720,000 gpd.

JACKS OF ALL TRADES

In his 15th year managing the facility, Ouellette sets the tone for his team to work together effectively. He stresses that each member must know what is going on at all times. "We need very open lines of communication because if one person is off for the day or at another site, the others must fill in," he says.

Ouellette serves as a facilitator, sponsor or coordinator, depending on each situation. Having worked up through the ranks, he has the background, information and experience for each job. He also knows how to let his team members put their abilities to work.

“I will continue to send my team to employee development sessions because it benefits not only each person, but the whole team. It makes us stronger.”

DOUG OUELLETTE

"We all work well together — we have to," he says. "At larger facilities there may be people who stay with specific tasks. But in our smaller department, we have to be more versatile with a large knowledge base. We do everything ourselves."

HELP FROM THE OUTSIDE

In a state where there are only 19 sewer departments, the Jamestown team could feel isolated. To promote knowledge sharing and continuing education, Ouellette encourages his team members to attend regional meetings and conferences.



PHOTOGRAPHY BY DAVE HANSEN

The team at the Jamestown Wastewater Treatment Facility includes, from left, David Greene, assistant superintendent; Paul Robertson, plant operator; and Doug Ouellette, plant superintendent.

tell us about your team

This feature in TPO aims to help clean-water plant leaders develop strong, cohesive operating teams. We welcome your story about team-building at your facility.

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

Ouellette is a graduate of the first Wastewater Operator Management Boot Camp, sponsored by the Rhode Island Department of Environmental Management (DEM). "It was new and no one knew what to expect," he says. "Initially I thought, 'OK, I'll try this out.' By the final session I had gained a lot of exposure to other facilities and wastewater professionals. It was worth my time."

Through the boot camp, Ouellette identified management skills he needed to strengthen and expanded and improved his management style and communication ability. Working on those areas, he brought a renewed focus on management, teamwork and extending the facility's reach into the community.

Ouellette believes a superintendent must put the facility's needs in the forefront so the assets can be properly maintained. "It's important for the administration to know what is going on," he says. "That helps avoid any unknowns down the road."

REACHING OUT

The boot camp also helped him get over his discomfort with public speaking: "Now with the training I received, even though I still prefer not to, I can do it."

He actively educates decision-makers. "I am proactive in my communications with the administration and the town manager," he says. "I provide a broader picture of operations and that has helped improve relationships. We're out ahead, as much as we can be, of issues and activity, and that's positive."

Whether communicating to elected officials, the media or community residents, Ouellette and his team are thoughtful in their presentations. "I'm much more forthright in educating others on what our wastewater department does," he says. "We are more than ditch diggers. This is a professional field with career options." Good communication has helped raise awareness that the Jamestown team's work is important to the community.

LEARNING FOR THE STAFF

Knowing the benefits he gained from development programs, Ouellette extends such opportunities to his team members. He encouraged Greene and Robertson to attend the DEM Boot Camp, as well as training programs and conferences offered by state and industry associations. Those sessions increase their understanding of processes and procedures and elevate their communication skills. In turn, staff members bring new ideas and improved processes back to the plant.

“These programs provide a new perspective and a broader picture of operations outside our facilities,” Ouellette says. “For example, through the training David now has a better understanding of our fiscal responsibility and the way we’re operating.”

Ouellette tries to identify each member’s strengths and areas for growth. He takes learning beyond employee development to team development. “We share information and we work well together,” he says. “We can sit down, discuss ideas and plan for improvements. I will continue to send my team to employee development sessions because it benefits not only each person, but the whole team. It makes us stronger.”

SENSE OF COMMUNITY

Rhode Island has a tight-knit wastewater community where departments work with one another. Connections are important to the Jamestown team’s development. “We may see other departments at trade shows, but through events like the boot camp we work closely with one other,” Ouellette says. “We share information and discuss regulatory and compliance issues. We make stronger connections.”

Ouellette encourages his team to develop relationships with team members at other plants, large and small. To that end, the team tours other facilities. “On-site visits help us establish a baseline as to how we run our facility, what we know and what we can do to improve operations,” says Ouellette. “As an operator attending classes and site visits, Paul is gaining greater exposure to other facilities. This helps us to see where we are compared to others in how we operate and what we can improve.”

Through his own development, Ouellette rose to the challenge of continuous improvement in all aspects of his job and of fostering teamwork across functional and department boundaries. It’s an excellent way to place a clean-water facility on a strong foundation. **tpo**



Doug Ouellette, plant superintendent, tries to identify each team member’s strengths and put them to work for the benefit of the facility.



(Continued from page 31)



Operators including Norman Parachoniak had a hand in designing the new Queen Street Water Treatment Plant.

Their greatest challenge is running separate water and wastewater facilities with different certifications. “We expect them to operate both plants and rotate back and forth,” Holmes says. “They have to know both equally well and keep up their certifications in both. We are always looking for new learning opportunities and are open to any classes the operators may find interesting and beneficial. We encourage them to obtain the highest certification possible and we cover the cost of courses and time to attend.”

The 23-year-old water pollution control plant was advanced when it was built. Some of the plant’s seven buildings are connected by tunnels that house equipment and utility lines. One building houses boilers that heat the facility with methane produced from anaerobic digestion. Biosolids are used for farm fertilizer or in the city’s large-scale composting program at the sanitary landfill.

“With more stringent federal wastewater regulations being proposed for 2015, the wastewater plant will need upgrading,” says Buchholzer. “Although we could probably use some of the existing equipment, we would have to go to nutrient removal.”

FUTURE CHALLENGES

Buchholzer says the city’s greatest future challenge is protecting the aquifer. “We’re trying to increase public awareness of the nature and value of local groundwater sources by showing the link between an aquifer and a community’s drinking water supply,” he says. “The realization that drinking water comes from a vulnerable underground supply can lead to increased interest in protection measures.”

Another challenge will be finding and retaining qualified operators. “They have to have four years of post-secondary education equivalent to a college or university degree for this position,” Buchholzer says. “We start them at the lowest level and train them in hopes they will stay. While most have stayed [see sidebar], some have retired and a few have left for better wages.”

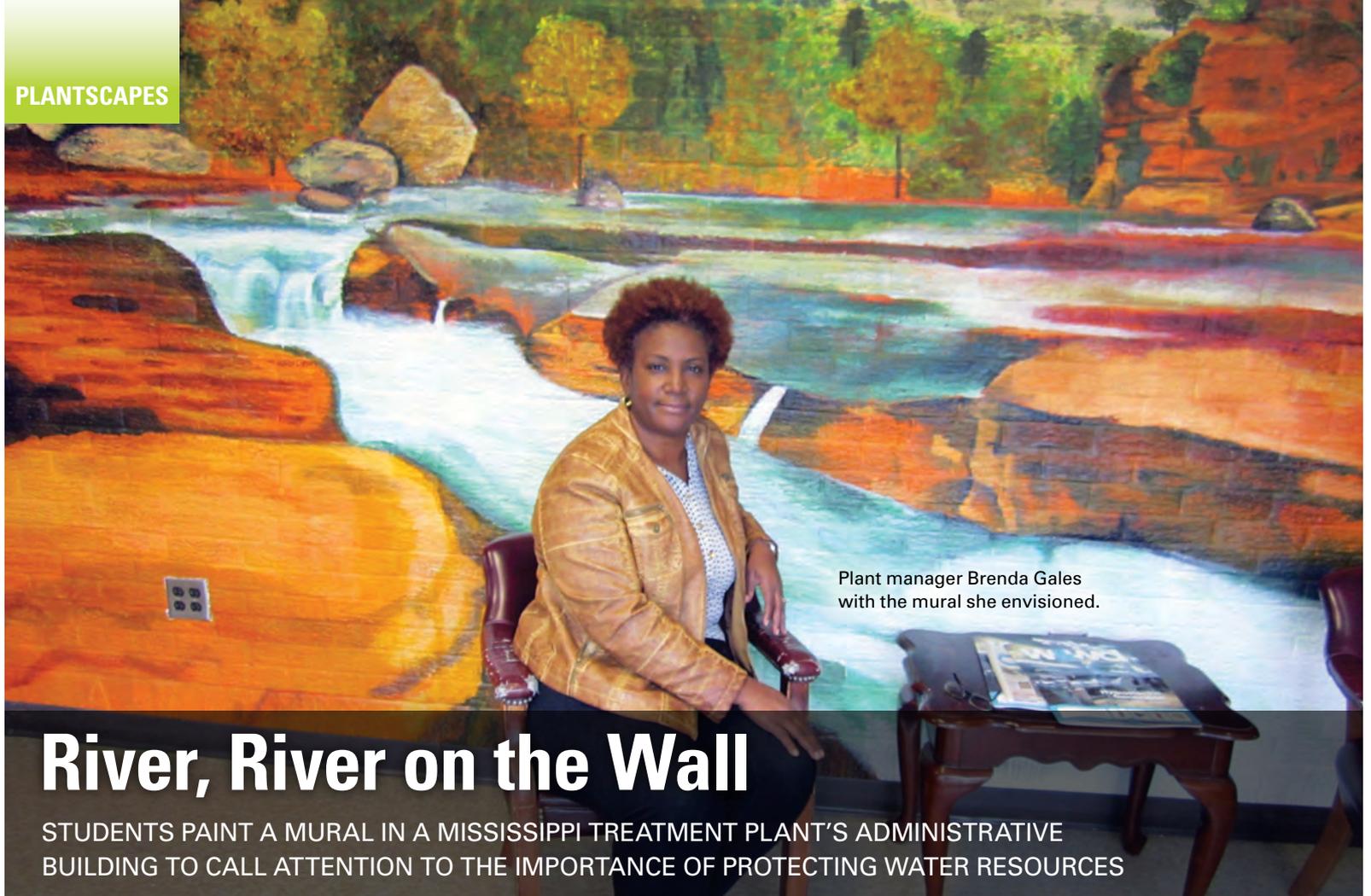
Buchholzer says the staff enjoys operating a plant that can produce such a high-quality product (0.110 NTU turbidity, 1.59 ppm total chlorine, 0.020 ppm iron, 0.021 ppm manganese). “Our final objective is to work with the Saskatchewan and Yorkton Wildlife Federations to stock our final settling pond with rainbow trout,” he says. “Its park-like setting allows residents to relax, get back in touch with nature and remove themselves from the city environment.” **tpo**

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Plant manager Brenda Gales with the mural she envisioned.

River, River on the Wall

STUDENTS PAINT A MURAL IN A MISSISSIPPI TREATMENT PLANT'S ADMINISTRATIVE BUILDING TO CALL ATTENTION TO THE IMPORTANCE OF PROTECTING WATER RESOURCES

By Jeff Smith

A mural that graces a large wall of the City of Greenville's wastewater treatment plant helps connect the facility with its community.

Entitled "Greenville Falls" and painted on an interior wall of the administration building, the 20-foot-long by 10-foot-high mural shows the water cycle and reflects the benefits people derive from clean water.

"It's the first thing visitors see when they enter the plant," says Brenda Gales, manager of the 10 mgd (average flow) activated sludge facility. "It's also the starting point for the many tours we conduct for visitors and students of our local schools and colleges."

STUDENT PROJECT

The idea behind the mural is to educate youth about ecosystems and the footprint each person leaves. Gales and Adrick McMiller, assistant plant manager, came up with the idea in 2012. They contacted Renaissance Scholars, a Greenville nonprofit that motivates, inspires and prepares middle school students for college and provides art-centered and other learning opportunities not usually found in classrooms.

With the help of volunteers from the local chapter of the Teach for America organization, students sketched a design for the mural on the wall. Up to a dozen students showed up on most weekends during the summer to paint the mural, supervised by Teach for America artists Allayna Burman and Darrell Hicks. Some students painted for a couple of hours, and some stayed all day. The project was complete before students returned to school in the fall.

Plant operators laid the groundwork for the student artists by clearing the mural area and stripping the brick wall of photos and award plaques. They also repaired irregularities and conditioned the surface for painting. "Now they make sure the mural is dusted and clean for all the visitors to enjoy," Gales says.

POSITIVE IMPACT

Gales is proud of the mural and its impact on the community, and especially proud of the students who painted it. "We wanted to reiterate the importance of clean water and show what we do here at the plant," says Gales. "We wanted to show that the end product is something people can enjoy in activities like fishing, swimming and boating."

Students from middle schools and high schools take annual tours of the plant and get an overview of the wastewater treatment process. College students from Delta State and Mississippi Valley State universities conduct group training sessions at the plant as part of their environmental science programs.

The mural shows a majestic river cascading through a valley of red clay rocks and a waterfall with deciduous trees in full fall colors against gray stone cliffs. It was unveiled during a ceremony in August 2012 attended by city officials and the artists. Special guests included Mary Hardy, director of Renaissance Scholars; Brad Jones, public works director; and the plant staff including Maple Smith, administrative assistant, and Jack Davis, Class IV operator.

Says Gales, "We want to make sure people know that water is a resource and that we all need to do our part to keep it clean and pollution free for everyone to use." **tpo**



Artist Darrell Hicks applies the first brush strokes on the mural project.

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Three 1.5 MW wind turbines at the Field's Point Wastewater Treatment Facility will cut about \$1 million off the plant's annual \$2.5 million electric bill.

Making Wind Affordable

THE FIELD'S POINT WASTEWATER TREATMENT FACILITY EXPECTS TO SAVE MORE THAN \$1 MILLION PER YEAR THROUGH A WIND ENERGY PROJECT FUNDED BY LOW-INTEREST LOANS

By Doug Day

Three large wind turbines are helping to power the Field's Point Wastewater Treatment Facility, saving money and reducing carbon dioxide emissions. The \$14 million project will save more than \$1 million per year out of the plant's \$2.5 million electric bill.

Owned by the Narragansett Bay Commission (NBC), the team at Field's Point in Providence, R.I., began studying the feasibility of wind power in 2006 with a \$35,000 grant from the U.S. EPA and \$25,000 from the state Office of Energy Resources.

A QUICK PAYOFF

The three 1.5 MW turbines went online in October 2012 at reduced capacity while some issues with connecting to the electrical utility grid were solved. Even with several months operating at 40 to 80 percent capacity, the turbines met NBC's minimum goal. "Over the first year they provided about 42 percent of our electrical needs," says Jamie Samons, public affairs manager. "We had determined it would be a win if we hit 40 percent."

The turbines achieved full capacity in February 2014. In the first five months they produced 54 percent of the plant's energy. Winds do drop in

“It was about six years from the time we started the wind studies until the turbines were operational. It does take a while.”

JAMIE SAMONS

summer, so the annual production is expected to be about 45 percent, or some 7 million kWh per year.

While saving money, the turbines will reduce carbon dioxide emissions by 3,000 tons per year by displacing fossil fuels to the power plant, the state's fifth largest electricity user. The plant provides secondary treatment for up to 77 mgd (average 55 mgd).



The 150-foot blades from North Dakota power Chinese-made turbines and sit atop 210-foot towers made in Tennessee. The turbines begin generating power at wind speeds of just 6 mph and can operate in winds up to 50 mph.

PATIENCE REQUIRED

"It was about six years from the time we started the wind studies until the turbines were operational," says Samons. "It does take a while." The initial 18-month study looked at wind data, environmental impacts and economics. It determined that the site had enough wind resources to support three 1.5 MW turbines.

The original plan called for turbines 400 feet tall to the edge of the blades. However, the Federal Aviation Administration objected because the plant sits along the edge of the glide path to the T.F. Green Airport, the state's largest. The FAA originally set a height limit of 265 feet.

At that level there was not enough wind to make the project economically feasible, so NBC sought help from the airport in analyzing the height restrictions. After further study and with significant involvement from U.S. Sen. Sheldon Whitehouse, the FAA agreed to 365-foot-tall turbines. "It took 18 months of going back and forth with the FAA," says Samons. All told, it took three years from the start of feasibility studies to receive the go-ahead to pursue wind energy.

NBC received a loan for the project from the Rhode Island Clean Water State Revolving Fund at 1.7 percent interest, well below market rates. The state says its low-interest loans reduce project costs by 17 percent. "We had some venture capitalists and others look at it," notes Samons. "It seems the turbines are efficient enough to be a good deal for us, but I don't know that they would be commercially viable."

