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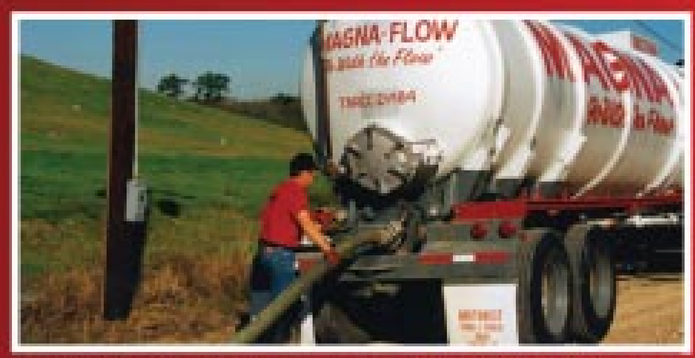

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JANUARY 2011

tpo TREATMENT PLANT OPERATOR

DEDICATED TO MUNICIPAL WASTEWATER PROFESSIONALS

Published monthly by:

COLEpublishing

1720 Maple Lake Dam Rd., PO Box 220
Three Lakes WI 54562

www.tpomag.com

In U.S. or Canada call toll free 800-257-7222
Elsewhere call 715-546-3346
E-mail: info@tpomag.com
Web site: www.tpomag.com
Fax: 715-546-3786

Office hours Mon.-Fri., 7:30 a.m.-5 p.m. CST

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ADVERTISING RATES: Call 800-994-7990 and ask for Phil or Kim. Publisher reserves the right to reject advertising which in its opinion is misleading, unfair or incompatible with the character of the publication.

EDITORIAL CORRESPONDENCE: Address all editorial correspondence to Editor, *TPO*, P.O. Box 220, Three Lakes, WI, 54562 or e-mail editor@tpomag.com.

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

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on the cover

Wastewater superintendent Kevin King and the staff at the Henry N. Wochholz Regional Water Recycling Facility in Yucaipa, Calif., have made numerous improvements in the process to meet tightening discharge requirements and to prepare for total water recycling in the near future. (Photography by Natan Vigna)

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In Case of the Unthinkable

HURRICANE. FLOOD. FIRE. POWER FAILURE. BAD THINGS NOT ONLY CAN HAPPEN. THEY ALMOST CERTAINLY WILL. HOW WELL ARE YOU PREPARED FOR AN EMERGENCY?

By Ted J. Rulseh, Editor

This month's "In My Words" column tells how two Rhode Island wastewater treatment plants handled the aftermath of unprecedented floods that left them underwater.

Both plants survived admirably from emergencies of a size they could hardly imagine, let alone prepare for. And surely, in a year of floods such as 2010, they weren't the only treatment plants that took on water.

Their experience should raise a question in any treatment plant manager or operator's mind: What if something like that happened here? It wouldn't have to be a flood. It could be a tornado. A fire. A massive and long-lasting utility power outage.

The funny thing about disasters is that sooner or later, on some scale or other, they happen. And how well you survive and thrive afterward depends heavily on how well you prepare.

MAKING THE TIME

Disaster planning isn't fun, especially when it takes time that already is in short supply. It's easy, consciously or not, to adopt that attitude that "It won't happen here," at least for, say, the next six months or a year. So why not procrastinate a little longer?

Well, ask those folks in Rhode Island. Their experience argues for planning for everything including a worst-case scenario. Now, treatment plants, being absolutely critical facilities, by nature have contingency plans in place and redundancy built in.

They are prepared, for example, for big spikes in flow. They have backups for the most critical equipment. But even extremely well run plants can have chinks in their emergency planning armor. Consider

Disaster planning isn't fun ... It's easy, consciously or not, to adopt that attitude that "It won't happen here," at least for, say, the next six months or a year. So why not procrastinate a little longer? Well, ask those folks in Rhode Island.

West Warwick, R.I., plant superintendent Peter Eldridge learned from the flood the importance of keeping vital records in high-and-dry areas, or storing it off-site.

In Warwick, executive director of Warwick Sewer Authority Janine Burke discovered the wisdom of placing SCADA servers and other critical computer equipment on the second floor (if available). If it took a flood to teach these excellent operations such basic lessons, what vulnerabilities exist at other treatment plants around the country?

THE PEOPLE SIDE

Quite often, a basic flaw in an emergency plan (at a treatment plant or any other facility) lies not in lack of equipment or technology but in lack of organization: whom to contact, and how, in case of this or that emergency.

Take electric power, without which, of course, a treatment plant is disabled. Plants by law have substantial backup generating capacity, in case utility power goes down. But what if the backup generation fails, because it's flooded, because its maintenance has been neglected, or for any other reason?

The plant has no power. What now? Who is responsible? Where do you call? Assuming a temporary unit can be delivered, where should it be installed? Is there easy access to the necessary connection points? How big a unit is needed to run all the essential loads? Are multiple units needed to handle localized loads? Who will operate the temporary equipment?

More fundamentally, which staff members are in charge of making everything happen? If they are not on site at the onset of the emergency, how can they be reached? Is there a list somewhere of specific responsibilities, home phone numbers, cell phone numbers, pager numbers, e-mail addresses?

To prepare yourself for loss of power, you should have an established relationship with a rental generator dealer (as Eldridge did in West Warwick, and as Warwick's engineering firm did). If you have a connection with a dealer, then you know at once where to call, and the dealer probably knows roughly what you need, and either has it in stock or can get it quickly.

Remember, emergencies often cover a wide area and create vast and sudden demand for temporary equipment. Do you want to be in the middle of a disaster, going through the Yellow Pages, calling generator rental houses that are already swamped with orders, standing in line behind school systems, hospitals and factories that have worked with those dealers on emergency plans?

PART OF THE COMMUNITY

Electric power is just one example. The past "year of floods" should be a wake-up call to pull out your emergency plan and revisit it from front to back. Even if it's a good plan, you can almost surely make it better. And the Rhode Island experience may cause you to think a little harder in defining the true worst-case scenario.

One item Burke mentioned among her "lessons learned" deserves special emphasis: Your organization should be well represented on your community's emergency planning committee. In disaster planning, most of the attention seems to go to police, fire, rescue, public works and hospitals. Yet wastewater treatment is just as important. Your facility and your staff should have a role in planning.

So, as you dust off your emergency plan, you may also want to offer your services to help plan for the impact of a disaster on the community that surrounds you.

If you have stories or best practices on emergency planning to share, please let us know about them, so that we can share them with your peers in the industry. Send a note to editor@tpomag.com. I promise to respond, and we'll report on excellent examples on the pages of *TPO*.

Here's wishing you never have to deal with a disaster, but that if you have to, you will be ready. **tpo**

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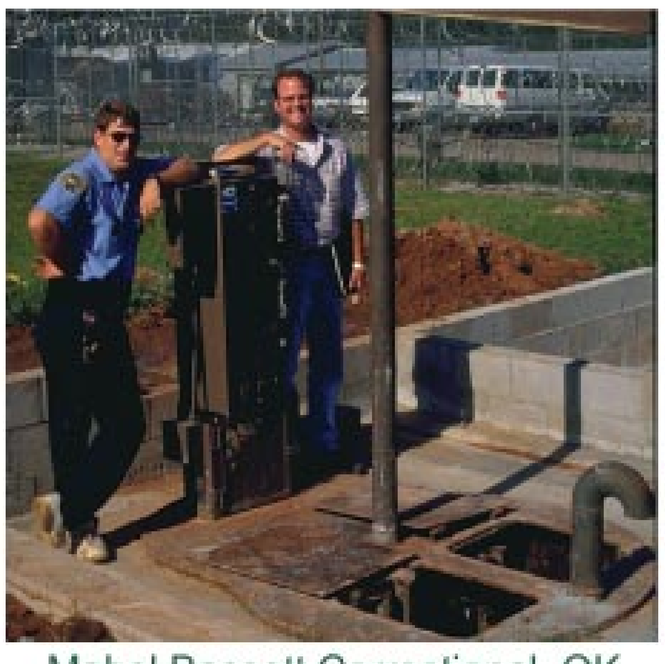
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School Year-Round

GRANTS HELP A LOUISIANA TREATMENT PLANT HOST KIDS OF ALL AGES FOR HANDS-ON EDUCATIONAL EXPERIENCES — INCLUDING SUMMER CAMPS

By Diane Gow McDilda

PHOTOS COURTESY OF JAN MISTICH

Field representative Cliff Siverd gives tours to fifth-grade students on a field trip from Tchefuncte Middle School in Mandeville, LA. He tells all the groups about the biological treatment process and guides them through water-quality testing of the receiving waters.

Jan Mistich is on double duty. She's a full-time fifth-grade science teacher at Tchefuncte Middle School in Mandeville, La., while also serving as educational director for the Public Works Department's environmental interpretive program.

The program includes a variety of field trips to the Mandeville Wastewater Treatment Plant tailored to children from grades 2-12. And a summer program blends environmental education with fun. The program is run with support from the plant staff.

WHERE THERE'S A WILL

In 2002, Mistich's brother-in-law, Joe Mistich, then public works director, secured a five-year grant to set up a classroom, prepare lesson plans, and pay an educator to direct an environmental education program. Since then, two more grants have kept the project going.

"I used to come here and bring my students," says Jan Mistich. "And Joe would do the presentation. When the grant came through, he asked me to write up lesson plans." She left teaching for a year to work on the lesson plans. Connie Marciante now works as teacher educator at the plant, while Mistich manages the program.

Generally, field trips to the plant include a two-hour tour and a mix of discussion, hands-on work and video instruction. Students learn about the biological treatment process, including a lab presentation from a treatment plant operator. They also visit the constructed wetlands the plant uses for polishing the effluent before discharge about two miles south of Lake Pontchartrain.

From the dock, students collect samples from the wetlands and test them for parameters such as dissolved oxygen, pH and turbidity. Then it's time for an onsite lunch break. "We usually have about 60 kids here — 30 inside and 30 outside," says Jan Mistich.

Teacher educator Connie Marciante investigates water bugs from the swamp with fifth-graders from Tchefuncte Middle School.

CLEANING THE WATER

After lunch, the trip continues with laboratory work at the plant classroom. There are several activities, but the most popular is making and cleaning wastewater. Students are guided through rooms of a virtual house where everyday products like shampoo, soap, toothpaste, dirt, oil, food scraps, and mock human waste are added to their water samples.

"We talk about why we wouldn't want to release the wastewater that they've made into the environment, and they are reminded of the wetland we just visited and the impact it would have," says Mistich.

A video describes mechanical processes for treating wastewater and comparisons are made between the plant in the video and Mandeville's treatment plant. And then stu-

What's Your Story?

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

"We talk about why we wouldn't want to release the wastewater that they've made into the environment, and they are reminded of the wetland we just visited and the impact it would have."

JAN MISTICH

Treatment plant operator James Guillory explains the testing procedures he does every day to kids at a summer camp.

A group of teachers from the National Science Teachers Association tour the treatment plant. The tour director was Mandeville public works director David DeGeneres.

dents are challenged to clean their own wastewater samples using sieves, cheesecloth, paper towels, cotton batting, sand, gravel and charcoal.

Other topics include groundwater and surface water, wetlands, macroinvertebrates, and soil as a cleaning medium. The kids also learn about the water bugs and wading birds that call the treatment plant home. "We were awarded the grant in February of 2003, and then we had fall to get ready and spring to start," says Mistich. "Since then we've had about 10,000 kids."

OTHER FUN

Outside the school year, the program also offers a Water Wonders summer camp — three one-week camps for students entering grades 4-6. The camp isn't all science, but many activities involve nature surrounding the plant. Campers go fishing and take a hike where they learn about the quality of the lake water and the wildlife of the lake and marsh. In 2010, the camp included learning about the oil spill in the Gulf of Mexico, turning a tragedy into a teachable opportunity.

The program held a Watershed Festival last fall that included hands-on activities, Enviroscape demonstrations, and fish and wildlife presentations from state Department of Environmental Quality staff. The festival was part of Keep Mandeville Beautiful, a day where volunteers clean up the litter along Mandeville waterways.