POSITIVE FEEDBACK

Public reaction to the project has been positive. "We are located in the Port of Providence," says Samons. "Our neighbors are a scrap metal company and some liquefied natural gas tanks. But we've had pretty great response to the turbines, even from people across the river on the West Bay of Rhode Island."

Still, there was some controversy that can serve as a lesson for others considering wind projects. NBC built the turbines first, then did all the wiring and underground work. "So the turbines were up and not spinning for several months," says Samons. "I was the one who got all the angry phone calls — 'What's the problem? Why aren't they working? Is this a big boondoggle?'"

While people understood once it was explained, a change in the construction schedule would have helped avoid some of the perception problems.

MIX OF PROVIDERS

The Gilbane Building Company of Rhode Island developed the project with consulting assistance from Barnhart Crane & Rigging of Tennessee. General Electric offered technical assistance and advice even though it generally is involved in much larger wind farm projects.

Gilbane chose a multisynchronous turbine design from Goldwind USA for its efficiency and ease of maintenance. Goldwind is a subsidiary of Goldwind Science and Technology of China, so 15 percent of the turbine was made in China. That made the project ineligible for stimulus grant funding from the U.S. government.

The 1.5 MW permanent-magnet direct-drive turbines have just one moving part. The design uses no gears, bearings or couplings and no slip rings or carbon brushes in the generator. That reduces maintenance and increases life expectancy. The turbines kick in at just 6 mph wind speed and can operate in winds up to 50 mph.

The 150-foot turbine blades were manufactured by LM Wind Power of Grand Forks, N.D. The 210-foot towers are from SIAG Aerisyn in Chattanooga, Tenn. The treatment plant staff operates the wind farm and Goldwind maintains the turbines.

Power from the wind farm goes directly to the treatment plant first. Any excess is purchased by National Grid, the local utility, through a net meter-



Being near an airport glide path held up the wind project for about 18 months. The Federal Aviation Administration finally allowed 365-foot towers after first ruling they could be no more than 265 feet high. Lower towers would have doomed the project; wind speeds at 265 feet would have been inadequate.

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SUSTAINABILITY BY DESIGN

Like many clean-water agencies, the Narragansett Bay Commission has been installing variable-frequency drives, high-efficiency pumps, lighting upgrades and other conservation measures. The new 19,000-square-foot administration building at the Field's Point Wastewater Treatment Facility is certified to LEED Silver standards.

"The building has 2,400 square feet of green roofs, low-e glazing on the windows and graywater systems," says Jamie Samons, public affairs manager. "It was built with recycled materials." It has won several awards, including one for sustainable design for KITE Architects.

Plant effluent is reclaimed for irrigating the landscaping, which features drought-resistant native plants. The building also hosts a stormwater education center surrounded by rain gardens. A new laboratory building at Field's Point, scheduled to open in 2015, is also designed to LEED Silver standards.

ing agreement. "There are days when we generate everything we need and provide some electricity onto the grid," says Samons. "Hopefully we'll be able to substantially reduce our energy costs and our reliance on fossil fuels."

Samons says alternative energy is part of NBC's strategic plan: "It not only saves money for ratepayers, but as an environmental agency it is one of our responsibilities." **tpo**

Challenges *Met*

THE YELLOW SPRINGS TEAM FINDS THE FUNDS AND MAKES THE IMPROVEMENTS TO PRODUCE QUALITY EFFLUENT, MEET STRICT PHOSPHORUS LIMITS AND HANDLE PEAK FLOWS

STORY: **Jim Force**

PHOTOGRAPHY: **Amy Voigt**

WHEN JOE BATES BECAME SUPERINTENDENT OF the Yellow Springs (Ohio) Water Reclamation Facility eight years ago, he knew he had a lot of work to do. And he knew it couldn't be done for free.

"There was a lot of deferred maintenance here," he recalls. "The attitude was, 'If you can rig up something to keep it running, do it. But don't spend any money.' They were penny pinching.

"The village had signed an agreement with the EPA to upgrade treatment, and we were going to have to spend money to get the plant up to speed. But I also knew there were no funds for construction."

That's when he put his ingenuity to work and helped the community, located about 15 miles east of Dayton and home to Antioch College, secure \$750,000 through the American Recovery and Reinvestment Act of 2009 (federal stimulus) and nearly \$1.13 million in grants from the Ohio Public Works Commission.

He also persuaded city fathers to reserve some of the village's borrowing capacity for wastewater treatment plant improvements. "Yellow Springs is a tourist attraction, so a lot of our money normally goes into roads and other civic improvements," Bates says.

The investment totaled \$3 million, and because of it the plant is much improved, color coded with Bates' creative building painting scheme. The facility has also been recognized multiple times for safety.

FLOW THROUGH

The treatment facility employs a biological phosphorus removal system and disinfection to create high-quality effluent that flows to Yellow Springs Creek and eventually to the Little Miami River, part of the National Scenic Rivers network. Design flow is 0.6 mgd.

At the top of the plant, a 6 mm Headworks International bar screen removes rags and debris ahead of a vortex grit removal system, supplied by WesTech Engineering (WEMCO grit pumps supplied by Weir Specialty Pumps).

Wastewater then passes through a Parshall flume to the biological system, configured for phosphorus removal.



Buildings at the Yellow Springs facility are brightly painted and color-coded.

Yellow Springs (Ohio) Water Reclamation Facility

BUILT: | 1964 (upgrade in 1988 and 2012)

POPULATION SERVED: | 3,500

SERVICE AREA: | Village of Yellow Springs (2.02 square miles)

FLOWS: | 0.6 mgd design, 0.422 mgd average

TREATMENT PROCESS: | Activated sludge with biological phosphorus removal

TREATMENT LEVEL: | Secondary

RECEIVING WATER: | Yellow Springs Creek

BIOSOLIDS: | Anaerobic digestion, land application

ANNUAL BUDGET: | \$373,000 (operations)

WEBSITE: | www.yso.com

GPS COORDINATES: | Latitude: 39°48'29.62" N; longitude: 83°53'14.44" W





“ We have to meet a phosphorus requirement of 1.0 mg/L during the summer months. In winter, we sample and test but don't have a requirement that we must meet.”

JOE BATES

Joe Bates, water and wastewater superintendent, shown near the plant's aeration basin.



The Yellow Springs plant went through a significant upgrade to achieve the excellent treatment it now delivers.



The team at the Yellow Springs Water Reclamation Facility includes, from left, Richard Stockton, water and wastewater operator I; Joe Bates, water and wastewater superintendent; and Brad Ault, water and wastewater operator II.

Yellow Springs Water Reclamation Facility PERMIT AND PERFORMANCE (2013 averages)

	INFLUENT	EFFLUENT	PERMIT
BOD	145 mg/L	2.29 mg/L	10 mg/L
TSS	129 mg/L	0.895 mg/L (BDL*)	12 mg/L
Phosphorus	3.62 mg/L	0.895 mg/L	1 mg/L (summer only)
Ammonia	29 mg/L	0.18 mg/L (BDL*)	0.7 mg/L

* Below detection limits

“We have to meet a phosphorus requirement of 1.0 mg/L during the summer months,” Bates says. “In winter, we sample and test but don’t have a requirement that we must meet.” The bio-P process consists of nine tanks that make up five stages of treatment.

In the first stage, return activated sludge combines with raw influent. That is followed by three covered anaerobic stages. An open aerobic zone concludes the series. Submersible mixers (WILO USA) blend contents in the anaerobic stages. The aerated stage employs submersible mixers (also WILO) and fine-bubble aeration (three Hoffman & Lamson blowers, WYSS Flex-A-Tube diffusers from Parkson Corp.). Control of the air supply is based on oxidation reduction potential.

“If we can maintain a consistent mixed liquor, that gives us the most consistent treatment when it comes to phosphorus removal,” says Bates. “That’s our biggest challenge. We don’t like to use ferric chloride to aid phosphorus removal because it’s expensive and the plant can get addicted to it. It’s really just a last resort to meet permit if we have to use it.”

A series of gates enables his staff to manipulate flow, especially to protect the process during high flows that result from significant inflow and infiltration in the collections system. “We can direct flows to the second stage or bypass the second stage and go directly to aeration when we have a highly

diluted storm flow in the latter stages of a rain event,” says Bates.

Two 50-foot-diameter, 20-foot-deep Envirex circular clarifiers (Evoqua Water Technologies) accept the treated water, which is then disinfected with chlorine gas, dechlorinated with sodium thiosulfate and discharged. Bates likes the way the plant operates and has effluent numbers to back him up: TSS, BOD and ammonia are regularly below detectable limits. But it wasn't always this way.

WORKING BETTER

Bates ticks off a list of improvements that were necessary to bring the plant to its current level of excellence, starting right up front. “The headworks were in the cheapest building I’ve ever seen, with just enough heat in it to keep things from freezing,” Bates says.

The bar screen and grit removal system were essentially exposed to the atmosphere, suffered regular breakdowns and were near the end of their useful life, he reports. “Plus, the grit removal system was not compatible with phosphorus removal. It was aerated, and phosphorus removal requires anaerobic conditions as much as possible.” Bates oversaw the construction of a modern concrete block building with enough heat and controls to house the new bar screen and cyclonic grit removal and classifier apparatus.

Another problem was I&I. Bates recalls one day when the plant flow surpassed 6.5 mgd because of stormwater. Anything above 2 mgd was simply bypassed directly to chlorination, sending diluted, chlorinated sewage to the creek. That, along with the need for phosphorus removal, drove new permit requirements.

An equalization basin has been the answer. “During high flows we can divert up to 2.5 million gallons to the EQ tank for storage,” says Bates. “The plant can handle 4 mgd.” The EQ tank capacity is based on the 6.5 mgd spike recorded a few years back. “We looked at the highest number we could push through,” says Bates.

Yellow Springs is paying attention to the weaknesses in the collections system, although Bates and his department are not responsible for that. The village is addressing the issues by elevating manholes, conducting smoke tests and disconnecting downspouts and sumps from the sanitary sewer system.

OUT WITH PHOSPHORUS

The bio-P system takes the place of an old conventional activated sludge treatment train, and the clarifiers have been modified. “We love these clarifiers because of their depth,” says Bates. “But they shared a single withdrawal line for the return activated sludge.” The plant team added a second parallel line to enable more precise control of the sludge blanket in each clarifier.

“Less than a foot deep works best for us with biological phosphorus removal,” Bates says. “There’s no release of phosphorus below the blanket.” A set of new baffles in the clarifiers has improved overflow water clarity.

Changes continue, and they include a new building to contain chemicals and a switch from sodium bisulfite to less-corrosive sodium thiosulfate for



Bates uses tools including this YSI IQ SensorNet 2020 XT to monitor water quality.

ALLIANCE WITH YSI

It's unusual for a community as small as Yellow Springs to be the site of a major wastewater treatment equipment supplier, but that's the case here, and the community's water reclamation facility enjoys unique benefits as a result.

“YSI, a major instrumentation company, was founded by two graduates of Antioch College and its headquarters is still here,” says Joe Bates, water and wastewater superintendent. “We use several of their instruments and they use us to test out new products in a real wastewater environment. It has been a great relationship.”

Rob Smith, YSI wastewater applications engineer, agrees. “We're running tests on our new P700 phosphate analyzer at the plant,” Smith says. “They have a phosphorus limit and do biological phosphorus removal. They need to better understand the dynamics of the process and avoid the use of expensive ferric chloride if they can. Right away, they can see the effects of tweaking the process with the analyzer.”

“It's a healthy two-way relationship. Basically, we get a chance to get real online data and the plant team gets to see how online data can make operation better. For a small plant, they have a diverse process. Joe and his staff have been very cooperative. They're very much interested in technology and using it to improve their operation.”

disinfection. “The bisulfite caused a lot of corrosion,” says Bates. “We lost a heater that corroded above the bisulfite storage area.”

The biosolids area has a new 30-square-foot cake storage pad, and operators have begun using polymer and geotextile bags (US Fabrics) to dewater solids, especially in winter. The anaerobically digested solids slurry is pumped



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“We use a trailer-mounted belt press dewatering service every four to six months, but the bags require very little up-front expense and give us flexibility in dewatering.”

JOE BATES

into the bags through an injector hose and clear water is filtered out. The cake is stored on the pad until area farm fields are ready for application.

“We use a trailer-mounted belt press dewatering service every four to six months, but the bags require very little up-front expense and give us flexibility in dewatering,” says Bates. “The operators say they like using them, and they give us extra storage capacity in the digesters.”

They also save money. Bates calculates that the bags save \$2,500 to \$3,000 per batch over the cost of the mobile press.

HANDLING SIDESTREAMS

Sidestream treatment is another upgrade. “The filtrate off the belt press and the supernatant off the digesters contain high concentrations of phosphorus, and they must be treated chemically for phosphorus removal,” says Bates.

The plant maintains two sidestream tanks and fills one tank at a time when the mobile belt press unit is operating. “Then we take a sample and determine the phosphorus concentration,” says Bates. “We use ferric chloride and aerate and settle the contents before we pump the water back into the plant. That way the recycle doesn’t affect the biological process. Having two tanks gives us the cushion to keep the belt press operation running.”

While attending to the deficiencies with the old plant, Bates and Brad Ault and Richard Stockton, licensed water and wastewater operators, have found time to rack up an impressive safety record. For each of the past 10 years the plant has received an Ohio safety certificate, and in 2010 it won the



Operator Richard Stockton uses a suspended solids analyzer (InsiteIG).

Ohio Safety Award for plants with up to nine employees. In 2013 Yellow Springs won the Water Environment Federation’s George Burke Safety Award for Ohio.

And then there’s the WEF Operator Ingenuity Award for the plant color scheme. “Yellow Springs is a very artsy town, very colorful,” says Bates. “So we decided to paint our buildings different colors.” The more dangerous buildings like gas storage are orange, headworks is red, the administration building is yellow, and the RAS pump room is lavender. A new effluent shed will be green, “to show that we’re a lot greener than before.”

People like the colors: “It makes the plant a lot more cheerful than what people might have perceived it to be like.” **tpo**

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Robuschi & C.S.p.A.
Rochester Metal Products Corp
RODDIE Inc.
Roeda Signs & ScreenTech Imaging
Roll-Off Paris.com
RootX
Roth Global Plastics
ROTHENBERGER USA
RotoSolutions
RouteOptix Inc.
RS Technical Services Inc.
Rush Refuse Systems
Rush-Overland Manufacturing
Sabre Manufacturing
SAERTEX multiCom LP
Safety Sewer Drain
Salcor, Inc.
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Saveresen, Inc.
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(SES, Inc.)
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Supressur 4S Inc.</p> | <p>SVE Portable Roadway Systems, Inc.
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Terdylon Inc.
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Thieman Tailgates, Inc.
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Zoeller Pump Company</p> |
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Education Day Sessions

Monday, February 23, 2015

NAWT

National Association of Wastewater Technicians
Room 234-236

- 8 a.m. | Pre-Trip Inspections
- 9:30 a.m. | Hours of Service (HOS) Overview
- 11 a.m. | Roadside Inspections
- 1:30 p.m. | Environmental Impact Study: Effects of Water Softener on Septic Tank Performance
- 3 p.m. | A Study of Microbiological Induced Corrosion
- 4:30 p.m. | Ask the Expert Q & A

WJTA-IMCA

Water Jet Technology Association
Industrial Municipal Cleaning Association
Room 140-142

- 8 a.m. | Hydroexcavation — Tools to Stay Current in a Changing Marketplace
- 9:30 a.m. | Maximizing Productivity on Vacuum/Air Mover Projects
- 11 a.m. | Waterblast Safety Can Enhance Productivity, Quality and Profits!

SSCSC

Southern Section Collection Systems Committee
Room 231-233

- 8 a.m. | Combination Vacuum Unit Operation Overview
- 9:30 a.m. | Been There, Done That, Got The T-Shirt (Small Business From a Hands-on Perspective)
- 11 a.m. | So You Think You Are the Best? CCTV Inspection In Its Highest Form
- 1:30 p.m. | Avoid the Pitfalls — Trenchless Pipeline Repair and Renewal
- 3 p.m. | NOZZLES, NOZZLES, NOZZLES!
- 4:30 p.m. | Ask the Experts Q & A

SSPMA

Sump and Sewage Pump Manufacturers Association
Room 243-245

- 1:30 p.m. | Sizing Guidelines for New or Replacement Sewage Pumps
- 3 p.m. | Backup Battery and Combination Pump Systems Evaluation and Installation
- 4:30 p.m. | Specifying Pumps: Why Do Pumps Fail?

NASSCO

National Association of Sewer Service Companies
Room 130-132

- 8 a.m. | Overview of Manhole Rehabilitation Technologies
- 9:30 a.m. | When, Why and How to Defeat Infiltration Cost Effectively
- 11 a.m. | New Opportunities in Small-Pipe Relining and Reinstatement
- 1:30 p.m. | Pipeline cleaning Best Practices
- 3 p.m. | Large-Diameter Pipe and Drain Rehabilitation Technologies
- 4:30 p.m. | Ask the Experts Q & A

NEHA

National Environmental Health Association
Room 237-239

- 8 a.m. | New Technologies for Non-Potable Water Use
- 9:30 a.m. | Rules & Regulations with New Technologies and Working with Regulators
- 11 a.m. | New Technologies for Non-Potable Water Use Part 2
- 1:30 p.m. | OSHA Regulations and Smart Business
- 3 p.m. | Sales & Marketing with New Technologies
- 4:30 p.m. | Ask the Experts Q & A

NOWRA

National Onsite Wastewater Recycling Association
Room 240-242

- 8 a.m. | Lobbying
- 9:30 a.m. | Field Inspections Part One
- 11 a.m. | Field Inspections Part Two
- 1:30 p.m. | Septic Tank Safety — Lethal Lids
- 3 p.m. | Time Dosing
- 4:30 p.m. | Ask the Experts Q & A

Portable Restroom Track

Beverly Lewis
Room 243-245

- 8 a.m. | Mastering the Busy Season
- 9:30 a.m. | A Great Customer Experience
- 11 a.m. | Employee Retention and Recruitment

Business Track

Kelly Newcomb, Ellen Rohr, Women's Roundtable
Room 136-138

- 8 a.m. | Grow or Go! Why Most Companies Fail to Grow Effectively and What You Can Do to Keep Your Company From Failing
- 9:30 a.m. | Target Marketing: How to Effectively and Efficiently Grow Your Sales
- 11 a.m. | Effective Branding and How it Can Help Your Business
- 1:30 p.m. | Business Basics 101
- 3 p.m. | Build the Business You REALLY Want
- 4:30 p.m. | Women in Wastewater Roundtable Discussion

Gil Longwell
Room 140-142

- 1:30 p.m. | Protecting Private Enterprise

Marketing Track

Susan Chin
Room 133-135

- 8 a.m. | Ladies and Gentleman: Create Your Personal Brand and Strategic Network for Success in 5 Easy Steps
- 9:30 a.m. | Effective Website Design and Engaging Customers in the Digital Age
- 11 a.m. | Tapping into the Power of Social Media and Content Marketing

Road Rules & Safety Track

John Conley
Room 133-135

- 1:30 p.m. | A Trucker's Guide to Washington Speak
- 3 p.m. | Cargo Tank Safety and Regulatory Report
- 4:30 p.m. | Compliance with Part 180 and Preparing for a Tank Truck CT Shop Audit

You can view the complete schedule of events along with an exhibitor list, floor plan, travel information and everything else you'll need to plan your trip to Indy at wwett.com



Tuesday Sessions

Detailed session information available at: wwett.com

February 24, 2015

NAWT Track

Room 234-236

- 8 a.m. Septage Processing Introduction:
Working with an Engineer
- 9:30 a.m. Analyzing Your Resources:
What Goes on Around You is Important!
- 11 a.m. Introduction to Odor Control

Onsite Installer Track

Room 231-233

- 8 a.m. Soils, Design, O&M: What Every Installer
Should Know
- 9:30 a.m. Best Installation Practices for
Trouble-Free Pump Controls
- 11 a.m. Introduction to Effluent Filters

*MSW Track

Room 237-239

- 8 a.m. Mapping Solutions for Repair and
Maintenance of Water Distribution Systems
- 9:30 a.m. The Shift from Reactive to Proactive
Wastewater Management Best Practices
- 11 a.m. Why Hasn't Your Sewer System Evaluation
Survey Testing Worked?

*MSW - Municipal Sewer & Water

Treatment Plant Operator Track

Room 240-242

- 8 a.m. An Emerging Technology for Lagoon-Based
Nutrient Removal
- 9:30 a.m. The New Wastewater: Collection System
Challenges Caused by Today's Modern Trash
- 11 a.m. Wastewater Microbiology

Industry Safety Track

Room 243-245

- 8 a.m. New Trends and Technology in Equipment
for Excavation Safety
- 9:30 a.m. Best Practices: Use, Care and Repair of
High-Pressure Sewer Cleaning Hose
- 11 a.m. Development and Execution of a Cross-Bore
Prevention Program

Business Track

Room 130-132

- 8 a.m. How to Position Your Company in the Market Today
- 9:30 a.m. Six Proven Tactics to Generate Leads and
Turn Them Into Revenue
- 11 a.m. Growth by Acquisition or Exiting Gracefully:
Buying or Selling a Septic or Sewer Business

Drain Cleaning Track

Room 133-135

- 8 a.m. Drain Cleaning Methods - Then and Now
- 9:30 a.m. The Physics of Pipe Cleaning Tools and
How I Make it Work for Me
- 11 a.m. Lateral Lining - Are You Using the Right Tool?

Industry Technology Track

Room 136-138

- 8 a.m. How to Manage Septic Systems
using Remote Monitoring
- 9:30 a.m. GPS Tracking: Hype Vs. Reality
- 11 a.m. Wireless Controls in the Waterjet Industry:
Sacrificing Safety for Convenience

Septic Series Track

Room 140-142

- 8 a.m. True Crime Scene Stories: How to Inspect
and Troubleshoot Suspect Onsite Systems
- 9:30 a.m. One Man's Waste is Another Man's Treasure
- 11 a.m. Dewatering Options for Roll-Off Containers



*Complete contest rules and details at: wwett.com/rules



Wednesday Sessions

Detailed session information available at: wwett.com

February 25, 2015

Septic Series Track

Room 140-142

- 8 a.m. Considerations in Building Your Next Vacuum Truck
- 9:30 a.m. Grease Collection and Treatment:
Raising the Bar Via Resource Recovery
- 11 a.m. Analyzing Common Onsite Septic System
Malfunctions and Options for Prevention & Correction

*MSW Case Study Track

Room 231-233

- 8 a.m. Retrofit of the Lansdowne Sanitary P/S
- 9:30 a.m. Huntington Beach Successfully Navigates
Emergency Repair of Fragile Storm Drain
Collection System Rehabilitation –
Alternative Technology
- 11 a.m. Collection System Rehabilitation –
Alternative Technology

*MSW Technology Track

Room 237-239

- 8 a.m. Implementation of Acoustic Inspection Technology
at the City of Augusta
- 9:30 a.m. Highlights from the 7th Edition of Operation
and Maintenance of Wastewater Collection
Systems Manual
- 11 a.m. Technological Advancements Fulfill the
Promise of Zoom Survey Paradigm

*MSW - Municipal Sewer & Water

Portable Sanitation Track

Room 136-138

- 8 a.m. Portable Sanitation - Special Events
- 9:30 a.m. Making Your Portable Restroom Business Lean
and Mean – How to Boost Productivity and
Increase Your Bottom Line
- 11 a.m. T.B.D.

Treatment Plant Operator Track

Room 240-242

- 8 a.m. Utility Regulation Basics for Grease Haulers
- 9:30 a.m. The Waste in Our Wastewater
- 11 a.m. Security Issues and Best Practices for Water/
Wastewater Facilities

Pipe Rehab Track

Room 243-245

- 8 a.m. Integrating Temperature Sensor Technology
within Lateral Pipeline CIPP Installations
- 9:30 a.m. CIPP Calibration and Vacuuming
- 11 a.m. Extending Life Expectancies with Corrosion-
Resistant Coatings and Linings

Business Track

Room 133-135

- 8 a.m. Team Building for Profit
- 9:30 a.m. Ten Commonsense Ways to Grow and
Improve Your Business
- 11 a.m. Setting Expectations – The Key to Sales
and Customer Satisfaction

Advanced Onsite Installer Course

Room 234-236

8 a.m. - 5 p.m.

- Introduction and Site Evaluation
- System Sizing and Basic Design Principles
- Pumping to Systems
- Installations of ATUs
- Installing for Management
- Troubleshooting Systems

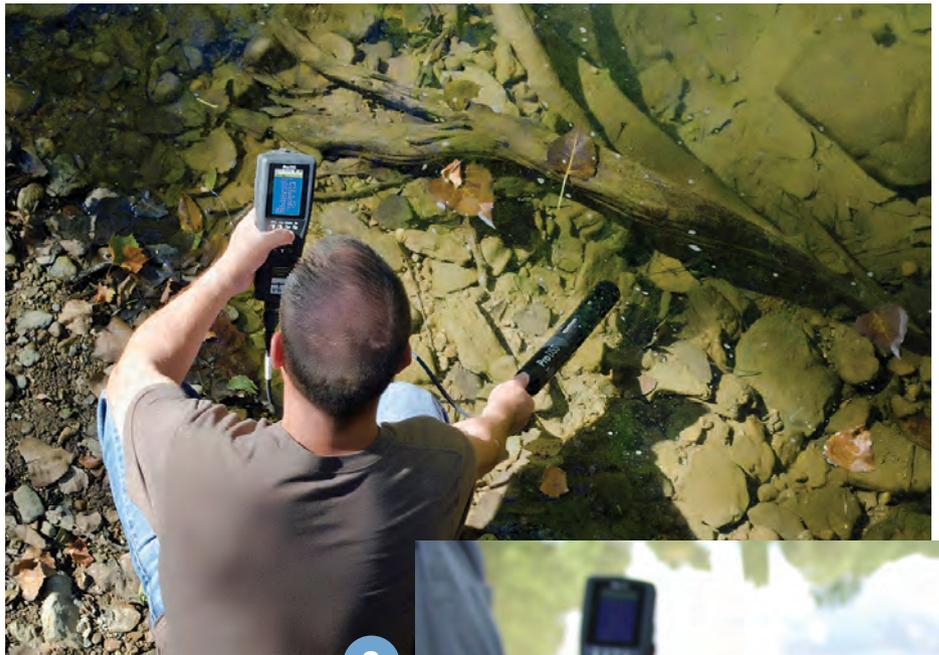
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- 1) The ProDSS meter incorporates multiple sensors in a single probe.
- 2) The meter is designed for spot sampling of groundwater, reservoirs, lakes and other waters.
- 3) Multiple sensors connect via one cable to the hand-held unit. This means users do not have to take multiple instruments into the field.



Built for the Field

A HAND-HELD MULTIPARAMETER DIGITAL SYSTEM FACILITATES SPOT SAMPLING FOR MONITORING GROUNDWATER, RESERVOIRS, RECEIVING STREAMS AND OTHER WATERS

By Ted J. Rulseh

Water utilities often need to look upstream at conditions in their source water; wastewater agencies sometimes need to explore conditions in waters downstream of their discharge.

These investigations require instruments that are accurate and portable and stand up to the harsh realities of life in the field. YSI, a Xylem brand, now offers a multiparameter hand-held meter designed to meet those needs.

The ProDSS (Digital Sampling System) instrument puts capability for multiple measurements in one lightweight hand-held device. It uses smart sensors that can measure up to 17 parameters, and it has a one-cable design for user convenience.

It is suited for applications including groundwater and reservoir sampling, lake and watershed studies, and wastewater treatment plant receiving water testing. Laura St. Pierre, a senior product manager in water-quality systems with YSI, talked about the technology in an interview with *Treatment Plant Operator*.

tpo: What need was YSI aiming to fulfill with this offering?

St. Pierre: Typically, utilities doing surface water- or groundwater-

quality studies need five main parameters: temperature, dissolved oxygen, pH, conductivity and ORP. We've always had compact instruments for sampling those five. However, many utilities also need to measure turbidity and sometimes depth. We now provide that capability in a compact instrument. We always could measure those parameters and then some on our larger systems, but those really are not ideal for spot sampling. They are larger and better suited for continuous deployment. The ProDSS, being much lighter and more portable, is especially suited for spot sampling.

tpo: What specific attributes make this device suitable for use in the field?

St. Pierre: It's designed to stand up to harsh conditions. The rubber-over-molded case with metal, military-spec connectors is IP-67 waterproof and drop-rated to 1 meter. It has a color display and a backlit keypad so it can be used in any lighting condition. It uses a rechargeable lithium-ion battery that lasts about 20 hours. Users can easily get their sampling day in without using alkaline batteries and having to throw them away. The sensors are durable for field use with laser-welded titanium bodies.

“The sensors analyze the signal coming from the sensor head and process it into measurement data, then digitally send that data up the cable to the hand-held unit. That yields very accurate measurements.”

LAURA ST. PIERRE

tpo: What are the advantages of the smart sensor technology?

St. Pierre: The sensors analyze the signal coming from the sensor head and process it into measurement data, then digitally send that data up the cable to the hand-held unit. That yields very accurate measurements. It also allows us to use cable lengths up to 100 meters for applications such as reservoir and lake management studies. The sensors are also digitally recognized by the instrument as soon as they are plugged in. That makes it easy to set up. It also shortens the time from box to field: Users don't have to go in and enable parameters or turn measurement units on. Calibration data stays with the sensor so the sensor doesn't have to be reconfigured every time it's plugged into the unit.

tpo: How many sensors can be used simultaneously?

St. Pierre: There are four sensor ports, so users can measure with any combination of four sensors at a time. We also offer ammonium, nitrate and chloride sensors as options. The sensor data enables other calculated parameters. For example, the conductivity/temperature sensor also calculates specific conductance, salinity and total dissolved solids [TDS].

The cable can be ordered with or without depth sensing, which does not occupy a sensor port. The depth measurement uses the barometer in the hand-held unit to compensate for atmospheric pressure. That results in highly accurate depth measurements without the need for a vent tube that comes up the cable and back-vents the pressure transducer to the atmosphere. This high-accuracy sensor helps users know exactly the depth at which they are taking their DO, pH, turbidity and other measurements.

tpo: What is the idea behind the one-cable configuration of this device?

St. Pierre: We have four sensors on the cable assembly that goes into the water. The one-cable design, in which all the sensors connect to one cable going to the hand-held unit, means users don't have to take multiple instruments or instruments with multiple cables and separate probes into the field. It's a lot easier and faster to measure with one instrument.

tpo: What can users do with the measurement data they collect with the instrument?

St. Pierre: They can easily download the data to a PC by way of a USB port on the instrument. Or they can back it up directly to a USB stick. They just connect a USB stick, click "Back Up Data" and all the data is sent to the USB stick as a CSV file.

tpo: What measurement methods do the smart sensors use?

St. Pierre: We use a combination of optical and electrochemical sensors. The DO and turbidity probes are optical. The pH, ORP, ammonium, nitrate and chloride probes are ion-selective electrodes [ISEs]. The conductivity probe is a standard 4 nickel conductivity cell, and the depth probe is a pressure transducer.

tpo: Does this device provide any mapping capability?

St. Pierre: Yes — utilities can order it with GPS capability. That allows users to log coordinates with the measurement data so they can map it later. Our KorDSS data management software with geomapping capability is included with the instrument.

“The one-cable design, in which all the sensors connect to one cable going to the hand-held unit, means users don't have to take multiple instruments or instruments with multiple cables and multiple probes into the field.”

LAURA ST. PIERRE

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tpo: What is required for calibration to sustain measurement accuracy?

St. Pierre: Users should calibrate this unit just as they would any other water-quality sampling instrument. Optical sensors hold their calibration longer than ISEs, so for example the turbidity and DO sensors will hold their calibration longer than the pH, ammonium or nitrate sensors. We recommend verifying the calibration regularly to determine how often calibration is needed. New, clean sensors require less frequent calibration than aging or dirty ISEs.

tpo: What maintenance does the device require?