"After the volunteers finish with the cleanup, they can come back to the lake for the environmental fair," Mistich says. The Mandeville Public Works Department is making sure that environmental education is intertwined with the community. tpo

Worth the Wait

AN UPGRADE TO A WISCONSIN TREATMENT PLANT MEANS ENERGY SAVINGS AND MORE OPPORTUNITIES FOR BENEFICIAL USE OF DIGESTER METHANE

By Doug Day

A 16,000-cubic-foot Dystor methane storage tank from Siemens Water Technologies is part of the upgrade to the Two Rivers Wastewater Treatment Plant. (Photography by Doug Day)

Eighty-year-old aeration basins, 30-year-old equipment, no methane production from the digesters. The City of Two Rivers, Wis., had many reasons to upgrade its wastewater treatment plant.

Planning by Donohue & Associates Inc. started in 2006 to upgrade the aeration basins, install two new digesters, add a SCADA system, and use methane as fuel. It all turned into an award-winning design, receiving the State Finalist Engineering Excellence Award from the American Council of Engineering Companies of Wisconsin. The project's general contractor was J.F. Ahern Company.

The rebuilt aeration basins at the Two Rivers treatment plant include automatic dissolved oxygen control.

Two Rivers Wastewater Treatment Plant
COSTS BEFORE AND AFTER PLANT UPGRADE

	ELECTRICITY/NATURAL GAS	BIOSOLIDS HAULING	POLYMER TREATMENT
2006	$157,843	$25,987	$60,800
2007	$160,243	$23,992	$51,238
2008	$159,620	$26,922	$76,254
After Upgrade			
2009	$154,254	$12,652	$43,276

2009 figures include 12% increase in treatment volume and avoidance of 7,500 cubic feet of natural gas per day to heat digesters

The upgraded plant, with 2.3 mgd average flow, is saving $20,000 a year in electricity and natural gas, $30,000 in chemicals, and 50 percent in biosolids hauling.

GREAT TIMING

As it turned out, the timing for the upgrade couldn't have been better for this city of 13,000 on Lake Michigan. As the city was considering the upgrade, the Village of Mishicot, six miles north, inquired about getting sewer service.

"They were facing a major upgrade to their system because they couldn't meet the phosphorous and nitrogen requirements," says Larry Lambries, the Two Rivers plant superintendent. The village was faced with replacing its treatment lagoons with a mechanical treatment plant.

The Two Rivers upgrade project started in late 2007 and continued through 2008, about a year later than originally planned. "It would have cost us $6 million either way, but because we waited, Mishicot paid 9 percent of the cost," says Lambries.

Serving Mishicot (population 1,500) costs only about $30,000 a year. The village contributes about 70 million gallons per year. In return, Two Rivers realizes $108,000 a year in revenue. The village also will pay its share of future capital costs based on its share of the flow.

BETTER ALL AROUND

The Two Rivers plant's two old anaerobic digesters had no heating and no mixing and created no methane. "We had gas compressors, but we weren't generating any methane, so they were useless," Lambries says.

Two active digesters with Ovivo mixers/heat exchangers were the key to the project. A Dystor membrane gas holder (Siemens) was added to collect the methane. The plant now uses about 15,000 cubic feet of methane per day to feed a Hurst boiler that heats the digesters to 96 degrees.

Because more water is evaporated in the heating process, biosolids production is down about 50 percent. "It was costing us $25,000 a year to haul biosolids," says Lambries. "Now we're down to $12,000 a year. By having less material, we have less cost for polymers to treat it and need less electricity to run the dewatering press."

The old plant could only

What's Your Story?

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

achieve 15 to 20 percent volatiles reduction in the biosolids, while 38 percent was required for land application without incorporation into the soil. "We're now getting 70 percent reduction," Lambries says.

The digester heating system is cross-tied to the building's HVAC. "If we have enough methane, we can use it to heat the building," says Lambries. "If we don't have enough, we can use our natural gas boilers to heat the digesters."

IMPROVED AERATION

The upgrade also enhanced aeration efficiency. Three new blowers were added along with automatic dissolved oxygen control (Hach) and variable-frequency drives (Eaton). "Our aeration system is running at 50 percent of the cost it used to," says Lambries. Blower motors that ran at a constant 60 Hz now operate at 30 to 35 Hz. "You can't control the price of electricity or natural gas, but you can do your best to keep your use as low as possible," Lambries says.

Two new biosolids pumps (Vogelsang) were installed with VFDs for even more electrical savings. This also eliminated throttle valves that controlled biosolids flow. "The pumps are in the basement and the press is on the third floor," Lambries says. "Every time we wanted to make an adjustment, the operator had to run up and down three flights of stairs. Now, the operator just presses a button."

> "Our aeration system is running at 50 percent of the cost it used to. You can't control the price of electricity or natural gas, but you can do your best to keep your use as low as possible."
>
> **LARRY LAMBRIES**

A SCADA system (Energenecs) monitors all 19 lift stations, upgraded with battery backup. Previously, lift station problems created an alarm with no indication of what was wrong. An operator then had to drive out and check each alarm.

The SCADA system also improves daily operation. "We just don't have enough people to go out and check 19 lift stations every day," Lambries says. "We were trying to do it every two weeks. Now we check them from the control room."

Nuisance odors have also been eliminated. The plant is near the city's downtown, on the shore of Lake Michigan near the entrance to the harbor, and is surrounded by a marina/campground, lakeside hotel, the library and a park.

For the future, Lambries looks forward to adding cogeneration, perhaps with a microturbine, to take advantage of more of the methane, some of which is still flared in the summer. "We don't have enough methane yet," he says. "Once it gets to a point where it makes sense, we'll pursue cogeneration."

He estimates the plant needs a load increase of 30 to 40 percent before that would be cost-effective. While it could be several years, it is an option that didn't exist before. tpo

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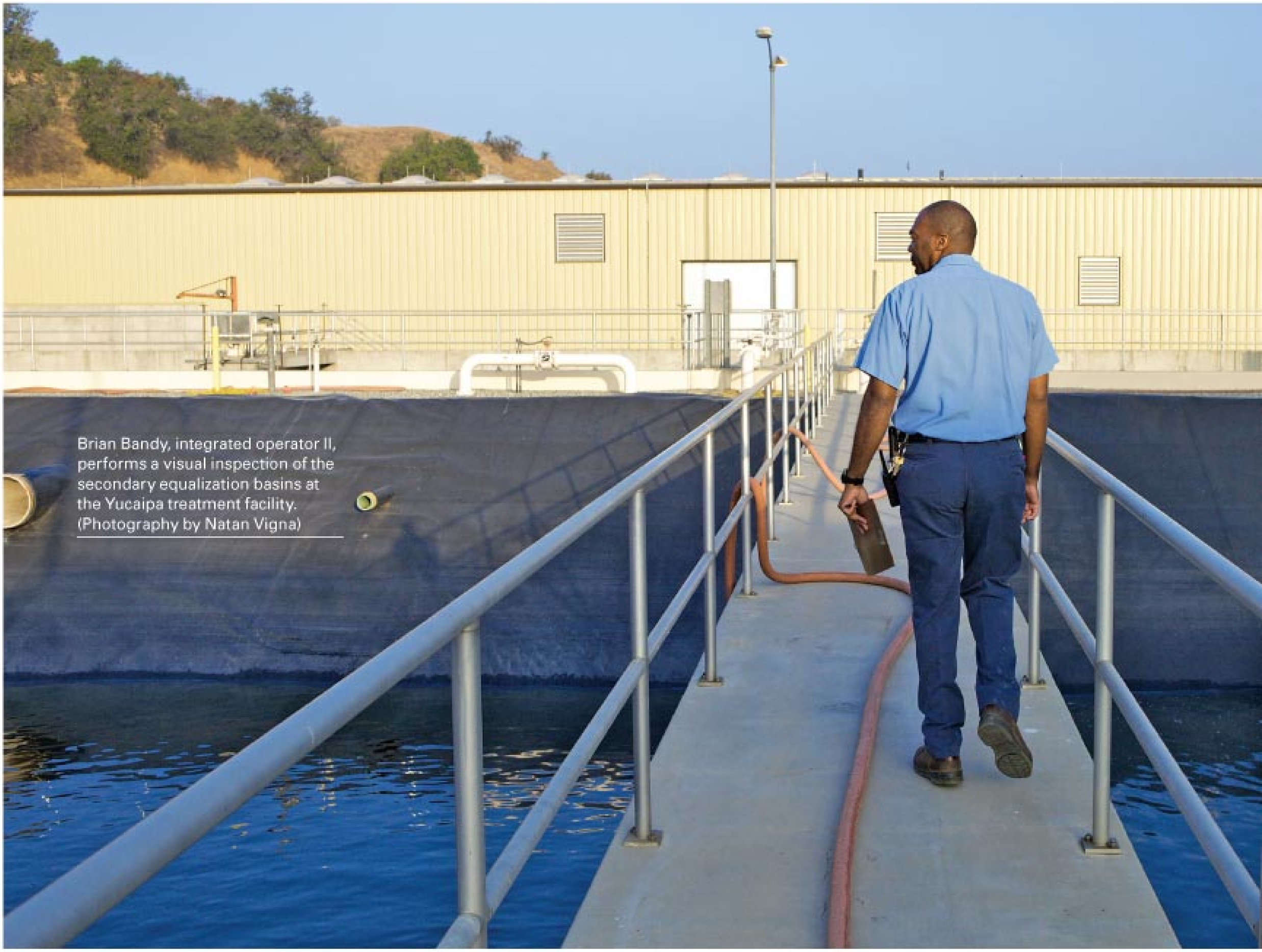
Ready *Remedies*

THE STAFF AT YUCAIPA VALLEY WATER DISTRICT TAKES ON THE CHALLENGES OF MEETING TOUGH STATE REGULATIONS IN A TOP-FLIGHT WATER RECLAIM PLANT

By Jim Force



Brian Bandy, integrated operator II, performs a visual inspection of the secondary equalization basins at the Yucaipa treatment facility. (Photography by Natan Vigna)

THE ADAGE THAT ENGINEERS DESIGN TREATMENT plants but operators make them work is never more true than at the Henry N. Wochholz Regional Water Recycling Facility in Yucaipa, Calif.

Managers Matt Harward and Kevin King and their staff have made numerous modifications and improvements to this advanced tertiary plant, upgraded in 1992 and again in 2006 to meet tightening discharge requirements, and to prepare for total water recycling in the near future. Among the improvements:

- Managing plant influent flow with equalization tanks.
- Controlling algae growth on secondary clarifier weirs.
- Fighting *Nocardia* filaments and resultant foaming.
- Reducing ammonia recycle to the biological treatment system.

"Our operators do a lot of things here," says Harward, deputy manager of the Yucaipa Valley Water District, the plant's owner. "When we have a problem, our approach is to do something about it. We try one thing at a time and see if it works. If it doesn't, we try another."

HIGHLY VISIBLE

The water recycling facility serves about 50,000 residents of the cities of Yucaipa and Calimesa in the foothills of the San Bernardino Mountains, more than 2,000 feet above the greater Los Angeles Basin.

While the community's relatively high elevation offers several benefits — including mountain views and a high-quality groundwater table fed by snowmelt — it also presents some of the most challenging wastewater treatment requirements in the nation.

The California State Water Quality Control Board has imposed increasingly stringent wastewater treatment standards on the district to ensure that its effluent does not degrade groundwater supplies in Yucaipa itself or in surface or groundwater supplies downstream. One of the requirements calls for total inorganic nitrogen (TIN) to be less than 6 mg/l — "one of the toughest TIN standards in the country," according to Harward.

COURTESY OF YUCAIPA WASTEWATER TREATMENT PLANT.

Aerial view of the Yucaipa Valley Water District wastewater treatment plant.

profile

Henry N. Wochholz Regional Water Recycling Facility, Yucaipa, Calif.