St. Pierre: It needs to be kept clean and be well rinsed after use. The only regular maintenance is to change the DO sensing cap about once every 18 months. Other than that, it's just a matter of keeping the battery charged. It can be recharged through a PC, through an AC wall outlet or with an external portable power pack of the type used for cellphones. **tpo**

Testing Success Made Easier

AN OREGON OPERATORS' GROUP DEVISES CERTIFICATION REVIEW CLASSES TO HELP PROFESSIONALS FROM AROUND THE STATE IMPROVE SUCCESS ON EXAMS

By Ted J. Rulseh

Certification exams often stand as obstacles to operators' advancement. Exam failure rates can be relatively high, and some operators fail exams on repeated tries.

An operators' group in Oregon is looking to remedy that by offering comprehensive two-day review classes for those seeking certifications for wastewater treatment plant and collections system operations.

The Umpqua Basin Operators Section (UBOS), one of six local sections of the Pacific Northwest Clean Water Association, offers the class in March in cooperation with Umpqua Community College. Two separate sections are offered, for Grades I and II and Grades III and IV certifications. The courses allow operators to review information appropriate to the level of certification they are seeking, improve their wastewater math skills and work together in small-group problem-solving sessions.

Steve Miles, a systems asset manager with Orenco Systems Inc. and an Oregon Grade IV certified operator, is a member of the Oregon Department of Environmental Quality's Operator Certification Advisory Committee and worked with the UBOS group to develop the review classes, which are open to operators all around the state. Miles talked about the classes and their benefits in an interview with *Treatment Plant Operator*.

tpo: Why did UBOS develop these classes?

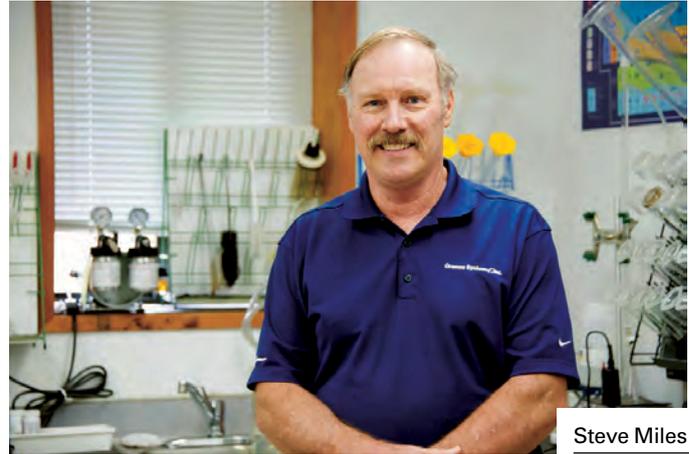
Miles: The Operator Certification Advisory Committee often discusses exam passing rates and other issues, and I bring those issues back to UBOS. One thing we were looking at was some sort of operator certification review class. We had one or two in Oregon, but they were rather generic one-day classes covering both water and wastewater operators. We wanted to create something more specific to wastewater and collections system operators.

“At the upper grades, III and IV, we were seeing only about half the people pass, and quite a few folks were taking the exams multiple times and still not passing.”

STEVE MILES

tpo: What did the pass-fail rates look like in Oregon?

Miles: At the upper grades, III and IV, we were seeing only about half the people pass, and quite a few folks were taking the exams multiple times and still not passing. At Grade I, the passing rate was probably 70 to 80 percent, and at Grade II maybe 60 to 70 percent. As we moved up the ladder there was a lower percentage of passing. It's probably the same story throughout the country. Of course at the higher levels more difficult and complex questions are asked, and that's what we want, because at those levels operators are accepting more responsibility and running bigger and more complex plants.



Steve Miles

tpo: Why did you see review classes as a potentially good remedy?

Miles: We were looking at ways to help operators study for the exams. For most operators it has probably been quite a few years since they were in school. And one of the areas they seem to struggle with is mathematics. We wanted to provide something that wrapped everything together — math, wastewater operations, troubleshooting.

tpo: Why did you decide to work with a community college to offer the classes?

Miles: UBOS has often coordinated with Umpqua Community College. In the past few years we've worked with them to put on short schools and conferences. They have a community education department specifically to support offerings like those. We have expertise in the wastewater business, so we developed the course. The college helps us with the registration, the paperwork, the promotion and collecting the course fees. They are used to doing all that and they have the staff to do it. We charge a fee to cover our cost and pay our instructor. After the class, some of the money goes to UBOS for scholarships and other purposes, and some goes to the college's community education department. So it's a win-win.

tpo: How did you arrive at the structure for the classes?

Miles: We decided we really needed to break it down. We didn't want to teach Grade I material to folks trying to get to Grade III and IV, and vice versa. So we split it into a two-day session for Grades I and II and a two-day session for Grades III and IV. We include both collections and treatment operators because there is a lot of overlap between those two areas. Maybe in the future we'll break it down even further and offer separate treatment and collections classes.

tpo: Who is the instructor?

Miles: We're fortunate to have Michael Fritschi, who is general manager of South Suburban Sanitary District in Klamath Falls. He has a bachelor's degree in environmental engineering, has taught sanitary engineering practice and management, has experience in public works and holds a Grade IV wastewater operator certification in Oregon. He is a very sharp, engaging teacher, and folks really seem to enjoy his teaching style. He was a perfect match for us because he's not very far from our location and has plenty of experience.

tpo: How well have operators embraced these classes?

Miles: Last year was our third year, and participation has increased every year. For the classes last March we had 27 participants in Grades I and II and 22 in Grades III and IV.

tpo: What does the curriculum for Grades I and II include?

Miles: The first day covers wastewater math necessities, sanitary sewer flow rates and velocities, influent loading and preliminary and primary treatment. The instructor then has the class break up into groups and solve problems. That allows the folks who understand a little better to help the others. At the end of the day they do some practice testing. The second day goes into collections and lift stations, secondary treatment, sanitary sewer construction, disinfection, lab methods and operational tools. At the end, each person does a practice exam.

tpo: What about the class content for Grades III and IV?

Miles: For the upper levels the topics change. They still cover math and they get into solving wastewater word problems, where they have to take a sentence or two describing a problem and make it into an equation. A lot of operators have difficulty with that, so we give them plenty of examples. Then they delve into wastewater management issues, safety and maintenance, as well as the basic wastewater topics at a higher level of complexity.

tpo: How does the class help operators improve their math skills?

Miles: We teach a technique called dimensional analysis for solving wastewater problems. It shows a way to convert equations to make it easier to get to the right answer. For most operators it's a new way of looking at math problems. There's also a method called the Davidson Pie that's used for determining mass, concentration and flow rate. If you visualize, it's a circle divided in half with the bottom half divided into thirds. Operators have called it the Circle of Life because it has saved a lot of them by helping solve some of the math problems.

tpo: What about general advice on how to succeed on exams?

Miles: There are some test-taking techniques to learn. Oregon uses 100-question multiple choice exams. We advise operators, for example, to look at each question carefully and really understand what it is asking. Is it asking for gallons? Milligrams per liter? They need to make sure they understand the question before giving an answer.

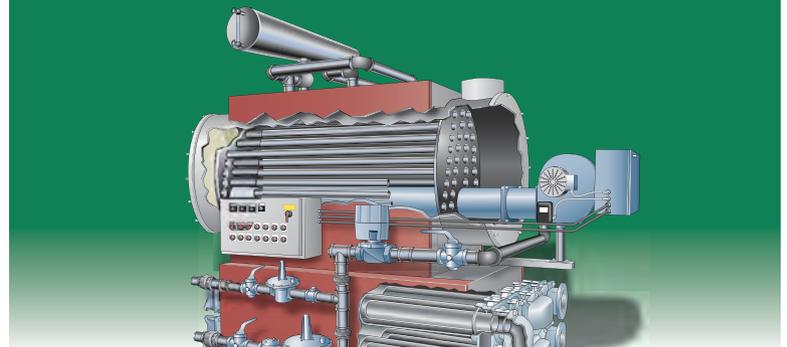
tpo: How does taking the classes affect the need for other exam preparations?

Miles: We emphasize that these review classes are not a substitute for studying. Operators still need to do their due diligence. We recommend they study for exams well in advance. There are plenty of books out there to study from. The courses are just a good opportunity to review, practice and ask questions. When you study by yourself, you have nobody to ask. In a class the instructor can give you the clues and hints you need to figure things out.

tpo: Have you been able to measure the impact of these classes on pass-fail rates?

Miles: Statistics on that are not available, but based on operators' feedback the classes definitely appear to be helping. After taking the exam, operators have told us they thought the review course helped them quite a bit.

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They're real happy they took the course and they come back for more if they're trying to go to the next level.

tpo: Do these classes qualify operators for continuing education credits?

Miles: Yes. Operators in Oregon need two CEUs every two years to keep their certification active. The Oregon Environmental Services Advisory Council has approved the review courses for 1.2 CEUs. This helps make them more attractive to the operators and to the city or utility managers who need to approve and pay for the operators' attendance.

tpo: What advice would you give to other operator groups who might like to replicate these classes in their areas?

Miles: First, get together as an association and start a discussion. If you have a local community college, go talk to their community education staff. Chances are they will be excited to help. Then find an instructor — and it doesn't have to be just one person. You could have three, four or five or more. You might pull in one person for a math session, another for process control and so forth, just as it's often done for conferences and short schools. Ideally a group would work together to create a syllabus and then start contacting local people in the industry. You can also ask your regional association to help you out.

tpo: Ultimately, what is the value of these review classes?

Miles: Most people don't realize that a wastewater plant and collections system make up the biggest asset a typical community owns. They represent millions and millions of dollars in assets. We need highly qualified operators to run these valuable systems that help protect public health and the environment. It's worth putting in time to educate and train operators not only to pass the exams, but to do the best job they can at the plants where they work. **tpo**



Country music singer/songwriter Cole Swindell (left and center) takes the stage at the WWETT Show's Industry Appreciation Party on Feb. 25 in Indianapolis. Country-rock band Blackjack Billy (below) opens the evening's entertainment.



On the Rise

BUDDING COUNTRY MUSIC STAR COLE SWINDELL HEADLINING THE WWETT SHOW INDUSTRY APPRECIATION PARTY

By Kyle Rogers

Country music singer/songwriter Cole Swindell is one of Nashville's newest stars, and he plans to make some new fans when he takes the Industry Appreciation Party stage at the Water & Wastewater Equipment, Treatment & Transport Show in February.

The 31-year-old didn't gain prominence — or a record deal for that matter — until his independently released debut single, "Chillin' It," started climbing the charts in 2013. It eventually reached the top spot on the U.S. *Billboard* Hot Country Songs chart, but Swindell knows there's a good chance some people in the audience will be unfamiliar with his material. And he's fine with that.

"Sometimes it's good to get in front of a new crowd that might not know a lot about you," Swindell says. "You get to try to make them a fan by the end of the night. I love challenges like that."

"I'm going to get up there and do what I do. I'm looking forward to it."

LESSONS FROM A FELLOW GEORGIAN

Though still a newcomer to the country music scene, Swindell knows what it takes to put on a good show. He went on tour with Luke Bryan in 2014 and prior to that spent a considerable amount of time on the road with him, selling merchandise and writing songs for his fellow fraternity brother from Georgia Southern University as Bryan evolved into a country music star.

"For however long he's out there on stage, he's going to give it all he's got. That's something I've learned," Swindell says. "People spend their hard-earned money and their time to come see us, so you want to give them the best show you can."

He says Bryan was also a big influence on his decision to launch a career in country music in the first place.

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COLE SWINDELL

"The first time I heard his music was over 10 years ago and I thought he had it," Swindell says. "Even then I was like, 'This guy is going to be huge.' He's from the same part of Georgia but I didn't know him until I had gotten to college and he had already moved to Nashville. Having a guy from just a few minutes from where I grew up writing songs I thought were amazing, that gave me the confidence. 'Hey, if he can do it, maybe I can do this.' It really gave me the confidence to go after it and just focus and work hard."

FROM SONGWRITING TO STAGE

Swindell says he has been a fan of country music all his life, but he didn't start singing until he was in college and began playing the local bars. After receiving the merchandise sales gig on Bryan's team after graduation, Swindell started to get into songwriting. He has written Bryan's "Just a Sip," "Beer in the Headlights," "Roller Coaster," "Out Like That," "I'm Hungover," "I'm in Love with the Girl," "Love in a College Town," "Shore Thing," "Shake the Sand" and "The Sand I Brought to the Beach." He's also written songs for Craig Campbell, Thomas Rhett, Scotty McCreery and Florida Georgia Line.

Following the success of "Chillin' It" in 2013, Swindell received a record deal. The first single off his debut album, "Hope You Get Lonely Tonight," which was co-written with Florida Georgia Line, also became a hit. It reached No. 1 on the U.S. *Billboard* Country Airplay chart.

Rugged, Reliable Equipment

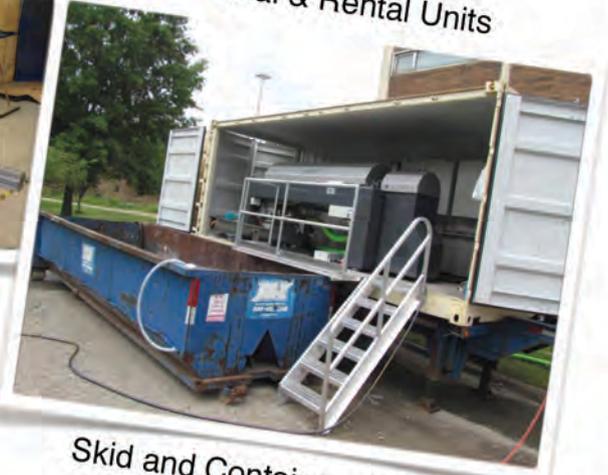


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"I didn't even have a record deal when we wrote that song," Swindell says. "I always thought they were going to record it. The second they said it was cool that I recorded it, I told them, 'This will be a single for me one day if y'all let me record it.' The writing process was fun. They're good friends of mine and I'm so proud of all their success. It's cool to get to have a little bit of each other's success."

With his first two singles each topping the charts, Swindell says there's pressure to continue the trend but he doesn't mind it.

"You come out with a No. 1 single and then you have to follow that up and you get fortunate and have two No. 1's. Then you have to follow that up. But I think that's a good thing, you know? The streak's not going to go on forever and I'm realistic, but we're going to try. I want to give the fans and radio the best songs I can, and I think [reaching No. 1] is a good goal. If you don't reach the No. 1 spot at least you gave it a shot."

THE COMING YEAR

His debut album, two straight No. 1 singles and a nomination in the Best New Artist of the Year category at the Country Music Association Awards have made the past year quite the start to Swindell's country music career. For the coming year he's already scheduled to join Jason Aldean for the second leg of the "Burn It Down" tour beginning in February.

"Jason is another huge influence and there's another Georgia boy so, man, I couldn't have picked anyone better to go on tour with. That's going to be an awesome way to start off 2015," Swindell says.

That same month he will be taking a break from the tour to play the more intimate Sagamore Ballroom venue at the Indiana Convention Center for WWETT attendees. Swindell says his hope is that he can add a little "pleasure" to the "business" that will undoubtedly be a primary focus for many trade show attendees that week.

"They could've picked a lot of people [to play the Industry Appreciation Party] and for me to get to do it, that's cool," says Swindell. "It's a different

THIS PARTY AIN'T NO ONE-TRICK PONY

Cole Swindell may be the big draw at the **WWETT Show's Industry Appreciation Party** on Wednesday, Feb. 25, but he won't be the only highlight that night.

It all begins at 4 p.m. when the doors open to the party's new venue, the Sagamore Ballroom on the second floor of the Indiana Convention Center. The 25-cent tap beers start flowing at 5 p.m. and the evening's first musical act, Blackjack Billy, will take the stage an hour later. The four-member Nashville-based band is best known for their 2013 debut single "The Booze Cruise."

The winner of the WWETT truck giveaway will be announced shortly after Blackjack Billy's set, at approximately 7 p.m. All registered WWETT attendees are automatically entered into the contest for the tricked-out 2014 Chevrolet Silverado 1500 4x4 Extended Cab, or alternately \$35,000 cash, being given away in celebration of the show's 35th anniversary. Twelve contestants will be randomly selected beforehand and invited to participate in the event that will determine a winner.

The party will conclude with a performance from Swindell, who is set to take the stage at 7:30 p.m.

setting [than a tour stop] and there will be business folks in there, but I want to let them have a little fun that night. That's going to be my goal — make sure they have a good time."

For more information on the WWETT Show, visit wwett.com or call 866/933-2653. tpo

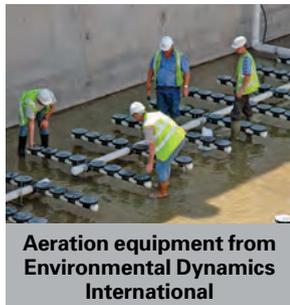
Biosolids Management and Headworks

By Craig Mandli

Aftermarket Parts/Service

AFTERMARKET AERATION EQUIPMENT

Environmental Dynamics International offers aftermarket aeration parts and systems from most major brands and all aeration technologies. Offerings include the Aeration Works service division, Dif-fuser Express parts division and the O Factor energy savings calculator. 573/474-9456; www.wastewater.com.



Aeration equipment from Environmental Dynamics International

Belt Filter/Rotary Presses



Screw Press from Alfa Laval

MODERATE-SPEED SCREW PRESS

The Screw Press from Alfa Laval offers moderate rotational speed, low power consumption and continuous operation with minimal supervision. The moderate speed results in a low noise and low spare parts demand.

Applications include dewatering of municipal and industrial biosolids and biogas production residues. 866/253-2528; www.alfalaval.us.

PRE-THICKENING SCREW PRESS

The DSP Screw Press from BDP Industries offers pre-thickening with a rotary drum concentrator. A feed flow of 100 gpm at 0.8 percent solids will thicken to 5 percent solids, reducing the flow to the screw press to 16 gpm (84 percent). It offers pressurized feed to the screw auger via the thickened biosolids transfer pump. Its slotted screen provides a large filtration area and effective liquid extraction. A tapered shaft screw auger compresses the slurry. A filtrate recycle system improves solids capture. 518/527-5417; www.bdpindustries.com.



DSP Screw Press from BDP Industries



Rotary press from Fournier Industries

ROTARY DEWATERING PRESS

The rotary press from Fournier Industries uses two slowly rotating screens to create a 2-inch channel that biosolids pass through as they dewater. A pressure restrictor on the outlet allows the operator to vary final cake dryness. The unit has few components and is designed for ease of maintenance. The totally enclosed design mitigates odors and keeps operators out of direct contact with biosolids. The control system allows for unattended opera-

tion. The unit can be equipped with a single dewatering channel or expanded with up to six channels. 418/423-4241; www.rotary-press.com.



ACAT screw press from Kusters Water, division of Kusters Zima Corp.

SLOW-ROTATING SCREW PRESS

The ACAT screw press from Kusters Water, division of Kusters Zima Corp., dewater biosolids using a slow rotational speed, leading to low maintenance, low noise and low energy consumption. All wetted materials are made of stainless steel for corrosion resistance. 864/576-0660; www.kusterswater.com.

Chemical/Polymer Feeding Equipment

POWDERED ACTIVATED CARBON FEEDER

The stainless steel VF-100 powdered activated carbon feeder from Eagle Microsystems uses a direct drive for harsh chemical feed environments. It can be optimized for any PAC application with options including dust collectors, flex-wall agitation, explosion-proof motors, wetting cones, solution tanks, flow-pacing control, extension hoppers and multiple screw and motor ranges to accommodate any feed rate. The feed rate is regulated by an electronic silicon-controlled rectifier speed control. 610/323-2250; www.eaglemicrosystems.com.



VF-100 activated carbon feeder from Eagle Microsystems



DynaBLEND liquid polymer activation/dilution/feed systems from Fluid Dynamics Inc.

LIQUID POLYMER SYSTEM

DynaBLEND liquid polymer activation/dilution/feed systems from Fluid Dynamics Inc. are designed to activate all types of liquid polymers. They have nonmechanical mixing chambers with an injection check valve designed for ease of disassembly, inspection and cleaning. 215/699-8700; www.fluidynamics1.com.

POLYMER FEED MONITOR

The IBC Tote Scale from Force Flow/Halogen allows accurate measurement polymer fed from IBC-type totes for dewatering. Users place the tote on the platform and monitoring begins with nothing to install inside. Systems prevent overfeed conditions and enable documentation of the amount fed. Amounts can be remotely monitored from SCADA or PLC. The unit is available with a SOLO G2 digital display or a Wizard 4000 chemical inventory monitoring system. 800/893-6723; www.forceflow.com.



IBC Tote Scale from Force Flow/Halogen



ParaDyne liquid polymer activation systems from IPM Systems

LIQUID POLYMER ACTIVATION SYSTEM

ParaDyne liquid polymer activation systems from IPM Systems have a low-maintenance neat polymer check valve, a non-impinging rotor, no recirculation of solution and a seal flush valve. The chamber handles up to 20 gpm of water, and a post-dilution line can be added to achieve an additional 20 gpm. The neat polymer check spring is outside

the polymer flow path, eliminating polymer gumming or clogging around the spring. The chamber uses a non-impinging rotor that pulls polymer through the mixing zone instead of pushing it with an impeller. The solution does not recirculate through the mixing zone, eliminating partially hydrated polymer molecules. **855/328-9200; www.ipm-sys.com.**



High Density Lime Systems from MERRICK Industries

LIME FEED SYSTEM

High Density Lime Systems from MERRICK Industries can be designed with turndown ratios of 50-to-1 using the same size piping systems and controls for calcium hydroxide slurries above 30 percent by weight. In the “pump-to-use” point, users can stop pumping at any time without concern for plugging slurry lines. Pumps can be stopped up to three to four days without flushing. High-density slurry systems do not scale, reducing maintenance and downtime and improving water quality.

850/265-3611; www.merrick-inc.com.

POLYMER MAKEDOWN SYSTEM

Pulsablend polymer makedown systems from Pulsafeeder are available in automatic and manual versions with a three-step static blending system that provides dilution without harming the polymer chains. With a wide range of dilution using a choice of three water flow rates (0 to 5 gpm, 5 to 10 gpm, and 10-plus gpm) the Static Blending System is custom sized to activate all types of polymers without motorized mixing. Five polymer pump flow rates are available. Systems include an auto-fill calibration column, an adjustable flowmeter and a polymer backpressure regulator to maintain a consistent final product. **800/333-6677; www.pulsatron.com.**



Pulsablend polymer makedown systems from Pulsafeeder

Composting Equipment

COMPOST ACCELERATOR

BCP85 Compost Accelerator from Bionetix International is a blend of bacteria, yeast, enzymes and nutrients to accelerate and optimize degradation of household and agricultural organic wastes. Microorganisms and nutrients enrich the material to be degraded and yield an enriched fertilizer. The product provides microbial diversity for maturation and degradation of compost. It contains minerals, amino acids, peptides and vitamins for growth and metabolic activity of microorganisms including bacteria, yeast and fungi. It provides basic element nutrients often missing in organic waste. **514/457-2914; www.bionetix-international.com.**

STAGGERED ROTOR MIXER

The 34.1-cubic-yard 3410 Industrial Compost mixer from Roto-Mix has a GeneRation II Staggered Rotor that combines gentle tumbling with quick and complete mixing to deliver rapid decomposition and quality compost. Ingredients are lifted up to the side augers that move the material end to end. Total movement of material in the mixing chamber eliminates dead spots. The rotor lifts the material past the wedging point of the lower side auger, providing a fluffier mixture while lowering power requirements. The conveyor builds windrows or static piles. Additional units



3410 Industrial Compost mixer from Roto-Mix

are available in 16.7-, 23- and 27.8-cubic-yard capacities as stationary, trailer or truck-mount units. **620/338-0090; www.rotomix.com.**

Dewatering Equipment



ADS dewatering unit from AQUA-Zyme Disposal Systems

ROLL-OFF DEWATERING UNIT

The ADS 30-cubic-yard dewatering unit from AQUA-Zyme Disposal Systems can be filled with 22,000 to 25,000 gallons of grease trap waste or municipal biosolids at 1 to 2 percent solids in about two hours. After draining 24 hours, the

unit can be hauled to a landfill or other permitted facility. Biosolids volume can be reduced by 80 percent with reductions to 98 percent in BOD, COD, FOG and TSS. Effluent is clear and sewerable. The unit has few moving parts, and standard equipment includes roll-over tarp system; side, floor and center screens; 1/4-inch floor plate; seven-gauge side plates; eight drain ports; two inlet ports; and a long-handle scraper. Fifteen-cubic-yard units are available. **979/245-5656; www.aqua-zyme.com.**

SKID-MOUNTED DEWATERING SYSTEM

FKC skid-mounted dewatering systems can be set up strictly for dewatering or used to heat-pasteurize biosolids while dewatering to achieve a Class A product. Lime is added before dewatering to raise the pH to 12 in a separate agitated tank. The liquid biosolids are then pumped with polymer to the flocculation tank on the skid. Flocculated biosolids overflow from the tank into the rotary screen thickener and are then gravity-fed into the screw press where steam from a small boiler is injected, heating the biosolids to meet the time and temperature requirements. **360/452-9472; www.fkcscrewpress.com.**



Skid-mounted dewatering system from FKC



Sludge Mate container filters from Flo Trend Systems

DEWATERING CONTAINER FILTER

Sludge Mate container filters from Flo Trend Systems dewater biosolids, water treatment residuals, septage, grease trap and slaughterhouse waste, and sump bottoms. The closed system provides odor control, no spillage,

reduced maintenance and weather independence. Units have 10-gauge reinforced walls and a seven-gauge steel floor. Options include peaked roofs with gasketed, bolted-down access hatches, drainage ports, inlet manifolds, floor filters and side-to-side rolling tarps. They are available in roll-offs and in trailer and tipping-stand mounted configurations. Capacities range from 5 to 40 cubic yards. **713/699-0152; www.flotrend.com.**

HORIZONTAL BIOSOLIDS DEWATERING SYSTEM

The horizontal biosolids dewatering system from In The Round Dewatering has a stainless steel drum with perforated plastic tile lining. The drum is mounted on a roll-off frame for easy transport and



Dewatering system from In The Round Dewatering

unloading. Water trays allow containment of discharge water. An 18,000- to 25,000-gallon batch is mixed with polymer before being filtered in the rotating drum, driven by a 1/2 hp variable-speed electric motor with a heavy-duty chain and sprocket. The turning eliminates crusting and wet pockets, producing uniform, consistent results. The dewatered material dumps easily and the drum is self-cleaning. **317/539-7304; www.itrdewatering.com.**



Dewatering container from Wastequip

DEWATERING CONTAINER

Wastequip dewatering containers are designed for wastewater treatment facilities, manufacturing facilities, construction sites, refineries and other applications. Gasketed doors and hydro testing help ensure that containers will not leak. Removable shells allow them to be used as biosolids containers. Lid options include side-to-side roll tarps or single piece, side-to-side plastic or aluminum lids. Containers are available in round-bottom or rectangular designs in 20- or 25-cubic-yard sizes. **877/468-9278; www.wastequip.com.**

Grinders/Shredders

SUBMERSIBLE SHREDDER PUMP

S4SHR and S4SHR-LP 4-inch hydraulic submersible shredder pumps from Hydra-Tech Pumps rip and shear solids with a 360-degree shredding action. The carbide-tipped impeller and hardened macerator suction plate work together to produce a violent shredding action that keeps the discharge open. The S4SHR is suited for municipal, industrial, agricultural and institutional applications. The S4SHR-LP is narrower at 21.5 inches, allowing it to fit through most manholes. A guide rail assembly is available for stationary applications. **570/645-3779; www.hydra-tech.com.**



S4SHR and S4SHR-LP shredder pumps from Hydra-Tech Pumps



EZstrip TR Muncher grinder from Moyno

MAINTAIN-IN-PLACE GRINDER

The EZstrip TR Muncher grinder from Moyno maintains the grinder in place without removing the equipment, reducing maintenance. Equal-thrust offset cutters capture and reduce large solids for effective maceration. An angled cutter stack upflow design rejects hard materials, reducing damage to the cutter teeth. The cantilever design eliminates lower mechanical seals or bearings. A built-in trash trap with clean-out ports catches any rejected materials while low cutter tip speeds reduce power usage and noise. Each unit has a programmable logic controller to protect against damage and overloads. **877/486-6966; www.moyno.com.**

SCREW CENTRIFUGAL PUMP

Triton screw centrifugal pumps from Vaughan Company handle thick biosolids, large or stringy solids, shear-sensitive fluids and delicate or highly abrasive materials. They offer steep performance curves, nonoverloading power characteristics, heavy-duty power frames and a flushless mechanical seal. A water-flushed mechanical seal or packing is available. **888/249-2467; www.chopperpumps.com.**



Triton screw centrifugal pumps from Vaughan Company

TWIN-SHAFT GRINDER

The high-torque XRipper XRS-QG twin-shaft in-line grinder from Vogelsang reduces solids, preventing clogging and equipment damage. It has easy-maintenance one-piece cutters that need no factory reconditioning. Numerous cutter width and material options are available. It comes with high-wear cartridge mechanical seals. Flanges from 4 to 12 inches and in-channel units are available with electric, submersible or hydraulic drive options. Auto-reversing controls prevent clogging. **330/389-9145; www.vogelsangusa.com.**



XRipper XRS-QG grinder from Vogelsang

Grit Handling/Removal/Hauling

GRIT CLASSIFIER



Grit classifier from Atara Equipment

The grit classifier from Atara Equipment has a large settling area and material contact surface, leading to effective precipitation. Large and finer particles settle into the shaftless screw conveyor at the bottom of the classifying area. Settled material is transported horizontally to a vertical dewatering conveyor. The rotating action of the spiral on the material causes it to roll over on itself, releasing the attached surface liquid tension. The liquid also filters down through the product, capturing fine particles. Product can drop into a container or be transported to another area before discharge. Product dryness increases with the height of the discharge point on the vertical conveyor. **866/931-5445; www.ataraequipment.com.**

GRIT AND GREASE REMOVAL SYSTEM

The Grit & Grease removal system from Schreiber consists of two rectangular concrete channels that separate and collect grit and grease. One channel settles particles while the other collects grease. A rotating spiral flow pattern washes organics from the grit, then deposits it in a trough at the bottom of the channel. A grit pump mounted to a traveling bridge then pumps the grit to an elevated trough sloped at one end to transfer the slurry to a classifier for further washing and dewatering. Floating grease is transported to one end of the channel by an air skimming system. Air is directed onto the surface of the grease channel in the direction of a rotating screw conveyor. The screw conveyor rotates, lifting the grease for disposal in a collection container. **205/655-7466; www.schreiberwater.com.**



Grit & Grease removal system from Schreiber

Headworks

LARGE-BUBBLE MIXING SYSTEM

The large-bubble mixing system from Pulsed Hydraulics mixes wastewater for pumping from the headworks, delivering uniform raw wastewater to the first treatment basin. It provides vertical mixing, lifting solids from the bottom of the tank into the plant influent. The system incorporates an air compressor, mixer control system and bubble-forming plate, controlling the pulse of air sent. Controlled by a touch screen, the enclosure controls air pressure, pulse duration and frequency. The stainless steel bubble-forming plate at the



Large-bubble mixing system from Pulsed Hydraulics

tank bottom creates the large bubble mass that drags the liquid to the tank's surface. There are no moving parts in the tank. **800/641-1726; www.phewater.com.**

Screw Conveyors

BIOSOLIDS CAKE CONVEYING SYSTEM

NEMO BF/SF positive displacement pumps from NETZSCH Pumps North America convey dewatered biosolids from filter presses or centrifuges. A customizable rectangular hopper and force-feed chamber provide direct entry of the product into the rotor and stator. A coupling rod incorporates a positioned feed screw auger extending over the joints. The auger is always positioned opposite the open cavity of the stator, giving biosolids cake the shortest route into the open cavity, improving chamber filling. A friction loss reduction system lowers operating costs and improves system life. A ring nozzle delivers a continuous 360-degree even layer of water or polymer within the pipeline for friction and pressure reduction. **610/363-8010; www.netzsch.com.**



NEMO BF/SF positive displacement pumps from NETZSCH Pumps North America

SHAFTLESS SCREW CONVEYOR

Shaftless screw conveyors from S2S Industries are available in a thicker center axis cross section and a thinner harder steel peripheral section, or with a complete screw manufactured in hard steel. Cold rolling allows the units to be manufactured in a variety of standard and exotic materials to accommodate many abrasive applications. **514/228-1660; www.s2sindustries.com.**