POPULATION SERVED:
50,000

BUILT:
1986 (upgrades 1992 and 2006)

FLOW:
8 mgd (design)

TREATMENT LEVEL:
Tertiary

PROCESSES:
Integrated fixed-film activated sludge (IFAS), microfiltration

BIOSOLIDS:
Anaerobic digestion, composting

STAFF:
14 (operations)

ANNUAL BUDGET:
$8 million

WEB SITE:
www.yvwd.dst.ca.us

SERIES OF UPGRADES

To meet tougher standards, the district upgraded its 1982 trickling filter/activated sludge treatment facility with dual-media sand-coal filters and denitrification towers in 1992, and increased capacity from 3 to 4.5 mgd.

In 2006, when effluent requirements tightened even further, the district replaced the existing filter and denitrification facilities and eliminated the use of chlorine gas and sulfur dioxide gas by installing advanced tertiary treatment. The new system included microfiltration and UV disinfection and expanded design capacity to 8 mgd.

Wastewater begins its journey in the headworks, where quarter-inch fine screens (WesTech) and vortex grit removal by Smith & Loveless take care of debris and sand. Rectangular primary clarifiers are equipped with solids removal mechanisms from PolyChem Systems, Division of Brentwood Industries, and Muffin Monster grinders (JWC Environmental). Primary sludge is transported by seepex and Moyno pumps to the facility's train of four anaerobic digesters.

> "Our operators do a lot of things here. When we have a problem, our approach is to do something about it. We try one thing at a time and see if it works. If it doesn't, we try another."
>
> **MATT HARWARD**

Secondary treatment is provided by an integrated fixed-film activated sludge (IFAS) system developed by AnoxKaldnes (now owned by Veolia Water). Two anoxic basins (converted trickling filters) are followed by aerobic tanks that include floating plastic media, enabling simultaneous attached and suspended-growth biological activity. According to wastewater superintendent Kevin King, Yucaipa is one of the first treatment facilities in the western United States to use the technology.

CROSS-TRAINING PAYS OFF

When the Yucaipa Valley Water District launched a cross-training program for district employees in 2004, Benny Hernandez was the first to volunteer. "I think it's very worthwhile training," he says. "It gives you a better understanding of how to manage water resources, both for drinking water and for wastewater treatment."

Across the nation, the number of cross-trained water and wastewater treatment plant operators remains small, but Matt Harward, district deputy manager of water resources, expects more districts to pursue cross-training as they learn more about the benefits.

Ben Hernandez, integrated operator III, removes a UV module rack (Trojan Technologies) in the tertiary microfiltration facility.

"It gives us much more flexibility, and makes it easier for us to schedule employees and manage our facilities," Harward says. "It also helps us reduce overtime expenses."

Employee workloads and responsibilities have shifted over time since Yucaipa implemented its cross-training program. "When I started, I worked at the drinking water plant for six months and then at the wastewater plant for six months," Hernandez says. "But now I work at each plant every other week."

He works eight consecutive 10-hour days at one plant, then gets six days off before working at the other plant for eight days. Hernandez has obtained Level 3 certifications for water distribution operator, water treatment operator and wastewater treatment operator, all of which enable him to work freely at both plants.

Some employees say cross-training also provides greater job security. Ted Crehan, the newest employee, joined the district this year specifically because it had a cross-training program. He says cross-training can make treatment plant operators more marketable, while providing their employers with added flexibility and staff efficiency.

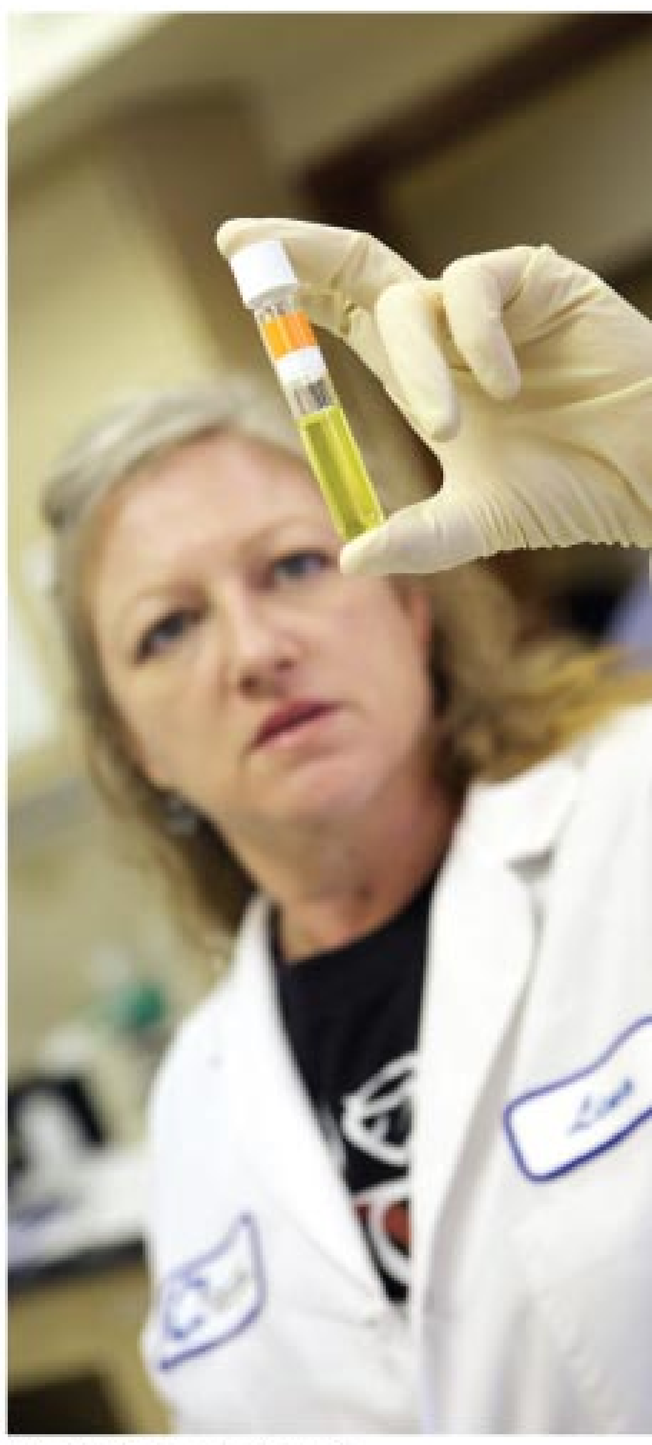
According to Harward, district employees who complete cross-training are eligible for payment bonuses when they achieve the required dual certifications.

Henry N. Wochholz Regional Water Recycling Facility
PERMIT AND PERFORMANCE (MONTHLY AVERAGES)

	INFLUENT	EFFLUENT	PERMIT
BOD	308.5 mg/l	< 2.0 mg/l	20 mg/l
TSS	297.8 mg/l	< 2.0 mg/l	20 mg/l
Ammonia Nitrogen	41.7 mg/l	2.0 mg/l	4.5 mg/l
TKN	48.0	N/A	N/A
TIN	N/A	5.3 mg/l	6.0 mg/l

Tertiary microfiltration racks (Pall Corporation) at the Yucaipa treatment facility, shown with an AquaTrend display/controller from Hach.

Floating plastic media in an IFAS basin from Veolia Water.



Lina Robert, lab chemist.

"We contacted treatment plant operators with IFAS plants around the country to assess their opinions about IFAS and other nitrate treatment options," he says. Harward and district general manager Joseph Zoba also traveled to Broomfield, Colo., which had recently installed an IFAS system, to ask questions and gain practical information and feedback on their experiences.

After final clarification in circular tanks, the treated water passes to a battery of microfiltration units (Pall). Pore size is 0.1 microns, and the units achieve exceptional removal. "We're very happy with our microfiltration system," says King. "We have the same system in our water plant, so we can share expertise as well as spare parts with our potable water staff."

The disinfection facility includes high-intensity, low-pressure UV light units (Trojan Technologies). A portion of the high-quality effluent is held in a 4-million-gallon aboveground, recycled water tank for use by two custom-

From left, Matt Harward, deputy manager; Kevin King, wastewater superintendent; and Thaxton Van Belle, senior plant operator, from the Yucaipa Valley Water District treatment plant.

ers for irrigation. The rest is discharged to San Timoteo Creek, a tributary of the Santa Ana River, which courses westward across Southern California through San Bernardino, Riverside and Orange counties to the Pacific Ocean.

"It's a shame to put it into the creek," observes Harward. And indeed, when infrastructure piping is completed over the next couple of years, all effluent will be used for irrigation in the community, and long-range plans include groundwater recharge.

Primary and waste activated sludge are mixed in the anaerobic digesters, then thickened and dewatered into Class B biosolids on Ashbrook belt presses. A local landscaper takes all the material — about 450 wet tons per month — and composts it for sale.

MAKING IT WORK

While the Yucaipa system is an elegant design, it's the ingenuity and perseverance of the operators that have enabled the plant to achieve its discharge goals. The ability to control flows using equalization tanks is a key to success, senior operator Kevin Lee believes.

"Our original design included a secondary EQ tank, but we were certain that wasn't enough," he recalls. "We insisted on having a second EQ tank at the primary stage." Both tanks are compacted soil ponds lined with polyethylene, with capacities of 1.3 and 0.8 million gallons.

Lee says the biggest advantage is the ability to smooth out diurnal flows by banking water and then releasing it for treatment at night. This is especially helpful in the operation of the microfiltration system. The EQ tanks also help with larger repairs and maintenance.

For special maintenance or repairs to parts of the treatment system, the plant can essentially turn off flow for up to 12 hours by using the EQ basins. "It's almost unheard of," King says. "We really like this feature."

One thing the staff didn't like was the rapid buildup of algae on the weirs of the secondary clarifiers. "In this hot climate, our water is quite warm," says Harward. "Plus, we get a lot of sun, so the conditions are right for algae growth."

The plant staff tried a number of remedies and finally settled on NEFCO covers over the launders and weirs to keep the sunlight off the surfaces. "We've tried scrubbing the algae off the surfaces, but we ended up having to scrub almost every day," says Harward. "It's a matter of removing the algae or preventing it from forming in the first place. We've elected to go with the latter."

> "We've tried scrubbing the algae off the surfaces, but we ended up having to scrub almost every day. It's a matter of removing the algae or preventing it from forming in the first place. We've elected to go with the latter."
>
> **MATT HARWARD**

The plant is also "blessed" with a persistent crop of *Nocardia*. "Because of the way the secondary system is designed, with isolated compartments to keep the plastic media from escaping, the *Nocardia* doesn't move out," says Harward. "It can build up foam and run down the sidewalk and into the street. It's a big problem for us."

King's staff is working on a solution that involves creating passages between the unit processes so that the *Nocardia* can move through the plant and not build up. But it's necessary to install screens in these passages so the plastic media stays in place.

The staff tried several other measures, including spraying chlorine on the water surfaces, but nothing else has really worked. "Once we understood the issue, we were able to come up with a workable solution," King says. The technique promises to help reduce a $30,000 per month expenditure for defoaming chemicals. The ultimate goal is a chemical-free solution.

In another improvement, staff has reduced the ammonia returning to the secondary treatment process by blending the microfiltration backwash

"The RO units will enable us to get our total dissolved solids (TDS) down under 370 parts per million, which is the state requirement. We obviously want to do everything we can to be in compliance."

MATT HARWARD

water with the filtrate from the dewatering process. The filtrate is high in ammonia, and the backwash water, mixed at a ratio of about 50/50, dampens its effect. "We pump the flow back at night to minimize the load on the aeration basin," explains Thaxton Van Belle, senior operator.

SMOOTH OPERATION

As a result of the operational improvements, the Yucaipa facility works very well. King says the coliform count is essentially non-detectable, even coming out of microfiltration. "We're looking at re-rating our UV system, and perhaps going with a single channel because of the negligible coliforms," he says. "We're really using our UV for virus removal only."