Shaftless screw conveyors from S2S Industries

Septage Receiving Stations

SEPTAGE RECEIVING STATION

The Raptor Septage Acceptance Plant and Raptor Septage Complete Plant from Lakeside Equipment Corporation assist in unloading and protect downstream equipment. The systems provide security access and hauler management and accounting software to help municipalities maximize revenue generation and produce energy with minimal maintenance. **630/837-5640; www.lakeside-equipment.com.**



Raptor Septage Acceptance Plant and Complete Plant from Lakeside Equipment Corporation

DUAL-SCREEN RECEIVING STATION

The high-capacity dual-screen receiving station from Screenco Systems is made of aluminum with stainless steel screens, high sides for splash-free operation, and a collection sump with a 6-inch high-capacity drain. It has dual screens at opposing angles; the front screen is largely self-cleaning. The unit can be used to remove inorganic



Receiving station from Screenco Systems

debris from septage. It is portable with a stainless steel 3/8-inch gaped bar screen and 19.5 square feet of screening area for trash-free solids processing. The system allows gravity off-load at 500 gpm through a dump hose that telescopes and moves laterally. A fan spreader deflects the waste down on the screens for easy removal of debris to the drain tray and garbage receptacle. **208/790-8770; www.screencosystems.com.**

Screening Systems

ROTATING DRUM SCREEN

The Flo-Drum MBR Pretreatment Screen from Enviro-Care Company provides a triple face seal that creates a labyrinth that inhibits bypassing of fine solids, including hair. A cleaning brush on the exterior keeps solids contained within the

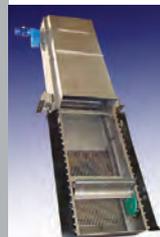


Flo-Drum MBR Pretreatment Screen from Enviro-Care Company

screen basket. Exterior spray nozzles clean the screen and provide an additional containment barrier for fine solids. The screen basket is made of 304 stainless steel (316 stainless steel optional) perforated media with 1-, 2- and 3-mm openings available. Screenings are conveyed out of the interior solids capture trough to a washing cycle and then to dewatering and discharge. Screen diameters range from 600 to 3,000 mm. **815/636-8306; www.enviro-care.com.**

WASTEWATER BAR SCREEN

The Screenmaster CS wastewater bar screen from Franklin Miller efficiently cleans bar screen racks and removes solids from channel installations. It has a front clean/front return principle, is easy to install in new or existing channels and has a small footprint. It has a continuous rotary motion in which rake heads



Screenmaster CS wastewater bar screen from Franklin Miller

penetrate the screen slots as they reach the channel bottom and lift accumulated debris to a discharge

height of up to 38 feet. The screenings drop out of a discharge chute and can be processed by a SPIRALIFT SC screenings conditioner/washer or deposited in a bin or on a conveyor. The unit is made of stainless steel for corrosion resistance and has an S320 program controller that activates on a timed basis or when a high level is indicated. **973/535-9200; www.franklinmiller.com.**

DUAL-APERTURE FINE SCREEN

Bongo dual-aperture fine screens from Ovivo are suited for pre-membrane screening. The 3 mm ProPaPanel screening panels provide a first-stage screen for removal of influent debris without excessive blinding. Internal elevators transport captured debris to an internal trough where low-pressure wash water conveys screenings to a handling system. It can also be used for water intakes or for pre-screening of any equipment that needs protection in the 300- to 1,600-micron range, but contains source water with large or sharp debris that could overwhelm or destroy a mesh screen. **512/834-6000; www.ovivowater.com.**



Bongo fine screens from Ovivo

SELF-CLEANING FINE SCREEN

The CleanFlo Monoscreen self-cleaning fine screen from WesTech Engineering uses a blade and drive system to create a progressive step motion that allows screenings to be evenly distributed while minimizing water level surges. This results in screenings capture of 82.5 percent. When matched with a CleanWash SWP/CPS dewatering unit, it maximizes solids capture for almost any headworks while minimizing solids for disposal. **801/265-1000; www.westech-inc.com.**



CleanFlo Monoscreen from WesTech Engineering

(continued)

Biosolids Handling/Hauling/Disposal/Application

DUMPSTER COVER SYSTEM

The LEVEL LODOR cover system from JDV Equipment Corporation helps contain odors by covering standard dump containers used for hauling processed material. The design allows for even distribution, increasing the fill percentage without manually evening out material. Enclosing containers allows outdoor installation without exposing material to the environment or pests. **973/366-6556; www.jdvequipment.com.**



LEVEL LODOR cover system from JDV Equipment Corporation



Knight ProSpread box spreader from Kuhn North America

COMMERCIAL BOX SPREADER

Available in truck and trailer models, the Knight ProSpread commercial-series box spreader from Kuhn North America can be used to spread compost biosolids and lime and many other solid and semi-solid materials. It has all-welded construction, a friction-resistant poly floor and a split-apron drive. It has three discharge options — horizontal beaters, VertiSpread vertical beaters and an AccuSpread spinner discharge. The beater modules can be combined with a scale system to monitor the application process and take advantage of the material's nutrient value. **608/897-2131; www.kuhnnorthamerica.com.**

CONTINUOUS BAG SYSTEM

The Longofill continuous bag system from Paxxo can connect to the discharge point of machines used to move, dewater or compact screenings, grit and biosolids. Material is then deposited in a 90-meter-long continuous bag for odor containment and spillage control. The cassette bag is easy to seal and the material and odors are trapped inside, cutting down development of bacteria and fungus spores. **770/502-0055; www.paxxo.us.**



Longofill continuous bag system from Paxxo

Biosolids Heaters/Dryers/Thickeners

COMPACT BIOSOLIDS THICKENER

The compact Ro2S Disk Thickener from Huber Technology has one turning disk, making it easy to operate and maintain and keeping electrical, water and chemical costs low. The unit accommodates fully automatic, unattended operation. **704/949-1010; www.huber-technology.com.**



Ro2S Disk Thickener from Huber Technology

BIOSOLIDS DRYING SYSTEM



Biosolids drying systems from Komline-Sanderson

Biosolids drying systems from Komline-Sanderson include a paddle dryer with dual counter-rotating shafts with intermeshing paddles and a vessel trough indirectly heated with thermal fluid or steam. The closed system generates minimal off-gas and requires no preconditioning of the feed, allowing simplified operation and low maintenance. The system produces a Class A granular material for agricultural use or can operate as a scalper to generate an autogenous green fuel. **800/225-5457; www.komline.com.**

COMBINATION BOILER/HEAT EXCHANGER

The tube-in-tube-type combination boiler/heat exchanger from Walker Process Equipment, A Div. of McNish Corp., is integrated with water piping, fuel lines, instrumentation and a complete electrical control system, including touch-screen technology. The dry-back, double-pass boiler with a forced-draft burner provides combustion efficiency and dependability. The exchanger has a biosolids/water counter-flow arrangement that provides heat transfer. The boiler maintains water temperature at 180 degrees F and ensures optimal boiler exhaust temperature as heat is transferred from the burner flame to the boiler water. The feedwater system automatically blends hot water with warm water on demand to maintain optimum heat transfer. **630/892-7921; www.walker-process.com. tpo**



Combination boiler/heat exchanger from Walker Process Equipment, A Div. of McNish Corp.

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Water Treatment Plant Mechanic
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 Fluid Dynamics Inc. DynaBLEND liquid polymer activation/dilution/feed systems
 Force Flow/Halogen IBC Tote Scale
 IPM Systems ParaDyne liquid polymer activation systems
 MERRICK Industries High Density Lime Systems
 Pulsafeeder Pulsablend polymer makedown systems

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 Screenco Systems dual-screen receiving station

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- Enviro-Care Company Flo-Drum MBR Pretreatment Screen
 Franklin Miller Screenmaster CS wastewater bar screen
 Ovivo Bongo dual-aperture fine screens
 WesTech Engineering CleanFlo Monoscreen

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Eutek HeadCell®
Advanced grit separation system

By Craig Mandli

Vertical screening system installed in challenging headworks

Problem

Four years ago the Mendocino (Calif.) City Community Services District needed to make a change at its 1 mgd wastewater treatment plant. The headworks equipment wasn't getting the job done. "It would reduce some solids to a smaller size but would pass everything through," says the district's supervisor, Steve Acker. All nonbiodegradable materials had to be manually removed. Otherwise, it would simply pass through the process or accumulate elsewhere in the facility.

Solution

The **Screenotec vertical screen** from **Aqualitec Screening Equipment** matched the district's technical requirements and footprint constraints. The unit had to accommodate a 12-foot-deep headworks design, serviced by an 8-foot-diameter manhole.



RESULT

With the vertical screen in place, solid waste accumulation dropped to a fraction of former levels. Personnel no longer had to manually clean out solids, which reduced labor costs and exposure to hazardous conditions. The screen has required no servicing since its installation. **855/650-2214; www.aqualitec.com.**

Dredge system utilized to tackle sedimentation issue

Problem

The 3.4 mgd water treatment plant in Tiffin, Ohio, built in the 1920s, faced turbidity fluctuations from 10 to 2,000 NTU. Coagulation was enhanced in the 1990s to meet regulations, but that increased sedimentation rates and exacerbated solids blanket depths. Winter proved to be problematic as icy conditions limited access, resulting in short-circuiting. The plant sought to eliminate the need to remove tanks for cleaning.

Solution

In 2010 the plant installed a **SedVac sediment dredge system** from **Brentwood Industries**. The system can fully clean the basin floor and keep up with solids production. Minimal modifications to the basin made the retrofit cost-effective.



RESULT

The basins now require cleaning twice per year instead of every three weeks, saving \$65,000 per year. The system enabled extension of the backwash interval from 24 hours to 120 to 168 hours, conserving 50,000 to 75,000 gallons of treated water per day. **610/374-5109; www.brentwoodindustries.com.**

Continuously cleaned bar screen solves algae issue, reduces maintenance

Problem

After installing a UV disinfection system, the City of Monroe, Mich., found that algae was flaking off final tanks and into the discharge, causing blockage on the UV modules and breaking the quartz lamps. Maintenance grew to one to two days each week spent hand-cleaning lamps from 18 modules.

Solution

The city chose the **FlexRake FPFS** from **Duperon Corporation** for algae removal. It already used the simple, low-maintenance screen as a preliminary screening solution. "We knew the screen would be reliable. We're able to run it 24/7, a continuous operation," says Randy Sommers, maintenance supervisor.



RESULT

The screen's continuous operation allows algae and other small particulate matter to mat for effective removal. The debris blade at the discharge cleans each scraper as it passes, eliminating the algae concern. "We've had no issues whatsoever since the installation back in 2007," says Sommers. "In fact, I haven't had to do a thing since we installed it." **800/383-8479; www.duperon.com.**

City chooses turnkey screw pump replacement

Problem

The City of Fort Myers (Fla.) Wastewater Treatment Division includes two regional advanced wastewater treatment facilities, each with three 11 mgd carbon steel Internalift screw pumps. The pumps were approaching their 20-year life expectancy, were inefficient and needed replacing. The city wanted corrosion-resistant material and needed to continue operating during construction.

Solution

A turnkey proposal from the Davco team at **Evoqua Water Technologies** included six Internalift screw pumps, ancillary materials and construction. The pumps' closed design improves safety and confines odors and splashes while providing access for maintenance, prolonged bearing life and the ability to lubricate critical components while in operation.



RESULT

The city replaced the pumps under a single contract completed on time without site interruption. An 18-month schedule allowed both treatment plants to operate during construction. The corrosion-resistant materials are expected to extend screw pump life. **229/227-8734; www.evoqua.com.**

Center flow screens help plant increase flushable wipe capture

Problem

A wastewater treatment plant in New Orleans needed to protect downstream equipment by increasing screenings capture, including the screening of flushable wipes, but could not sacrifice flow capacity or increase headloss beyond the existing 1-inch-opening rake screens.

Solution

The utility selected **center flow screens** with 6 mm stainless steel laced links from **Hydro-Dyne Engineering**. Their center flow technology has a high screening capture ratio, and they capture a high volume of solids while minimizing headloss. Because the facility had tight overhead clearances, equipment was supplied modularly for easy installation and required no modifications to the channel.



RESULT

The screens increased the capture rate, with zero carryover, while maintaining high capacity and minimizing headloss. Each screen passes 60 mgd and captures the flushable wipes. Integral washing compactors deliver a clean and dewatered product for disposal. **813/818-0777; www.hydro-dyne.com.**

Biosolids dryer helps produce Class A product, increase treatment capacity

Problem

The Picnic Point Wastewater Treatment Facility in Edmonds, Wash., was reaching process capacity. Hauling and incinerating biosolids was difficult and expensive. The city wanted Class A biosolids to alleviate those concerns and be more environmentally conscious.

Solution

The facility implemented the **Veolia BioCon Dryer** from **Kruger USA** at its new activated sludge plant, which also uses membrane bioreactors. Dried biosolids can be used by a third party to fertilize farmland.



RESULT

With the dryer the plant doubled its treatment capacity, ensuring that the site can handle increased biosolids loads. It yields a lower volume of biosolids that are safely and easily handled. The solution was executed in a small footprint and yields a valuable end product. **919/677-8310; www.krugerusa.com.**

Fine screen system helps city reduce fouling

Problem

Since 1998, the City of Prince Albert, Saskatchewan, had relied on three Channel Monster units from JWC Environmental to capture and grind the

solids at the wastewater treatment plant headworks. In recent years, facing an increase in rags fouling equipment, officials decided to remove the rags and other inorganic solids before they entered the treatment system.

Solution

The city chose a **Fine Screen Monster** with StapleGuard ultra-high molecular weight (UHMW) panels coupled with a **Screenings Washer Monster** from **JWC Environmental**. The bacteria-resistant and self-lubricating UHMW panels are abrasion- and impact-resistant for durability and reduced maintenance. The panel construction eliminates the need for a rotating brush to clean off screenings.



RESULT

Since the installation in May 2014, the city has solved its ragging problem and improved process efficiency. Inorganic solids are removed, ground, washed and compacted by the Screenings Washer Monster, allowing the city to send dry, compacted solids to the landfill. **800/331-2277; www.jwce.com.**

Dosing system helps remove odor from potable water

Problem

United Utilities in Rochdale, United Kingdom, needed to add powdered activated carbon (PAC) to the water it drew from a reservoir. The PAC neutralized geosmin, an organic compound produced by microbes and algae that gave the untreated water a harmless but undesirable earthy taste and aroma.

Solution

A **dosing system** provided by **Spiroflow Systems Inc.** included a bulk bag discharger and a flexible screw conveyor to transfer PAC from the discharger up to a volumetric metering feeder with a buffer hopper above. From there, it is transferred to a second buffer hopper, which maintains a constant head of material above a venturi ejector. PAC is drawn under vacuum from the second buffer hopper and metered proportionately into a bypass water stream to form a slurry, which then re-enters and is mixed with the main water flow.



RESULT

Now free of the undesirable taste and smell, the PAC-treated water is distributed to homes and businesses in the area. **704/246-0900; www.spiroflowsystems.com.**

Centrifuges help plant increase cake solid percentage

Problem

The City of Flint, Mich., sought to maximize cake solids over the average 18 percent aging belt filter presses were producing with digested sludge.

Solution

The city and the state of Michigan partnered with BioWorks Energy to construct anaerobic digesters at the city's wastewater treatment plant. Two

DC20 horizontal solid-bowl centrifuges from **Noxon North America** were installed to replace a pair of belt filter presses. Each unit runs between 80 and 100 gpm, processing solids consisting of municipal sludge and food processing byproducts.



RESULT

The centrifuges provide cake solids concentrations in the 25- to 28-percent range. The extra dryness translates into disposal savings, which coupled with biogas-fueled energy production, puts the plant at net zero energy consumption. **416/843-6500; www.noxon.com.**

Wireless temperature monitoring system utilized to compost biosolids

Problem

One of the largest municipal compost facilities in North America, located in California, was having mass failures with its wireless temperature monitoring system due to the stainless steel stems corroding and the enclosures failing to keep corrosive gases out of the enclosure.

Solution

REOTEMP Instruments installed an **EcoProbe wireless temperature monitoring system** that included a nonmetal sheath to protect the stainless steel stem from corrosion. It has a triple seal to ensure that biosolids compost gases are kept out of the enclosure and cannot damage the internal electronics.