More challenges lie ahead. The district is considering adding reverse osmosis to the facility to recycle all of its effluent in the future. At first, the water would be used for community irrigation, but ultimately recycled water would be injected into the aquifer.

"For that to happen," King says, "the district must complete a brine discharge line some 12 miles through several communities to the main brine discharge line in San Bernardino. The cost is around $12 million." Eventually, the line goes to the Pacific Ocean.

"The RO units will enable us to get our total dissolved solids (TDS) down under 370 parts per million, which is the state requirement," says Harward. "We obviously want to do everything we can to be in compliance. The challenge for us has been that state regulations have been evolving faster than we could bring new facilities online or ensure that the water treatment technologies recommended to us by outside consultants would work as advertised."

Whatever the new requirements call for, and whatever system is designed to meet them, you can bet the Yucaipa staff will figure out how to make it work. tpo

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MORE THAN HE WISHED FOR

GILBERT SANCHEZ GOT A HUMBLE START TO A REWARDING 33-YEAR CAREER THAT HAS BROUGHT HIM GROWTH OPPORTUNITY, TRAVEL AND RECOGNITION

By Jim Force

THE JOB NOBODY WANTED WAS A DREAM COME TRUE FOR GILBERT

Sanchez. "I had just graduated from high school," he recalls. "I was 19, married and needed a job. I thought to myself 'I'd be happy shoveling poo.'"

He went to the employment office in his hometown of Twin Falls, Idaho, but the only available job was at the wastewater treatment plant. "What does that involve?" he asked. "Shoveling poo," they said.

The next morning he was in an aeration basin in a pair of boots shoveling stuff into a clamshell bucket: "I got my wish." He also got a start toward a very successful career. That first job as a laborer was in 1977. Now, 33 years later, he is project manager for Veolia Water's operation at the Caldwell (Idaho) Wastewater Treatment Plant.

In between, he has served as a supervisor for the operations firm OMI, spent time assigned to Del Rio, Texas, performed a second stint at Twin Falls, then worked at Humacao, Puerto Rico. His company has also called on him to help in startups at other treatment plants around the country.

He has Grade IV wastewater and Grade IV collections certification in Idaho and is certified by the Associated Board of Certification (ABC), which grants reciprocity in 27 states.

The Caldwell facility has been recognized by the Water Environment Federation with the George Burke Safety Award in 2003. Sanchez was the Pacific Northwest Clean Water Association's William D. Hatfield Award winner in 2007 and received the group's Distinguished Individual Service Award in 2001.

He is also past president of the Southwest Idaho Operators Association and has taken numerous correspondence courses from California State and Idaho State universities and many training courses offered by PNCWA and the Idaho Water Environment Association.

Gilbert Sanchez, project manager for Veolia Water North America at the Caldwell (Idaho) Wastewater Treatment Plant. (Photography by Steven Jeffs)

"Where else could you have a job like this?" Sanchez asks. "The travel, the education and cross-training, the people you meet, the responsibility to protect the environment. It's been good to me."

DIVERSE DUTIES

Veolia Water is in its 19th year of contracts with the city of Caldwell (population 45,000) to operate its treatment plant, a biological nutrient removal facility with an 8.5 mgd design flow and a peak design flow of 18.5 mgd.

The headworks includes Lakeside screw pumps and Parkson screens. After primary and secondary treatment, wastewater is disinfected with an ITT – WEDECO UV system and discharged to the Boise River. Digestion produces Class B biosolids, stored in lagoons and spread as liquid on farmland.

A Wonderware (Invensys Operations Management) database system tracks plant information, and the plant runs on a Hach WIMS operational program. Sanchez and his team are also responsible for 165 miles of sewers and 15 pump stations. Their equipment includes a Vactor combination truck and an Aries inspection van. The entire system is cleaned every two years.

While Sanchez is proud of the treatment plant's performance, he points out that system is the result of four upgrades over the past 20 years. The original plant dates to 1957 and consisted of a rock media trickling filter system. The most recent upgrade was the inclusion of an aeration basin in the acti-

"Where else could you have a job like this? The travel, the education and cross-training, the people you meet, the responsibility to protect the environment. It's been good to me."

GILBERT SANCHEZ

profile

Gilbert Sanchez, Veolia Water North America, Caldwell, Idaho

POSITION:	Project Manager
EXPERIENCE:	33 years
EDUCATION:	Numerous courses at California State and Idaho State universities
CERTIFICATIONS:	Grade IV wastewater, Idaho; Grade IV wastewater, ABC (reciprocity with other states); Grade IV collections, Idaho
AWARDS:	2007 William D. Hatfield Award; Pacific Northwest Clean Water Association 2001 PNCWA Distinguished Individual Award; 2003 Water Environment Federation Safety Award
GOALS:	Start up more plants for Veolia Water; support grandkids' college education; complete more upgrades at Caldwell

In his clean-water career, Gilbert Sanchez has worked in treatment plants from Texas to Puerto Rico.

Veolia Water staff at Caldwell, Idaho, includes: Back row, from left: maintenance lead Gilbert Flores, wastewater operator and biosolids coordinator Bruce Butler, and collections operator Chris Johnson; middle row, lead operator and safety coordinator William Matney, administrative assistant Sabdra Thweet, pretreatment coordinator Tammy Justus, assistant project manager John Shawcroft, and operations supervisor Joe Paulin; kneeling, project manager Gilbert Sanchez.

ABOVE: Sanchez inspects the plant's degritting system manufactured by Lakeside. RIGHT: The plant uses a gravity belt biosolids thickener from BDP Industries.

WHAT MAKES A SUCCESSFUL STARTUP?

When Veolia Water needs to start up a treatment plant, it often calls on Gilbert Sanchez. He has started up projects in Idaho, Puerto Rico, Texas, California and other sites during 33 years in the wastewater treatment profession.

Sanchez says the keys to a successful startup involve the three Ps — people, permit, and processes. "You have to have good people," he says. "You need to make sure you have the right people, and that you hire people who can eventually take over the operation and make it a success."

Second, Sanchez says, you need to know your permit — everything about what is required of the operation. Finally, you need to know the plant processes, and what they are capable of. "Make sure you have the processes that will enable you to meet your permit — and if not, understand what you need to do to meet it."

Sanchez begins each new project with the Project Start Up Guide in hand. It's developed to guide Veolia Water employees assigned to the startup team. "A startup that is well-planned and executed from the outset will have a positive impact from the front-line employees up through management and carry over in the impression provided to the client," Sanchez observes.

vated sludge system to enable biological nutrient removal.

In previous upgrades, the UV units replaced a chlorination system, the biosolids digesters were modernized, and the headworks received new screw pumps, screens, and grit removal equipment. Another expansion is on the horizon as the city contemplates adding belt presses to dewater biosolids.

Throughout the improvements, Sanchez and Veolia Water worked closely with the city and its engineering d esign company. Sanchez presents monthly operational reports to the city. "This is a great contract," he says. "We communicate openly, get together a lot to talk over ideas.

"I've worked for a number of communities in my career. At Caldwell, you don't work for the city, you work with them."

PEOPLE SKILLS

The success and recognition that have come to Sanchez are a testimony to his technical expertise, hands-on experience, and people skills. Joe Paulin, operations supervisor at Caldwell, has worked with Sanchez for several years.

"He really cares about his employees," Paulin says. "We meet every morning and go over what we've accomplished the day before. Everyone knows what's going on. He's good at communicating."

Paulin also credits Sanchez for being budget-conscious, and for promoting the wastewater profession. John Shawcroft, assistant project manager at Caldwell, admires Sanchez's management style. "He's got lots of experience," he says, "and he knows how to delegate."

Sanchez relishes his role. "Our daily meetings are a key," he says. "We sit down together for 25 to 30 minutes every morning. As a staff, we ask our-

"We talk about simple but important stuff. Looking both ways when you're driving a vehicle, keeping an eye out for poison ivy and wasps in the summer. We take a lot of pride in our work and being safe."

GILBERT SANCHEZ

selves 'What are we going to do today better than we did yesterday?' We're a small crew. We go over the numbers very closely. We want to make sure we keep doing things smarter and smarter."

And he's not just an administrator. True to his heritage in this field, he likes taking on specific tasks himself. "I just love getting out and cutting the grass every now and then," he says.

Safety is another major topic at staff meetings. "We talk about simple but important stuff," Sanchez says. "Looking both ways when you're driving a vehicle, keeping an eye out for poison ivy and wasps in the summer. We take a lot of pride in our work and being safe." The plant has gone more than 1,400 days without a lost-time accident.

FAMILY AFFAIR

At age 52, Sanchez considers wastewater treatment a family affair. His brother Anthony works for Veolia Water in the Virgin Islands, and his three children all know what to say when asked what their father does for a living.

"Wastewater," they say. "It's our bread and butter."

During his time in Puerto Rico, his children learned Spanish. And he values the travel. "It's given us a chance to get away, to see other places," he says. His kids are out of the house now, and Sanchez and his wife Lyndee are blessed with five grandchildren. They get it, as well.

"When they come down and look at the clean water leaving the plant, they say, 'Boy, grandpa, you're doing a really good job here.'

Sanchez says wastewater is his life's work. "I'm staying in it until I can help all my grandchildren get a college education," he says. Shawcroft understands. "With Gilbert," he says, "family is first." tpo

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PHOTOS COURTESY OF CONSHIELD TECHNOLOGIES

Clarifiers added in an upgrade to the Black Point Wastewater Treatment Plant were built using concrete containing an anti-bacterial additive to head off microbiologically induced corrosion.

Right In the Mix

A FLORIDA DEPARTMENT USES AN ANTIBACTERIAL CONCRETE ADDITIVE IN AN EFFORT TO HEAD OFF MICROBIOLOGICAL CORROSION IN A MAJOR TREATMENT PLANT UPGRADE

By Angus W. Stocking, L.S.

Microbiologically induced corrosion (MIC) was a persistent maintenance issue for Miami-Dade (Fla.) Water and Sewer Department (MDWASD).

"We spend a lot of money repairing corrosion," says associate director John Chorlog, P.E. "Over the last 20 years, MIC has cost us hundreds of millions of dollars."

To fight MIC in the construction of an upgrade to its Black Point Wastewater Treatment Plant, the department deployed a U.S. EPA-registered antibacterial additive mixed with concrete at the batch plant. Department leaders hope the additive will prove as successful as when used over the past 10 years to protect manholes.

BIOLOGICAL ATTACK

MIC occurs when the warm temperatures, turbulence, organic waste, and oxygen levels common in sanitary sewers create hydrogen sulfide gas and breed *Thiobacillus* bacteria. The bacteria colonize on concrete pipe and convert hydrogen sulfide to sulfuric acid, which attacks the concrete matrix and turns it into crumbly gypsum. When conditions are optimal, MIC can destroy concrete integrity in a few months.

The ConShield antibacterial additive is mixed with concrete at the batch plant. A clarifier at the Black Point plant is shown under construction using the treated material.

MIC is an especially serious problem in Florida. "We have flat topography and high groundwater which requires us to have lots of sewerage pumping stations," says Chorlog. "Coupled with our year-round warm temperatures, we have perfect breeding grounds for *Thiobacillus*."

Prevention in Miami-Dade traditionally involved epoxy coating or embedded plastic lining. But in 2001, the department tried ConShield antibacterial additive manufactured by ConShield Technologies.

"We were introduced to it by a vendor," says Wastewater Collection Division chief Rod J. Lovett. "I was interested because I'd read an article about antimicrobials that made them sound promising. So I asked if it was available separately, as an admixture."

When added to concrete, the product bonds molecularly with the material and prevents bacteria growth. It is nontoxic to humans and animals but permanently inhibits single-celled organisms like *Thiobacillus*.

PROBLEM MANHOLE

To test it, Lovett specified its use in August 2001 for a precast manhole being replaced. "This manhole in Key Biscayne has very aggressive MIC conditions," he says. "We'd been replacing the manhole, the first one out of a force main, two or three times every ten years."

For the test, Lovett directed the manhole base to be made of concrete with the additive and the manhole chimney to be made from normal material. "Eight years later, we've already replaced the corbel, but the base still looked good," he says.

Based on that success, Lovett has begun to use more of the additive. "We've built more manholes with it, and we're specifying it in our standards for both new and rehab," he says. "We don't have to worry about it peeling off or getting chipped or damaged. Because the protection is in the concrete, it can't wear off."

PART OF AN UPGRADE

Now, the department has

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specified the additive extensively in a $600 million upgrade of the Black Point plant. Francisco Fuentes, P.E., who heads the department's structural design unit and is chief engineer on the upgrade, had monitored the manhole experiment and often visited sites to see the results for himself.

So the additive became part of several large portions of the plant upgrade. "We used it for concrete in the new oxygenation train, and for four new 200-foot-diameter clarifier tanks," says Chorlog. "We also used it for pipe up-gradient of the clarifiers. The amount used is in the thousands of cubic yards and may be up to 30,000 cubic yards."

Quality control also includes ongoing testing. In the tanks, for example, stainless steel screws were placed so that the distance from the screwheads to the concrete surface can be measured, allowing any losses to be quantified over time.

"We've already taken parts of the oxygen train out of service after six months of use," says Chorlog. "We did find minimal concrete loss in some tanks below the liquid level, but we think that's just surface latents, like from oil, that are being washed off. The treated concrete above the liquid waste level where corrosion occurs looks really good."

The Black Point upgrade is important to the department, as it will increase the plant's peak capacity from 225 mgd to 285 mgd. It will also improve effluent quality and bring the plant into line with new EPA standards.

"This is a conservative utility, and we want to see proof before we take the next steps," says Chorlog. "We waited almost ten years to see how the additive worked in a manhole, and we'll probably wait for a while to see how it works out in this application. If we can avoid or delay corrosion, or put off rehabilitation for even ten years, it more than pays for itself." tpo

"We've already taken parts of the oxygen train out of service after six months of use. We did find minimal concrete loss in some tanks below the liquid level, but we think that's just surface latents, like from oil, that are being washed off. The treated concrete above the liquid waste level where corrosion occurs looks really good."

JOHN CHORLOG

Fuentes says the additive has no affect on the structural and application aspects of a concrete mix. "We didn't change our design at all, except to avoid the expense and application of coatings," he says. "The two contractors who poured the tanks told me they couldn't tell the difference. So no specialists were needed."

STRAIGHTFORWARD PROCESS

Mixing the additive with concrete is straightforward. "Basically, it's introduced at the batch plant at one gallon per cubic yard," Chorlog says. "For quality control, we reviewed mix tickets, which give us a list of concrete components for each truck. There were no issues with the mix, for us or the plant."

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Partnerships that Make Sense

NORTH CAROLINA MUNICIPAL AND INDUSTRIAL DISCHARGERS WORK TOGETHER TO COORDINATE AND ENHANCE WATERSHED MONITORING AND MANAGEMENT

By Jennie R. Atkins

As environmental pressures increase and water resources come under greater stress, wastewater dischargers across North Carolina have joined as coalitions to conduct watershed monitoring and increase their roles in water management.

One such coalition is the Middle Cape Fear River Basin Association (MCFRBA). It includes 18 industrial and municipal dischargers that together monitor 35 stations monthly in a 2,036-square-mile area of the basin.

Before the association was formed, these dischargers were required by their NPDES permits to monitor water bodies upstream and downstream of their outfall pipes. They submitted the data to the North Carolina Division of Water Quality (DWQ), and the division and the dischargers used it to evaluate the impact of individual wastewater discharges on receiving streams and rivers.

Today, MCFRBA is one of six coalitions across the state (Figure 1) that is part of the DWQ's Monitoring Coalition Program. They have collected a total of more than 500,000 data points since the program began in 1994. The information provides a more comprehensive view of developing water-quality issues and sensitive watersheds.

MAKING IT BETTER

Chad Ham, environmental programs manager with the Fayetteville Public Works Commission (PWC) notes that there were questions about the data being collected by individual entities. "The association came out of the concern that the ambient data from the dischargers was not good-quality data," says Ham, who is also MCFRBA chairman. The coalition's founding members agreed that if the data was to be collected and used, then it should be reliable.

"It is very positive to have the state sitting at the table."

CHAD HAM

The individual data sets also gave little information on the quality of the watersheds as a whole. The Cape Fear basin, like many across the state, faces increasing pressures from population growth and development, droughts, and agriculture, not to mention tighter regulations. Uncoordinated monitoring by individual dischargers gave little insight that would help meet challenges created by:

- Nonpoint sources such as stormwater and septic systems.
- Hurricanes and other natural phenomenon.
- Cumulative effects of multiple impacts.

PHOTOS COURTESY OF JENNIE ATKINS

Wesley Yance of Meritech Laboratories monitors the Cape Fear River for the Middle Cape Fear River Basin Association (MCFRBA).

Each of the six coalitions now conduct surface water monitoring within a specific watershed in exchange for members' exemption from individual permitted in-stream monitoring requirements. Influent and effluent monitoring requirements remain in force.

Altogether, the groups monitor 268 stations monthly for dissolved oxygen, nutrients, bacteria, and other parameters, providing valuable information on the quality of the waters.

Monitoring stations are selected jointly by the coalitions and DWQ with a focus on the watershed rather than the impacts of individual discharges.

Chad Davis of Environment 1 monitors for the Lower Neuse Basin Association (LNBA).

Stations are placed strategically to monitor for specific issues, such as nutrient loads, agricultural impacts and overall watershed conditions. To make the best use of all available resources, the monitoring networks are planned in conjunction with DWQ physical/chemical and biological monitoring stations, and with U.S. Geological Survey stream gauges.

PURSUING QUALITY

Both the coalitions and DWQ take active roles in data quality control and assurance. All sampling and analyses are performed by division-certified laboratories in accordance to the program's monitoring guidance document. The coalitions and DWQ audit the laboratories independently. Ten percent of coalition monitoring stations overlap with those from DWQ's Ambient Monitoring System enabling evaluation of data from both programs.

The improvements in watershed coverage and data quality assure members and DWQ that the data the coalitions collect is reliable and representative of the watershed. It also gives both groups confidence to use the data for watershed management.

Members find coalition data useful for evaluating their own wastewater facilities and for strategic planning. For example, the Fayetteville PWC has used MCFRBA data to learn more about the river's primary tributaries and to better target grants for water-quality improvements.

The coalitions themselves have used their data to evaluate the effectiveness of watershed management practices. These include nutrient reduction actions being taken by the Lower Neuse Basin Association (LNBA).

The coalitions also partner with academic and federal researchers. For example, members of the Lower Cape Fear River Program (LCFRP) have supported university research into the watershed's benthic macroinvertebrate and fish communities. The LNBA works with the University of North Carolina at Chapel Hill's Neuse River Estuary Modeling and Monitoring Project (ModMon) to better understand nutrients within the Neuse basin.

Meanwhile, the DWQ uses coalition data to assess streams and rivers, develop basin plans, determine facility permit limits, and model impaired water bodies, and USGS researchers have used coalition data to study municipal water systems and analyze agricultural impacts.

GOOD NETWORKING

Coalitions also facilitate relationships between members and DWQ through regular meetings and increased communication. "It helps to be able to ask questions in a more informal setting," says Jones. Ham agrees: "It is very positive to have the state sitting at the table."

Coalition membership does require investments. The organization and maintenance of the coalitions can be time-consuming, and the dischargers must pay membership fees. For some, membership costs more than the in-stream monitoring required in their permits.

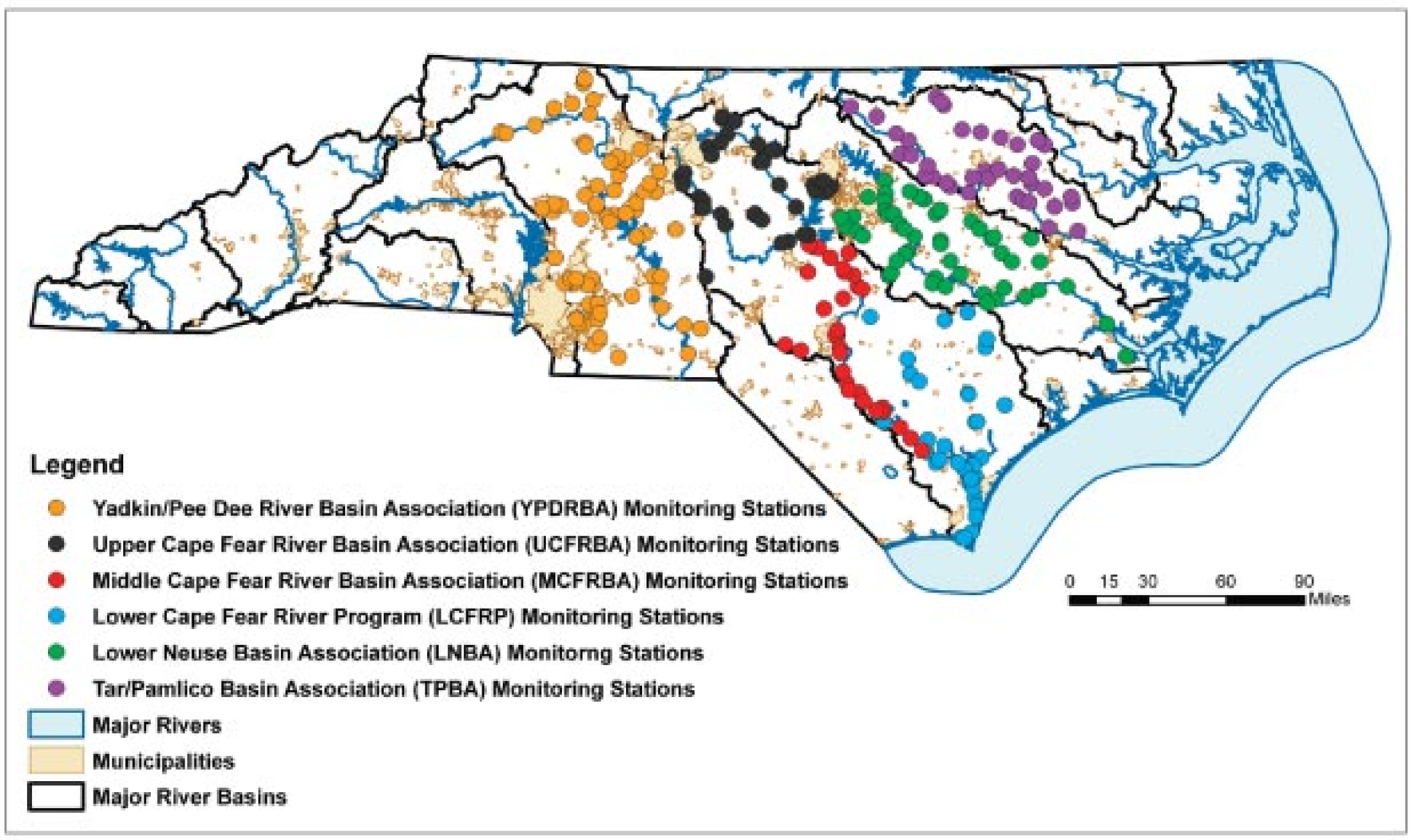

Figure 1. Monitoring sites for North Carolina's watershed monitoring coalitions.

BUILDING NETWORKS

Members find that increased knowledge of the watersheds is only one advantage of the coalitions. They speak of the networking benefits of working with neighbors and state officials on common issues, such as nutrient strategies, watershed restorations, and Total Maximum Daily Loads (TMDLs) for impaired water bodies.

For example, the Lower Cape Fear group gives members a forum for working with DWQ to develop a TMDL for the Cape Fear estuary, which has been impaired for low dissolved oxygen levels since 1998. Data collected by the monitoring program was used in modeling the system, and members have taken active roles on stakeholder committees.