RESULT

Over five years after initial installation, the wireless probes continue to provide reliable temperature data in the harsh indoor compost environment. The customer is pleased with their performance and has recommended the system to multiple facilities in the years since. **800/648-7737; www.reotemp.com.**

Municipality installs dewatering system to produce Class A biosolids

Problem

The Immokalee Water and Sewer District, about 30 miles inland from Naples, Fla., operates a 4 mgd facility where biosolids were dewatered before being hauled to a landfill by a contract company at a cost of almost \$500,000 per year. The district sought a more efficient alternative.

Solution

The district selected **Schwing Bioset, Inc.** to dewater and produce Class A biosolids for use on a district-owned 300-acre farm. A screw press

dewaters the material to 20 percent solids. The material is then transferred through a piston pump into an alkaline stabilization reactor. Within an hour, Class A fertilizer is discharged to a spreader taken to the adjoining farm for daily land application. The automated system demands little operator interface.



RESULT

The district saves almost \$400,000 a year, achieving an expected payback at about five years. Beneficial use of the material offsets commercial fertilizer costs. **715/247-3433; www.schwingbioset.com.**

Smart-conveying pump lowers maintenance costs

Problem

The City of Hays, Kan., wastewater treatment facility needed to replace an old piston pump with new technology to convey primary biosolids and intermittently drain the primary clarifier's grease pit. The piston pump caused maintenance and housekeeping issues, had long lead times for replacement parts and would be excessively costly to replace.

Solution

The city installed a **BN 35-6LS progressive cavity pump** equipped with Smart Conveying Technology (SCT) from **SEEPEX Inc.** The SCT design splits the pump stator axially and integrates a retensioning device that when adjusted increases service life. It speeds up rotor and stator changing and allows removal of blockages and contaminants without dismantling piping.



RESULT

"We wanted to get away from various maintenance issues, primarily the mess the piston pump would make when packing wore out or when we used it for emptying the grease pit," says Roger Moerke, wastewater superintendent. "The SEEPEX pump came in under budget, performs both functions cleanly and empties the grease pit twice as quickly. We have yet to perform maintenance on the pump after it has been installed for three months, and we will be able to adjust the stator three times before a replacement stator is needed." **937/864-7150; www.seepeex.com.**

Increase in flow to plant requires upgraded grit removal

Problem

Plans called for closure of one of three wastewater treatment plants in the City of Baton Rouge, La., saving an estimated \$36 million a year in

operation and maintenance. The diversion of the flows from the closing plant required overhaul of the nearby South Wastewater Treatment Plant, and project leaders sought a more efficient screening and grit removal system able to handle capacities up to 205 mgd.

Solution

To achieve 95 percent grit removal, project leaders specified the **PISTA 360 hydraulic vortex grit removal system** from **Smith & Loveless, Inc.** The six grit chambers have a flat chamber floor, internal baffling and low-energy axial-flow propeller. The internal baffling directs the inlet flow into the chamber with a 360-degree rotation. In the outlet, it directs the flow out of the unit and acts as a slice weir to control water levels. No additional downstream flow control device is required to keep an acceptable velocity, even during low flow periods.



RESULT

The system went partially online in March 2013. Initial grit testing to evaluate grit removal performance demonstrated removal efficiency of 97.9 percent down to a 105-micron particle size. **800/898-9122; www.smithandloveless.com.**

Belt press helps village reduce biosolids disposal costs

Problem

The Village of Fort Simpson in Canada's Northwest Territories upgraded its sewage treatment facility to improve capacity and performance. The facility needed a dewatering technology suitable for processing solids produced from the new sequencing batch reactor plant. The northern location limited biosolids management options. Because a plant operator is not always on site, the dewatering process had to require minimal operator oversight.

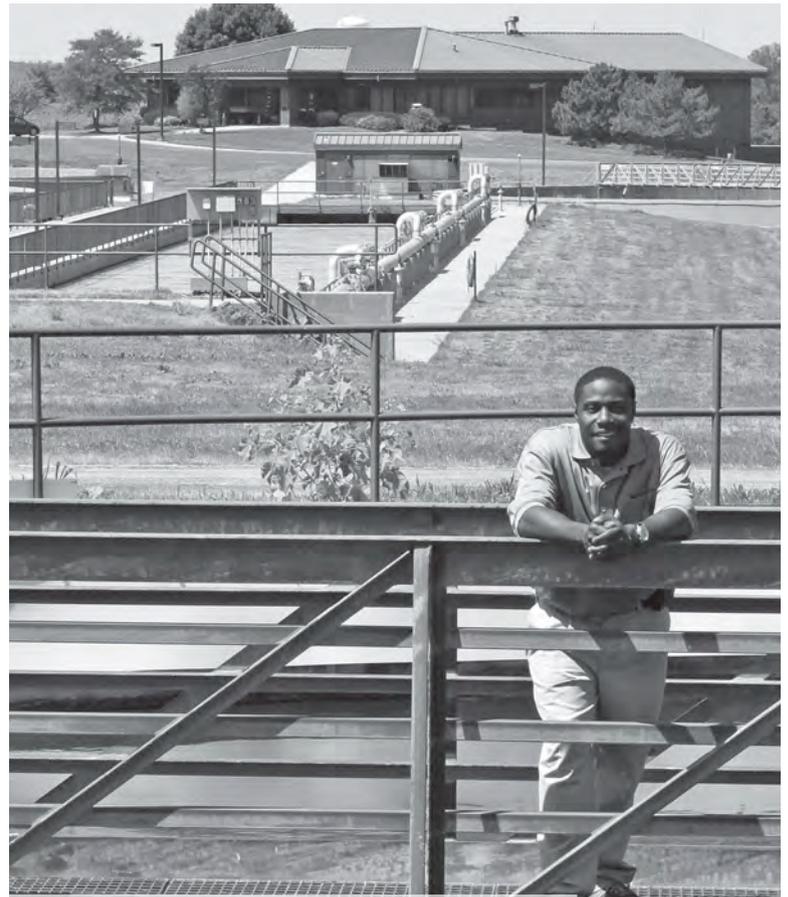
Solution

The village decided to install a **VFOLD INC. folding belt press** as a simple and economical dewatering method. A rotating drum thickener combined with Maxi-V folding belt press accepts slurry feed at 0.5 to 8 percent solids.



RESULT

Dewatering produces filter cake up to 18 percent solids for transport to a landfill. The equipment capital payback is forecast at 1 1/2 years. **877/818-3653; www.vfoldinc.com. tpo**



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Nate Tillis
Operations and maintenance supervisor
Beloit (Wis.) Water Pollution Control
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World Health Organization talk slated for WWETT Show

Since the Ebola virus outbreak in West Africa hit the headlines, many in the wastewater industry have asked about the potential for a variety of communicable diseases to spread through the pumping, transport and handling of septage and sludges containing human waste. Attendees at the 2015 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show will hear the latest information on the topic from a World Health Organization (WHO) official.

Dr. Adrianus Vlugman, WHO senior adviser on water, sanitation and environmental health, will speak Feb. 26 at 1 p.m. in Rooms 133-135 at the Indiana Convention Center as part of an extensive series of WWETT Show speakers and seminars. The talk on the transfer of communicable diseases is free and open to all attendees.

Vlugman will provide a general overview covering the survival and life expectancy of communicable diseases in water and wastewater. Among other topics, he will cover:

- Safety precautions to consider when handling water and wastewater in developing nations.
- The likelihood of communicable diseases to be spread or passed through both centralized wastewater plants and decentralized onsite wastewater systems.
- Whether there is a concern for the spread of communicable diseases through land application of properly treated sewage, biosolids or septage.

If you would like to attend the WHO program, fill out the online registration form at www.wwettshow.com/who.

Aquionics launches UV LED disinfection product site

Aquionics launched www.uvpearl.com, a dedicated site for Pearl UV-C LED disinfection products. The site offers product information on its UV-C LED mercury-free water disinfection system, UV transmittance monitor, collimator and air and surface disinfection system.

Mueller receives product award

Mueller Water Products received the 2014 Best Smart Water Product or Solution Award at the inaugural Smart Water Summit. Mueller received the award for its suite of Intelligent Water Technology solutions.

Dynamic names national sales manager

Dynamic Drive Source International, manufacturer of eddy current adjustable speed drives, brakes and controls, named Joseph Witts national sales manager for municipal and industrial water and wastewater sales.

Pure Technologies names regional VP

Pure Technologies named David Burke, P.E., vice president for its south-east region. Based in Pure's Columbia, Md., office, Burke will manage business development in the region and work with existing clients to develop pipeline management strategies.

GapVax opens Texas service center

GapVax opened a store and service center in Deer Park, Texas, offering equipment and parts sales, as well as routine module maintenance, water pump repair, hydraulic diagnostics and electrical repair. Equipment and parts include blowers, water pumps, gearboxes, vacuum tubing, hoses, hydraulic components and vacuum and high-pressure nozzles. John Dean, Gulf Coast sales representative, will manage the location.

Advanced Drainage Systems opens distribution yard

Advanced Drainage Systems opened a stocking/distribution yard in Alviso, Calif. The facility is the third California location for ADS.

BASF names national distributor for water solutions portfolio

BASF Canada and Canada Colors and Chemicals (CCC) entered into an agreement for the exclusive distribution of BASF's water solutions portfolio throughout Canada. **tpo**

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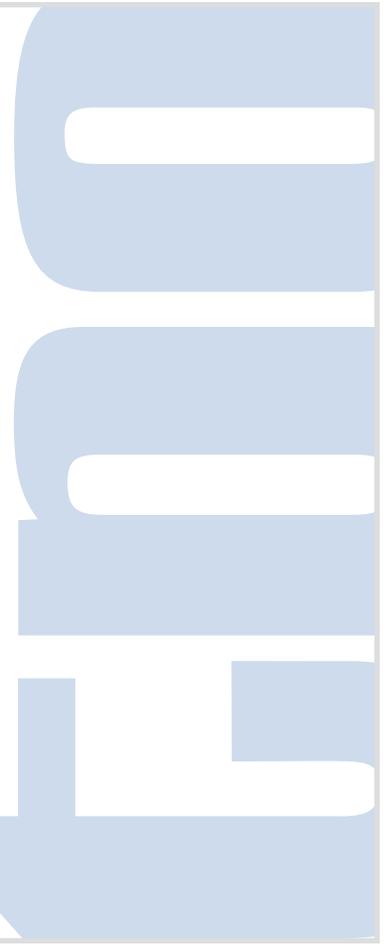
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1. BENTEK REMOTE ASSET MONITORING SYSTEM

The SAT110 portable RTU alarm dialer from Bentek Systems features a built-in battery, vibration sensor, I/O, magnetic mount and CID2 hazardous location certification that can be deployed for monitoring the run/no run condition of compressors and generators. Integral GPS enables location tracking of remote assets, including generators, compressors, tanks, skids and buildings. The system can be interfaced to an existing SCADA host or via smartphones and Web browsers through the SatSCADA server. **403/243-5135; www.scadalink.com.**

2. SENSORAY EIGHT-CHANNEL FRAME GRABBER

The Model 1012, eight-channel mini PCI-Express frame grabber from Sensoray, designed for video surveillance, simultaneously captures eight channels of NTSC/PAL video and eight channels of optional monoaudio. Each video channel captures at full frame rate 30 feet per second (NTSC) or 25 feet per second (PAL). **503/684-8005; www.sensoray.com.**

3. ASSMANN 8,850-GALLON DOUBLE-WALL TANK

The IMT 8850 double-wall storage tank from Assmann Corporation of America is designed to hold 8,850 gallons of liquid. The tank has a 24-inch hinged manway and secure secondary containment for 110 percent capacity. **888/357-3181; www.assmann-usa.com.**

4. COLE-PARMER WATERPROOF DO AND PH METERS

Oakton waterproof DO 450 and pH/DO 450 optical meters from Cole-Parmer have no membrane or electrolyte to replace, no incoming flow requirement and no hydrogen sulfide interference. The meters also feature short response time, minimal drift and minimal maintenance. Up to 500 data sets can be stored and downloaded with USB or RS-232 cable. The DO 450 meter has manual barometric pressure and salinity corrections. The pH/DO meter offers six-point calibration. **800/323-4340; www.coleparmer.com.**

5. EATON TELESCOPING LIGHT POLE

The Crouse-Hinds V-Spring telescoping light pole from Eaton has a spring assist to offset the weight of the pole and light, enabling a worker to safely lower or raise the fixture. The pole is fully adjustable from 5 to 10 feet and travels vertically. It can be locked into any height position with pins or tethers. A 2-inch base is standard on all models. **866/764-5454; www.crouse-hinds.com.**

6. MELTRIC DSN150 SWITCH-RATED PLUG, RECEPTACLE

The DSN150 Series switch-rated plug and receptacle from Meltric Corporation connects large motors or other high amperage devices. Features include solid silver-nickel contact material, spring-loaded, butt-style contact technology, Type 4X, IP66 + IP67 environmental protection, lightweight design, six auxiliary contacts and UL/CSA ratings. **800/433-7642; www.meltric.com.**

7. AIRMASTER TURBO X-TREME WATER CANNON

The Turbo X-Treme Magnum water cannon from Airmaster Aerator has a 50 hp floating/surface aerator that can pump up to 12.5 million gpd. Powered by a 7.6 hp grinder pump, the water cannon rotates 360 degrees in 1 minute 35 seconds, spraying 100 gpm in a 230-foot diameter. **888/813-3680; www.airmasteraerator.com.**

8. CHROMALOX EXPLOSION-PROOF BLOWER HEATER

The CXH-XD blower heater from Chromalox withstands corrosive and wet environments. ATEX certified, it has a corrosion-resistant coated heat exchanger and optional 316 stainless steel and epoxy-coated frames. **800/443-2640; www.chromalox.com.**

9. SEE WATER PUMP CONTROL, ALARM PANELS

SIM-A pump control and alarm panels from See Water Inc. warn of high liquid levels and control 120/208/240V single-phase or 208/240/480V



three-phase pumps in dewatering, sewerage and wastewater applications. The simplex panels include integrated electronic pump control and alarm circuitry, IEC motor contactor and three floats: pump on, pump off and high-liquid alarm. **888/733-9283; www.seewaterinc.com.**

10. CLEARSPAN FABRIC BUILDING OPTIONS

HD Buildings from ClearSpan Fabric Structures are available in gable- and round-style designs and can be mounted as a freestanding structure or affixed to other foundations, such as ponywalls or containers. The frames are made from triple-galvanized structural steel tubing with a 12.5-ounce, high-density polyethylene rip-stop fabric cover. Buildings start at 25 feet wide. New lengths include 160, 180 and 200 feet. **866/643-1010; www.clearspan.com.**

11. KOHLER 24 KW STANDBY GENERATOR

The 24RCL 24 kW standby generator from Kohler Power Systems has a 1,800 rpm, 2.2 liter in-line four-cylinder engine and delivers 60 Hz single-phase and 60 Hz three-phase (208, 240 and 480 volt) running on natural gas or LP. **800/544-2444; www.kohlerpower.com.**

12. WAGO SIGNAL CONDITIONERS

The 2857 Series signal conditioners from WAGO Corp. provide conversion, isolation and transmission of different signal types for automation and process control applications. It can be configured via DIP switch, software, JUMPFLEX-To-Go app or an optional plug-in LCD display. **800/346-7245; www.wago.us.**

(continued)

wastewater: product spotlight

Grit dewatering, washing system designed for smaller treatment plants

By Ed Wodalski

The **SpiraSnail screw-type grit dewatering system** from **Hydro International**, designed to work in combination with the GritCup washing system, achieves 95 percent removal of grit 106 microns and larger and 70 to 75 percent removal of 75 to 106 micron particles, helping reduce grit deposition and abrasive wear in downstream processes.

Applications include new wastewater treatment plants, treatment plant retrofits with a peak capacity of 10 mgd, or as a replacement for worn or ineffective grit treatment systems.

“The GritCup and SpiraSnail system has been specifically developed as a joint solution to grit washing and dewatering,” says Adam Neumayer, operations director, Hydro International U.S. Wastewater Division. “Many smaller- and medium-sized treatment plants have struggled with the cost of grit-related maintenance from abrasive wear and deposition of grit.”