Shawn O'Connor, environment, health and safety specialist with Global Nuclear Fuels, credits the program with helping members understand the TMDL process and other Lower Cape Fear issues. He says the program keeps his company informed of happenings within the watershed, and that aids in planning and decision-making. "I learn a lot about what is going on in the regulatory and environmental communities," he says.

Jeff Jones, senior engineer with Salisbury-Rowan Utilities, agrees. Salisbury has been a member of the Yadkin/Pee Dee River Basin Association since its founding in 1996. Jones also credits the association with helping to build relationships between members.

"There are some issues that could be divided into the upper and the lower Yadkin basin," he says. "The association pulls the members together as a group. I doubt I would know the people from Monroe or Union County without the association."

Ham notes that Fayetteville PWC pays a "bit more" for its membership in the MCFRBA.

On the other hand, the City of Salisbury has seen a cost savings since it joined the Yadkin/Pee Dee group. Jones attributes that to an economy of scale, since the same commercial laboratory collects and analyses all samples from the coalition's 71 monitoring stations.

> "We live here. This is our river. For a reasonable investment, we can gather a lot of information about the river."
>
> **SHAWN O'CONNOR**

Whatever the individual costs, members believe the benefits are worth it. In O'Connor's words, "We live here. This is our river. For a reasonable investment, we can gather a lot of information about the river."

For more information on the Coalition Monitoring Program, including the location of monitoring stations and the parameters monitored, visit http://portal.ncdenr.org/web/wq/ess/eco/coalition.

ABOUT THE AUTHOR

Jennie R. Atkins, Ph.D., is a coalition coordinator in the Environmental Sciences Section with the North Carolina Division of Water Quality, based in Raleigh. **tpo**

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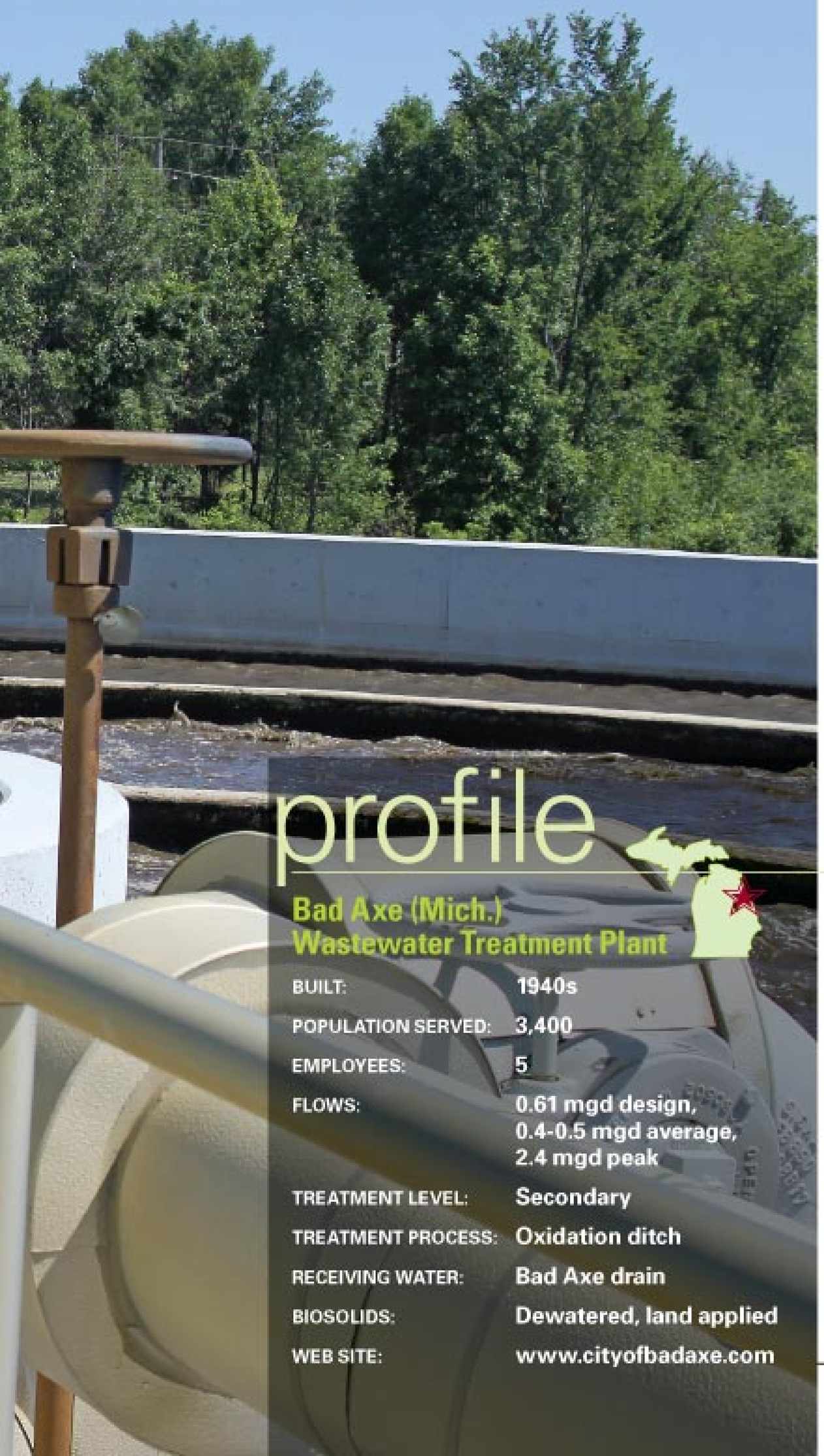
Ingenuity Saves

THE STAFF IN BAD AXE, MICH., COLLABORATED IN DESIGN OF A PLANT UPGRADE AND LATER MADE IMPROVEMENTS THAT CUT ENERGY USAGE AND DROVE DOWN COSTS

By Trude Witham

Operator Dennis McCabe checks ORP levels for the Envirodyne oxidation ditch at the Bad Axe treatment facility. (Photography by Samantha Jackson)



profile

Bad Axe (Mich.) Wastewater Treatment Plant

BUILT:	1940s
POPULATION SERVED:	3,400
EMPLOYEES:	5
FLOWS:	0.61 mgd design, 0.4-0.5 mgd average, 2.4 mgd peak
TREATMENT LEVEL:	Secondary
TREATMENT PROCESS:	Oxidation ditch
RECEIVING WATER:	Bad Axe drain
BIOSOLIDS:	Dewatered, land applied
WEB SITE:	www.cityofbadaxe.com

BACK IN 1861, TWO SURVEYORS CAMPING IN THE wilderness of what is now Huron County, Mich., found a badly damaged axe. The site became known as Bad Axe Camp.

Today, the city of Bad Axe is home to 3,400 people and a well-run wastewater treatment plant. But success didn't come easily. Built in the 1940s and upgraded in 1955 and 1984, the 610,000 gpd activated sludge plant was run down and nearing the end of its service life by 1997. Operators were having trouble handling BOD and ammonia loads.

"Our ammonia and BOD limits were tight, and the plant was prone to upsets," says Scott Boshart, director of public works. "We would violate our discharge permit limits, typically not by much, but often enough to make it a problem."

The plant went through a pair of five-year permit cycles to get to the upgrade that went online in late August 2007. "We had been through several superintendents, so we asked the Michigan Department of Environmental Quality to allow us to see what the plant was capable of – do the engineering study and agree to a compliance schedule to do the upgrades in the next permit cycle," says Boshart.

The $6.3 million upgrade included switching from conventional activated sludge to oxidation ditch treatment. Today, the plant consistently meets its permit requirements and operates much more efficiently than before. Annual cost savings from the upgrade and the operators' own innovations include:

- Potable water, $75,000.
- Natural gas, $20,400.
- Electricity, $3,000-4,000.
- Ferric chloride, $4,000-8,000.
- Biosolids, $15,500.
- Staff overtime, $20,000.

MULTIPLE IMPROVEMENTS

The 2007 upgrade reshaped the plant's process and equipment. It included a new clarifier and two rebuilt existing clarifiers (Envirodyne), a new raw sewage pumping station with ABS raw sewage, scum station and non-potable water pumps, and a preliminary treatment building with an automated 1/4-inch bar screen (Siemens) and automated grit removal (WesTech).

The new secondary treatment building includes electrical, SCADA, return activated sludge, waste activated sludge, and non-potable water systems, and the dechlorination system. The upgrade also included a 482,000-gallon Aquastore biosolids storage tank (Engineered Storage Products Co.), ITT

Panorama view of the Bad Axe (Mich.) Wastewater Treatment Plant.

Members of the Bad Axe clean-water team include, from left, director of public works and wastewater treatment plant superintendent Scott Boshart, and operators Dennis McCabe, Ken Nicholas and Jake Schumacher.

STAYING CONNECTED

The staff at the Bad Axe Wastewater Treatment Plant has made large strides to enhance performance and boost efficiency, but not without help.

Director of Public Works Scott Boshart notes that staff at the Michigan Department of Natural Resources and Environment (formerly called the Department of Environmental Quality) supported the plant's efforts before and after the major plant upgrade in 2007.

"The regulators, while pushing us to upgrade, have worked with us, and the operator training unit has always been there for us from education to troubleshooting," says Boshart. "Those guys have been a great resource."

The city is a member of the Michigan Rural Water Association (MRWA), which Boshart regards as another great resource. Boshart himself is a member of the Michigan Water Environment Association (MWEA).

"Our MWEA section holds quarterly meetings to get operators together for a short training session and lunch," he says. "A number of plants in our section have been through upgrades. We hold our meetings in those communities and tour the facilities."

Boshart stresses the importance of networking. "Don't be afraid to visit other facilities and talk to other operators," he says. "Ask for help or just talk about what's going on. The information can be priceless."

Water & Wastewater – Flygt return activated sludge pumps, ABB mag meters, Diadisk sludge transfer pumps (Fluid Tech Group Inc.), Stenner chemical feed pumps, Teledyne Isco samplers, and Generac backup generator. The old aeration tanks and primary settling tanks were abandoned in place, and the digester became the primary biosolids thickener.

Besides allowing the plant to meet its permit limits for BOD and ammonia, the oxidation ditch more effectively handles higher flows caused by infiltration when groundwater levels are high. The oxidation ditch from Envirodyne holds 835,000 gallons in three concentric rings, whereas the old aeration tank held 267,000 gallons.

Another plus was getting rid of the aeration blowers in favor of brush rotors in the ditch. "You could hear those things half a mile away, and now the plant sounds like a waterfall when you're in the park next door," Boshart says. "We have residents across the street, so there had to be some happy people when those blowers were shut off."

A bar screen system from Siemens is shown in the foreground with the WesTech grit removal system behind it.

HIGHLY QUALIFIED

Although the upgraded equipment makes a major difference, it's the staff that makes the plant successful, Boshart observes. Three full-time operators take care of the plant and 12 lift stations. They, along with Boshart and engineering consultants Fishbeck, Thompson, Carr & Huber designed the upgrade together. Plant personnel directed the engineers on the upgrade plans and asked for the most energy-efficient and cost-effective processes.

> "The preliminary treatment was one of the biggest improvements to the plant. We insisted on a top-notch headworks, and that's what we have."
>
> **SCOTT BOSHART**

Boshart started in wastewater treatment in 1989 and holds Class A and L1 wastewater licenses, as well as F2, D2, S2 water and A-1i stormwater licenses. He has been with the plant full-time for six years and was contracted as interim superintendent a few times since 1996.

Boshart's office is at the plant. He helps with some daily tasks and often walks through to monitor operations. Middle-seniority operator Dennis McCabe takes over when he is gone. He holds a Class B license and has been with the city for eight years.

Operator Ken Nicholas holds a Class D license and has been with the plant for 25 years. Jason Schumacher worked for the Public Works Department in other capacities for several years before becoming an operator four years ago. He holds a Class D license.

The operators rotate responsibilities for operations, laboratory and maintenance each week. They also rotate weekends to check the plant and lift stations.