Conventional washing and dewatering systems can lose fine grit particles, sending them back to the process, and contain large volumes of organics that increase the weight and volume of material to be disposed. The organics retain water and decompose, creating odors.

“The GritCup and SpiraSnail system produces few volatile solids, so odors are reduced,” he says.

Optimized for intermittent operation to reduce energy usage, the GritCup features large internal clearances and internal volumes, reducing the risk of plugging from solids and wet-weather grit volumes. In the SpiraSnail, grit slurry enters the conically shaped clarifier tangentially and under



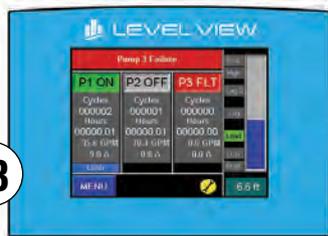
SpiraSnail screw-type grit dewatering system from Hydro International

a baffle, preventing exposure to the clarified effluent exiting over the perimeter weir. Grit follows a predetermined path to the slowly turning screw, reducing the risk of becoming resuspended and discharged.

Grit from the collection device is fed tangentially into the GritCup at a rate of 200 gpm. High-energy vortex separation forces larger particles to the perimeter of the GritCup while smaller grit particles and nonorganic matter remain suspended before settling into the boundary layer at the bottom of the unit and swept to the center for collection. Collected solids are discharged via a tangential underflow pipe.

Solids are dewatered by the rotating (2 rpm) Archimedes screw as it moves toward discharge. Clarified water is returned to the treatment plant. The combined system does not require washwater.

“Both parts of the system have very low maintenance, which is achieved mainly via visual inspection,” Neumayer says. **866/615-8130; www.hydro-int.com.**



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13. PRIMEX LEVEL VIEW CONTROLLER

The Level View controller from PRIMEX is designed to control two or three constant- or variable-speed pumps for pump up (water) and pump down (wastewater) applications. The color touch screen provides on/off level control, speed control, pump alternation, flow monitoring, data logging, alarm logging and historical trending. An SD card provides for data storage and download. Connectivity options provide flexibility for SCADA/BAC integration as well as a plug-and-play interface to the Pump Watch Web-based monitoring system. **844/477-4639; www.primexcontrols.com.**

14. YSI CONTINUOUS MONITORING AND CONTROL SYSTEM

The IQ SensorNet continuous monitoring and control system from YSI, a Xylem brand, enables a wastewater treatment plant to monitor every aspect of the process, from pre-sedimentation to biological tanks to effluent. A single module can link up to 20 sensors measuring different parameters, from dissolved oxygen and pH to ammonium, turbidity and temperature. **800/765-4974; www.ysi.com.**

15. ULTRA ELECTRONICS MULTINODE MULTIPLEXER

The EOtec 2000 multinode MX multiplexer from Ultra Electronics is designed to transmit up to 16 1024 input channels and unlimited output channels of bidirectional electrical information over a pair of fiber optic cables. The multiplexer base module provides input/output sections that include 4-20 mA, 0-10 Vdc and contact closure. It connects directly to the fiber optic cable via small form-factor pluggable transceivers and provides visual indicators for power, global alarm and module status, as well as fiber link status. **800/880-9333; www.ultra-nspi.com. tpo**

water: product spotlight

Sodium hypochlorite generator produces chlorine on demand

By Ed Wodalski

The **Scienco SciCHLOR sodium hypochlorite generator with SciCELL technology** from **Bio-Microbics** produces chlorine on demand using salt, water and electricity.

Designed to replace liquid chlorine deliveries and chlorine gas tank storage in most water treatment applications, the generator produces a strong oxidizing solution that kills *Staphylococcus aureus* and *Escherichia coli* organisms as well as other harmful pathogens.

“The SciCHLOR system was designed with a small, simple electrolytic cell,” says Bob Rebori, president, Bio-Microbics. “Every four hours as the water is circulated back through the cell, sodium hypochlorite is manufactured using low pressure and a small amount of electricity. At the same time, water passing through the cell actually cleans it while converting the brine into sodium hypochlorite, liquid chlorine.”

The SciCHLOR system includes integral brine tanks, chlorine storage tanks, control panel, multipass SciCELL unit and recirculation pump that enables the system to automatically run at optimum salinity. Operating modes include batch, continuous, clean, setup and diagnostic.

Connected to an incoming water source (55 to 85 degrees F), the system creates 2 to 13 percent salinity (8 percent optimum brine) in about five hours. As chlorine is used, water automatically refills the brine tank. If no solution is used the system shuts down to save power.

Available in four sizes, the SciCHLOR unit produces 10, 20, 40 or 60 pounds of 0.8 percent strength sodium hypochlorite solution per day. Sodium hypochlorite is a stable disinfectant, easily fed into water and wastewater treatment processes, among other disinfecting applications.

The 10-pound unit produces about 150 gallons of solution at 8,000 ppm for treating between 800,000 and 900,000 gallons of water per day at 1.5 ppm. Both the 10- and 20-pound units have a footprint of 64 inches by 26 inches by 56 inches. A 500-pound custom module is available.

“You can install the machines in such a way that once a week you load them with salt, flip the switch, create the chlorine and pump from the reservoir as needed,” Rebori says.

Maintenance includes a weekly or biweekly washdown using 1 gallon of Mighty Mike industrial descaler to keep the electrolytic cell operating at optimal efficiency.

Options include chemical feed pump to deliver the solution, solenoid valve to drain the product tank and lockout to stop the system when a water softener is in regeneration mode.

800/753-3278; www.sciencofast.com.



Scienco SciCHLOR sodium hypochlorite generator from Bio-Microbics

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- 3. Assmann Corporation of America IMT 8850 storage tank
- 4. Cole-Parmer Oakton DO 450 and pH/DO 450 optical meters
- 5. Eaton Crouse-Hinds V-Spring telescoping light pole
- 6. Meltric Corporation DSN150 Series plug and receptacle
- 7. Airmaster Aerator Turbo X-Treme Magnum water cannon
- 8. Chromalox CXH-XD blower heater
- 9. See Water Inc. SIM-A pump control and alarm panels
- 10. ClearSpan Fabric Structures HD Buildings
- 11. Kohler Power Systems 24RCL standby generator
- 12. WAGO Corp. 2857 Series signal conditioners
- 13. PRIMEX Level View controller
- 14. YSI, a Xylem brand, IQ SensorNet monitoring/control system
- 15. Ultra Electronics EOTec 2000 multinode MX multiplexer
- Hydro International SpiraSnail grit dewatering system
- Bio-Microbics Scienco SciCHLOR sodium hypochlorite generator

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POSITIONS AVAILABLE

Hillsborough County Public Utilities - Plant Manager \$63,419 - \$98,030/year www.hccsb.org - Job Opportunities for more information and to apply. Or http://www.jobaps.com/Hillsborough/sup/BulPreview.asp?R1=1412&R2=PLTMGRPUNU&R3=001&Viewer=Admin&Test=Y (o02)

POSITIONS AVAILABLE

The City of Pierre is accepting qualified applications for the Wastewater Treatment Plant Superintendent position. The Superintendent is responsible for directing & supervising the operation, maintenance & repair of the wastewater treatment facilities and lift stations and is responsible for meeting South Dakota DENR and EPA rules & regulations and for compliance monitoring. Must possess a valid Wastewater Treatment Class IV Certificate issued by South Dakota DENR or obtain certification within 1 year. Salary up to \$71,000 and is FLSA Exempt. The capital city of Pierre is a premier destination for outdoor recreation and was recently highlighted as the Nation's Second Best Capital City to live in and the best community to live in South Dakota. Job description and application available at: City of Pierre, Attn: Human Resources, 222 East Dakota, PO Box 1253, Pierre, South Dakota, 57501. E-mail: laurie.gronlund@ci.pierre.sd.us. Application and job description available online at www.cityofpierre.org. Open until filled. (o02)

"Our vital water **conservation** program will have a lasting positive impact on our community, providing our city with safe water, significant cost savings and a reduced carbon footprint."

Chuck Gray
 Water Superintendent
 Mount Vernon (Ind.) Water Works



Read what **matters** to operators in every issue of **TPO**.

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people/awards

Kelly Zimmer of Rock Springs was elected president of the Wisconsin Wastewater Operators Association. Zimmer manages drinking water and wastewater operations at several facilities in south-central Wisconsin for MSA Professional Services.

Laura Wilson was hired as the utilities director for the City of Midland, Texas.

Josh Willison, a wastewater operator for Alliance Water Resources in Villa Ridge, received the Young Professional of the Year Award from the Missouri Water and Wastewater Conference.

Stephen Sanders was hired as the director and head trainer of the Environmental Training Center at Morrisville State College in New York. He is responsible for daily operations and classroom instruction.

Tom Spain, director of the Water Reclamation Facility in Henderson, received an Exceptional Service Award from the North Carolina American Water Works Association-Water Environment Association.

Rachel Ellis was named executive director and **Brian Gresehover** was named chairman of the Chesapeake Section, AWWA.

El Paso (Texas) Water Utilities received the Sustainable Water Utility Management Award from the Association of Metropolitan Water Agencies.

Colorado Springs Utilities won the 2014 WaterSense Partner of the Year Award from the U.S. EPA for its commitment to water efficiency and efforts to educate Americans about WaterSense during 2013.

Mike Thralls, recently retired Oklahoma Conservation Commission executive director, received the Oklahoma Water Pioneer Award for significant contributions in the planning, development, management and conservation of the state's water resources.

The Muskogee (Okla.) Water Treatment Plant received a Water Fluoridation Quality Award from the U.S. Centers for Disease Control and Prevention.

The **Thomasville Utilities Water Construction Team** received the Lester E. Feathers Damage Prevention Award from the Georgia Utilities Coordinating Council.

TPO welcomes your contributions 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 Rural Water Association is offering a Collection System Rehab Options course Feb. 18 in Jasper. Visit <http://alruralwater.com/ceh/index.asp>.

Arkansas

The Arkansas Environmental Training Academy is offering these courses:

- Feb. 2-4 – Basic Water Treatment, Blytheville

- Feb. 10 – Basic Water Math, Jonesboro
 - Feb. 11 – Applied Water Math, Jonesboro
 - Feb. 12 – PWS Compliance, Jonesboro
 - Feb. 17-19 – Basic Water Distribution, Blytheville
 - Feb. 24-26 – Intermediate Water Treatment, Lowell
- Visit www.sautech.edu/aeta/.

Colorado

The Rocky Mountain Water Environment Association (RMWEA) is offering a Supervisor Certificate Program course Feb. 12 in Parker. Visit www.rmwea.org.

Florida

The Florida Water Environment Association Air Quality Committee will hold an Air Quality Workshop Feb. 12 at the Thomas P. Smith Water Reclamation Facility in Tallahassee. Contact Larry Hickey at Larry.Hickey@equipmentplusinc.com or visit http://www.fwea.org/air_quality_committee.php.

Illinois

The Illinois Section of AWWA is offering these following courses:

- Feb. 2 – Manage for Success: Effective Utility Leadership Practices, Rockford
 - Feb. 5 – Wastewater Microscopy, Libertyville
 - Feb. 10 – Water/Sewer Plans 101, Mt. Prospect
- Visit www.isawwa.org.

Kansas

The Kansas Water Environment Association is offering these courses:

- Feb. 3-4 – Lift Stations, Pomona
 - Feb. 4 – Wastewater Reclamation and Reuse, Phillipsburg
 - Feb. 6 – Introduction to Water and Wastewater Conveyance, Ulysses
 - Feb. 17-18 – Lift Stations, Arkansas City
 - Feb. 18-19 – Math for Operators, Pittsburg
 - Feb. 20 – Applied Math for Wastewater Operators, Dodge City
 - Feb. 25-26 – Wastewater Collection Systems, Johnson City
 - Feb. 27 – Small Wastewater Systems, Hays
- Visit www.kwea.net.

New Jersey

The New Jersey Agricultural Experiment Station Office of Continuing Professional Education is offering these courses in New Brunswick:

- Feb. 3 – Basic Electrical Print Reading
 - Feb. 5 – Safe Drinking Water Act Regulatory Update
 - Feb. 11 – Introduction to Hydraulics
 - Feb. 25 – Math Refresher for Water and Wastewater Operations
 - Feb. 26-27 – Ladder Logic: Water/Wastewater Electrical Training
- Visit www.cpe.rutgers.edu.

Oklahoma

Accurate Environmental in Oklahoma is offering these courses:

- Feb. 3-5 – D Water and Wastewater, Stillwater
 - Feb. 6 – Open Exam Session, Tulsa
 - Feb. 9 – General Refresher for Water Operators, Stillwater
 - Feb. 9-10 – C Water Operator, Stillwater
 - Feb. 11 – General Refresher for Wastewater Operators, Tulsa
 - Feb. 11-12 – C Wastewater Operator, Tulsa
 - Feb. 13 – Open Exam Session, Stillwater
 - Feb. 17-19 – D Water and Wastewater Operator, Tulsa
 - Feb. 23-26 – A/B Wastewater Operator, Stillwater
- Visit www accuratelabs.com/classschedule.php.

Michigan

The Michigan Water Environment Association is offering an operators seminar Feb. 3-4 in Lansing. Call 517/641-7377 or visit www.mi-wea.org.

events

Feb. 2-4

New York Water Environment Association Annual Meeting and Exhibition, New York Marriott Marquis. Call 877/556-9932 or visit www.nywea.org.

Feb. 3-4

Michigan Section of AWWA/MWEA Joint Expo, Lansing Center. Visit www.mi-water.org.

Feb. 3-5

2015 Pacific Water Conference, Hawaii Convention Center, Honolulu. Visit www.awwa.org.

Feb. 3-5

AWWA/Hawaii Water Environment Association Annual Joint Conference, Hawaii Convention Center, Honolulu. Call 808/768-7236 or 808/748-5731.

Feb. 17-19

Illinois Rural Water Association Annual Technical Conference, Effingham. Visit www.ilrwa.org.

Feb. 17-20

American Water Works Association (AWWA) 2015 Utility Management Conference, Austin, Texas. Visit www.awwa.org.

Feb. 17-20

AWWA/WEF 2015 Utility Management Conference, Hyatt Regency Austin, Texas. Visit www.wef.org/conferences.

Feb. 23-25

Illinois Water Environment Association Annual Conference and Exposition, iHotel & Conference Center, Champaign. Call 630/391-2169 or visit www.iweasite.org.

Feb. 23-26

Water & Wastewater Equipment, Treatment & Transport Show, Indiana Convention Center, Indianapolis. Call 800/257-7222 or visit www.wwett.com.

Feb. 23-27

Rural Water Association of Utah Annual Conference, Dixie Center, St. George. Call 801/756-5123.

Texas

The Texas Water Utilities Association is offering these following courses:

- Feb. 3-5 – Far West Texas Regional School, Fort Stockton
- Feb. 10 – Activated Sludge, Lindale
- Feb. 17 – Safety, Carrollton

Visit www.twua.org.

Wisconsin

The Wisconsin Department of Natural Resources is offering these courses:

- Feb. 2 – General Wastewater Treatment, Chippewa Falls
- Feb. 2 – Programmable Logic Controls, Level 1, Milwaukee
- Feb. 3 – Groundwater Supply and Distribution Certification, Madison
- Feb. 10 – Phosphorus Removal, Introduction and Advanced, Madison
- Feb. 17 – Activated Sludge, Introduction and Advanced, Green Bay
- Feb. 17 – Iron, Zeolite and VOC Certification, West Bend
- Feb. 23 – General Wastewater Treatment, Madison
- Feb. 24 – Groundwater Supply and Distribution Certification, Green Bay

Visit www.dnr.wi.gov.

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The University of Wisconsin Department of Engineering Professional Development is offering an Instrumentation and Control for Water and Wastewater Processes course Feb. 23-25 in Madison. Visit www.epdweb.engr.wisc.edu.

The University of Wisconsin-Milwaukee School of Continuing Education is offering a Sustainable Water Management course Feb. 12 in Milwaukee. Visit www.uwm.edu.

The Wisconsin Rural Water Association is offering these courses:

- Feb. 5 – Winter Operations, Horicon
- Feb. 11 – Sanitary Surveys/Capacity Development, Richland Center
- Feb. 11 – Sanitary Surveys/Capacity Development, Oconomowoc
- Feb. 12 – Sanitary Surveys/Capacity Development, Plover

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