"Everyone gets to know the whole plant, and that keeps things pretty versatile," says Boshart. "We do as much of the maintenance as we can, and we did a lot of the demolition of the old plant equipment, like removing the old blowers, raw sewage pumps and digester cover.

"We all worked together to learn the new equipment, and we have been working together to get the best biological nutrient removal results. Our goal is to keep perfecting this and keep the plant looking and functioning like

ABOVE: ITT Water & Wastewater – Flygt return activated sludge pumps and meters, and the non-potable water system tank (black, in back corner). RIGHT: Operator Dennis McCabe takes readings to monitor the aeration process.

this 15 to 20 years from now. The guys take very good care of the facility, and we've received numerous compliments from visitors that the place hardly seems like a wastewater treatment plant."

SOLVING PROBLEMS

The operations staff routinely steps up with ideas to fix process issues and to improve operating performance and efficiency. For example, shortly after the upgrade, a filamentous bacteria issue caused violations for solids, BOD and ammonia. But the problem was under control in a few days, and the staff made changes to the dissolved oxygen monitoring locations and levels so it wouldn't happen again.

"We have the ammonia removal well in hand, and we have fine-tuned the aeration process to get good phosphorus removal to meet the 1.0 ppm monthly average limit," says Boshart. The staff now keeps the first ring of the ditch at zero oxygen, and all return and raw sewage flow goes into that ring. In the next ring, the oxygen is raised to 2.0 ppm.

The staff found immediately that the new plant could meet its phosphorus limit with less ferric chloride addition. But by experimenting with the aeration setup, they were able to reduce the ferric addition by 25 percent, then 50 percent, and finally 100 percent.

"We used to get a new load of ferric every six months, and we pushed that to eight to nine months, with a goal of once a year," says Boshart. "Then last July, we were able to turn off our ferric feed and maintain effluent phosphorus levels within limits."

City of Bad Axe Wastewater Treatment Plant
PERMIT AND PERFORMANCE

	INFLUENT	PERMIT (MONTHLY)	PERMIT (7-DAY)	PERMIT (DAILY)	EFFLUENT (12-MONTH)
$CBOD_5$	264 mg/l	15 mg/l (Jan-Feb) 10 mg/l (Mar-Apr) 4.0 mg/l (May-Nov) 13 mg/l (Dec)	N/A N/A N/A N/A	23 mg/l 15 mg/l 10 mg/l 19 mg/l	3.5 mg/l
TSS	187 mg/l	30 mg/l (Dec-Apr) 20 mg/l (May-Nov)	45 mg/l 30 mg/l	N/A N/A	6.0 mg/l
Ammonia	24.6 mg/l	13 mg/l (Jan-Feb) N/A (Mar-Apr) 0.5 mg/l (May-Nov) 7.9 mg/l (Dec)	N/A N/A N/A N/A	N/A 11 mg/l 2.0 mg/l N/A	0.38 mg/l
Total P	4.5 mg/l	1.0 mg/l	N/A	N/A	0.5-1.0 mg/l

BIG SAVINGS

In total, the upgrade has paid off to the tune of $130,000 per year in operating cost savings. "We cut $1,700 a month in natural gas costs by eliminating the digester and the heating it required," says Boshart. "We are now using the primary digester as the primary sludge thickener, and we're using the secondary digester and new storage tank for final thickening of the biosolids. Final disposition is land application."

The plant had added the digester in 1955 and the secondary digester in the early 1980s. The 1984 upgrade was intended to provide for gas storage to heat the solids with digester methane, but the digester ended up being heated instead with natural gas.

Other changes have reduced costs, as well. A non-potable water system, along with some changes made before the upgrade, saves $75,000. Final effluent rather than city water is now used for purposes like chlorine feed and tank washing, which consumed 20,000 gallons of potable water per day. A submersible pump at the end of the chlorine contact chamber now feeds a bladder tank, which in turn feeds the chlorination system.

The plant switched to a lower primary electric rate structure by taking ownership of its power transformer and switchgear. The city is now responsible for maintenance and repairs on that equipment and delegates the work to a local electrical contractor.

"We also have a new backup gen-erator that can run our whole facility if the power goes off," says Boshart. "It has a 1,250-gallon diesel fuel tank, which we modified after the project to fuel our public works equipment."

Now that the plant can process high ammonia levels, the city accepts leachate from a local landfill containing 600 ppm of ammonia. That brings $30,000 to $35,000 in annual revenue. The leachate is delivered by tank truck to one of the old aeration tanks and is slowly fed to the head of the plant.

SAVING LABOR

The upgrade has made some tasks easier. For example, the automated bar screen and grit removal system replaced a comminutor and manually cleaned grit channel. The poor headworks caused excessive wear and constant plugging of pumps and piping. The staff now can focus on routine maintenance and getting the most out of the plant.

"The preliminary treatment was one of the biggest improvements to the plant," says Boshart. "We insisted on a top-notch headworks, and that's what we have."

With capable dedicated operators and efficient, energy-saving processes, the Bad Axe treatment plant looks to a bright future of quality service to its community. tpo

more info:

ABB Automation
800/435-7365
www.abb.com

ABS USA
203/238-2700
www.absgroupusa.com

Engineered Storage Products Co. – Aquastore
815/756-1551
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Envirodyne Systems, Inc.
717/763-0500
www.envirodynesystems.com

Fishbeck, Thompson, Carr & Huber, Inc.
800/456-3824
www.ftch.com

Fluid Tech Group, Inc.
217/839-4426

Generac Power Systems
888/436-3722
www.generac.com

ITT Water & Wastewater – Flygt Products
203/712-8999
www.ittwww.com

Siemens Water Technologies
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www.isco.com

WesTech Engineering, Inc.
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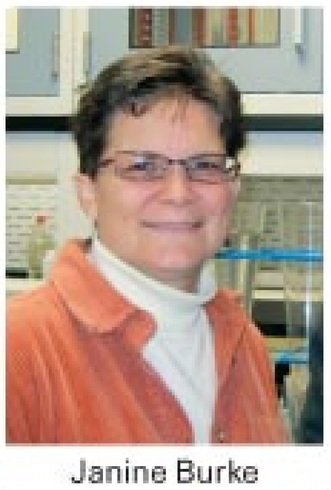
Underwater

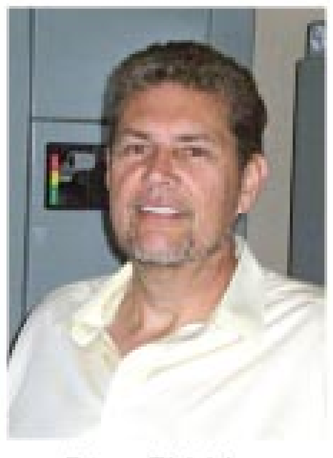
MANAGERS AND OPERATORS AT TWO RHODE ISLAND TREATMENT PLANTS REPORT EXPERIENCES AND LESSONS LEARNED FROM THE SEVERE FLOODS OF MARCH 2010

By Ted J. Rulseh



Janine Burke

Patrick Doyle



Peter Eldridge

In 2010, many parts of the United States saw severe flooding. In late March, Rhode Island received storms that in some areas produced what observers later called a 500-year flood.

That meant big trouble for the Warwick and West Warwick wastewater treatment plants, both built on sections of 100-year floodplain along the Pawtuxet River. The flood overwhelmed both plants, taking them completely out of service for a time.

The events began with what plant personnel call the "little flood," about six inches of rain that fell in four hours on March 17. The area then received nearly eight inches of rainfall in a 24-hour period leading up to March 30, on ground already well saturated. Cumulative rainfall for March was nearly 15.5 inches — a record for the month.

After weeks of struggling to get treatment back online, the managers and staffs, along with engineering consultants and contractors, spent much of the year restoring and replacing equipment and electrical systems.

Representatives from both plants shared their experiences, and lessons that may someday help other plants face emergencies of their own, in interviews with *Treatment Plant Operator*. Participants were:

- Janine Burke, executive director of the Warwick Sewer Authority.
- Patrick Doyle, assistant superintendent of the Warwick Wastewater Treatment Facility, a 7.7 mgd advanced secondary treatment plant.
- Peter Eldridge, superintendent of the West Warwick Regional Wastewater Treatment Facility, a 10.5 mgd tertiary plant.

> "We had to keep the wastewater flowing so it didn't back up into the rest of the city. It kind of tugged at the heartstrings to come to a treatment facility that had run so well and see raw wastewater being discharged to the environment."
>
> **PATRICK DOYLE**

tpo: Can you describe the location of your treatment plant?

Burke: We're in a little nook, a little bend of the Pawtuxet River. The river basically wraps around us on three sides. In the early 1980s, they built a levy around the treatment facility. It's only on three sides — we have Interstate 95 on the fourth side. The levy is 17 feet high and 21 feet above the 100-year flood elevation.

Eldridge: We're about two miles upstream from Warwick. We're not protected by a levy. We have an average of four-and-a-half-foot walls on the clarifiers. For the pump stations that are below grade, we have to climb stairs and then go down into the pump room. All of our walls had been high enough, until this event.

tpo: What exactly happened on and around March 30?

Burke: On Monday (March 29), it began to rain. Tuesday morning it was obvious things were getting pretty bad. Our superintendent, Joel Burke (no relation to Janine), told me we would need to shut down a couple of pumping stations. I went to the city's Emergency Operations center to record a reverse 911 call to the residents served by those pumping stations, telling them not to flush their toilets or their facilities until further notice.

Meanwhile, our guys were moving equipment and vehicles out, getting our camera equipment and vacuum trucks secured on high ground. A little after one o'clock, they called me to say the river water was coming up over the levy and starting to fill the treatment plant.

Doyle: At that point our facility was like a big soup bowl that started filling up. The water overtook the tanks and ended up being as high as three feet above the levy.

Burke: I would say within 45 minutes this place had a couple of feet of water in it. Some of the guys stuck around to move records and computers up to the second floor of our operations building, trying to get things out of harm's way. But then finally they had to get the heck out of here.

Eldridge: I could see the water backing up into our facility and just overtaking our secondary clarifiers. In what seemed like a really short time, we were underwater. We were able to keep on pumping from our eight pump stations. If anything was good about this event, it's that we didn't have any wastewater backing up into people's houses.

tpo: What were conditions like at the height of the flood?

Burke: In my office, which is at the high end of the plant near Route 95, there was six feet of water. And at the low end of the plant, there was about 10 feet. One of our people did a quick calculation and determined that we had about 75 million gallons of raw sewage and river water sitting in our plant basin.

Doyle: While the treatment plant was underwater, we still had 42 or 43 of our 48 pump stations pumping raw wastewater into the

The West Warwick Regional Wastewater Treatment Facility two days after the flood. (Photo courtesy of Peter Eldridge, plant superintendent)

The Warwick Wastewater Treatment Facility, the day after the flood. (Photo courtesy of Janine Burke, executive director, Warwick Sewer Authority)

basin. So there was a big bypass right into the Pawtuxet River. We had to keep the wastewater flowing so it didn't back up into the rest of the city. It kind of tugged at the heartstrings to come to a treatment facility that had run so well and see raw wastewater being discharged to the environment.

"It's amazing what the guys and women that work here have been through. They really stepped up to the plate and did everything they could, as safely as they could, to help us get this plant back online."

PETER ELDRIDGE

tpo: As the floodwaters crested and began to recede, how did you begin to restore treatment?

Eldridge: It took at least three days for the river to recede totally out of the plant. And then we started a lot of cleanup, a lot of hosing down, as the days went on. Right off the bat we had chlorine delivered — we normally have UV disinfection — and we started disinfecting.

All our pump stations were still pumping to us. We had flows going through the primary clarifiers, although we couldn't pump our sludge out. We had no aeration at all. We were able to settle everything out that we could, and the water we had going out, we were able to disinfect.

Doyle: We'd been able to save our SCADA servers and get them to high ground, and that enabled us to get monitoring capabilities back for our pump stations within a week. Once the plant basin was pumped out, we got back in and started cleaning up.

Burke: The flood didn't go down far enough until Friday for us to start dewatering the facility. So in the interim, all we could do was plan for how we were going to get out of this thing. We brought in our engineers (Hart Engineering Corp. of Smithfield, R.I.), and anybody we thought could help us, and we figured out a plan.

Joel and Patrick worked with the engineers to come up with a critical path — what equipment we needed to address first. Obviously, we wanted to get the preliminary treatment up and running and re-establish forward flow at least through some tanks so we would have a point where we could disinfect it.

Doyle: One advantage of getting Hart involved early on was that they had the resources and contacts. They were able to quickly mobilize some huge dewatering equipment and get it here fairly quickly.

tpo: Presumably the flood knocked out utility power. How did you go about restoring electricity?

Eldridge: As soon as the plant was going underwater, I ordered a 1,500 kW generator from the local Caterpillar dealer. It arrived in the late afternoon and was set up. As of late August, we were still on generator power. At that point we had the 1,500 kW unit and one 800 kW machine.

Our engineers (James J. Geremia & Associates of Providence, R.I.) came right in, and we started bringing in contractors to remove damaged pumps and motors and start restoring the electrical system.

Doyle: Power was one of the first critical things we had to address. We had some of our own generating equipment, but here again Hart helped us. At one point there were nine portable generators, stationed at each of the treatment buildings. We had anywhere from a 60 kW generator for small loads up to a 400 kW for the larger-amperage draws. In total, we probably had 1,000 kW in temporary power capacity.

Hart subcontracted an electrical contractor, who hooked up, in each building, a temporary switchboard. The generators were wired directly into those temporary panels, which we were still using as of late August.

As new equipment came in, they removed the older equipment that was damaged and installed new motor control centers. Then once everything was wired in, they jumped from the temporary panel boards over to the new motor control centers.

The biggest cost in this recovery is for the electrical system. All of the electrical was underwater, and because of a wicking effect, water went into all the wires, and we basically had to pull out every single wire in the plant and rewire it.

tpo: What about restoring secondary treatment? How long did that take?

Burke: We do biological nutrient removal. We had primary treatment and disinfection back up in about a week. The next critical path was air. The blowers were completely wiped out, so we spent a lot of time getting that equipment back up and running. By the end of May, we had that system in pretty good shape. We had to get some bugs from a neighboring community.

Around the beginning of June, we had secondary treatment, and then within a couple of weeks we were back to meeting all of our permit conditions. With the BNR system and the aeration system going,

we were pretty quickly able to start removing nitrogen again.

Eldridge: We had primary treatment online two weeks after the flood event, and we had to run that way for a number of weeks before we could get anything else going. Our maintenance staff did a lot of work on the secondary clarifier motor. Then with the help of our electrical contractor, and more portable generators, we were able to get the secondary skimmer arms going. That was accomplished by the end of June.

Tertiary treatment came back online in mid-August. We have a biologically aerated filtration system made by Infilco Degremont with upflow media filtration. We spent about six weeks changing out all the valves, pulling all the wiring and installing all new drain valves. Then we backwashed the media, started running methanol for a carbon source, and gradually got our numbers back to where we're supposed to be.

tpo: How well would you say your plant team responded to this event?

Eldridge: It's amazing what the guys and women that work here have been through. We had some tough conditions. There were no refrigerators, no soda machines, no sinks. There were portable toilets around the plant. They really stepped up to the plate and did everything they could, as safely as they could, to help us get this plant back online.

Burke: When this first happened, I said to myself, "This is going to take a year." Yet in a week, we established forward flow through the plant. It was amazing to me.

Doyle: The first week, our guys were working anywhere from 65 to 70 hours. That tapered down to maybe 60 or 65 hours the second week. Within four weeks we were back down to 40 hours a week.

tpo: What was the total cost of this disaster?

Eldridge: We are a little shy of $10 million. Our insurance policy is $10 million, so we should be able to handle the recovery without going through FEMA.

Burke: We estimate $10-12 million, and we have $10 million flood insurance.

tpo: What lessons did you learn from this experience that might help other operators deal with emergencies or natural disasters?

Burke: You need to have a plan. We didn't really have a plan for this, to be honest. We thought we were protected by our levy. Still, it all came together and things really worked out well. A bigger issue is that we need to get the wastewater profession involved in emergency response exercises. It seems like people just forget about us, and yet it's a major public health issue if your treatment facility is not operating.

I think as a result of this flood, the fire and the police departments, the mayor's office, the department of public works, and everyone has much more respect for what we do and how we do it. Wastewater needs to be part of the incident command structure in every local community.

Doyle: From a more hands-on perspective, before the flood our SCADA system was down on the ground level. We have a second floor in our operations building, so we've moved all our computer equipment upstairs to get it out of harm's way. We've moved our servers, the city servers, and the SCADA network servers.

> "I think as a result of this flood, the fire and the police departments, the mayor's office, the department of public works, and everyone has much more respect for what we do and how we do it. Wastewater needs to be part of the incident command structure in every local community."
>
> **JANINE BURKE**

Eldridge: At the time of the flood, we were in the process of upgrading our filing system and converting our stored documents to digital. We had a number of things that got wet. If I could do anything over again, that's one thing I would address. We can't move the plant, but we can keep on documenting everything we're doing and putting it in electronic format, and put paper documents in off-site storage.

tpo: Where are the positives in this experience?

Burke: If there is a silver lining arising from the sludge, it's that in the end we're going to basically have a brand-new treatment facility, with new turbo blowers and some new energy-efficient equipment.

Eldridge: We'll also be installing a new turbo blower, and we'll be upgrading our emergency generators based on what our electricity demand will be with our new phosphorus requirements. We bought three 800 kW Cat generators. tpo

Process Chemistry/ Laboratory Analysis

By Benjamin Wideman

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HQd smart probes from Hach Co.

SMART PROBES

Hach Co. offers a customized electrochemistry solution for water-quality testing. HQd smart probes automatically recognize the testing parameter, calibration history and method settings to minimize errors and setup time. Nitrate and ammonium ISE probes are longer lasting with no membranes to replace. They provide stable, consistent measurements that increase ISE measurement integrity, using a solid-state sensor and large reference junction to reduce variability. Benefits include faster stabilization for calibration and measurement due to dry storage and minimal startup conditioning. **800/227-4224; www.hach.com/smartprobes.**

SCALE INHIBITION

Belclene 445 from BWA Water Additives acts as a substitute for HEDP and PBTC where corrosion control is of concern. Its calcium carbonate scale inhibition surpasses PBTC and HEDP in chlorinated and non-chlorinated systems, making it compatible with oxidizing and non-oxidizing biocide treatments. Phosphate precipitation in the make-up water is inhibited through the stabilization of the phosphate content of the water.

Belclene 445 from BWA Water Additives

The product mediates protective film formation, resulting in improved corrosion rates and dosage minimization. It is traceable throughout the system using the same testing strategy as for tracking HEDP. **800/600-4523; www.wateradditives.com.**

DIAPHRAGM PUMP

The AD 6 pneumatic diaphragm pump from Almatec handles a maximum delivery volume of 66 gph. Delivery volume is adjustable by changing the airflow. The device has spring-loaded valves and can be installed in any position. The solid PTFE conductive housing is corrosion-resistant, and its conductivity permits use in explosion-hazard areas and with flammable liquids. It also features submersible operation; dry-lift capabilities; proof against overloading and dry-running; a maintenance-free air-control system without a dead center; PTFE diaphragms; gentle liquid displacement; and optional connection kits for laboratory and sample pulling. **630/487-2240; www.pumpsg.com.**

AD 6 pneumatic diaphragm pump from Almatec

CleanLab modular room structures from HEMCO Corp.

MODULAR ROOM STRUCTURES

CleanLab modular room structures from HEMCO Corp. are engineered to meet critical requirements for cleanroom design coupled with the demanding environment related to laboratories. The rooms meet exact size and system specifications. Modular wall construction allows flexibility to enlarge, modify, disassemble and re-erect as needs change. **800/779-4362; www.hemcocorp.com.**

ALL-MECHANICAL CLEANING SYSTEM

An all-mechanical system from Anue Water Technologies cleans wet wells and provides wastewater conditioning. It removes up to 98 percent of FOG buildup in wells through agitation and homogenization of the wastewater. While in the process, wells are washed down and the device's action significantly increases dissolved oxygen. That sets the stage for enhanced aerobic activity and efficient and lower biosolids load output. **800/559-7159; www.anuewater.com.**

CHEMICAL FEED

Chemical feed systems from Lutz-JESCO America Corp. are built to customer specifications. The chemical metering and control systems ensure process specifications and industry standards are met. The system features 3D Computer Aided Design (CAD) drawings, which include process and instrumentation drawings, system layout and design, and operation and maintenance instructions. Each system is assembled and tested in advance. **800/554-2762; www.jescoamerica.com.**

Chemical feed systems from Lutz-JESCO America Corp.

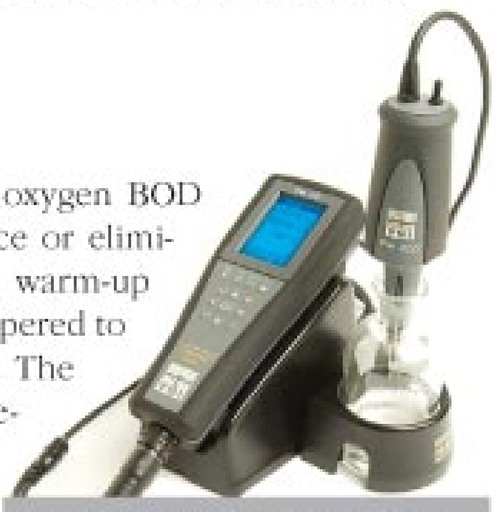
Chloritrol metering system from Fluid Metering

VALVELESS METERING

Fluid Metering offers the Chloritrol valveless metering system for accurate, maintenance-free injection of sodium and calcium hypochlorite. Accurately metering liquid sodium hypochlorite presents a challenge because of the fluid's tendency to out-gas. The system has a valveless duplex pump design. The first pump head is high-pressure and injects sodium hypochlorite directly into the water. The second pump head functions to remove out-gas bubbles from the inlet side of the high-pressure pump head. **800/223-3388; www.fmipump.com.**

BOD PROBE

The ProOBODM optical dissolved oxygen BOD probe from YSI enables users to reduce or eliminate membrane changes, calibrations, warm-up times and interferences. The probe is tapered to fit into a standard 300 ml BOD bottle. The probe is self-stirring to ensure a representative sample and comes with a 2-meter cable, power supply and optical sensor cap. **800/765-4974; www.ysi.com.**



ProOBODM optical dissolved oxygen BOD probe from YSI

Chlorometer Duo chlorine tester from Palintest

HANDHELD CHLORINE TESTER

The Chlorometer Duo handheld chlorine tester from Palintest uses a photometric analyzer and DPD method for laboratory, treatment plant and field applications. An intuitive interface produces definitive results without extensive training or data interpretation. The waterproof (IP67 rated) device can test for free and total chlorine from 0.01 to 5 mg/l with an HR selection for ranges from 1 to 250 mg/l. The last 10 results are stored in memory for easy comparison. **800/835-9626; www.palintestusa.com.**

RAPID ANALYSIS

The compact SMART Turbo System from CEM Corporation provides automated microwave total solids determination in less than three minutes. The versatile system can measure total suspended solids and total solids in wastewater and sludge. Rapid, precise analysis provides effective control of the wastewater treatment process. It also reduces costs through effective dewatering and efficient polymer usage and decreases disposal costs by optimizing solids content.

SMART Turbo System from CEM Corporation

The IntelliTemp temperature feedback system constantly monitors weight loss and sample temperature, adjusting the power accordingly so that the sample is thoroughly dry without being overheated. This ensures fast, accurate results and reproducibility. The system is simple to operate, and methods are easily transferable from unit to unit. The user-friendly software is available in English, Spanish, French, Italian and German and provides pre-programmed methods and help screens to guide operators through a test. The system can store up to 100 methods and 300 test results. It uses 5 percent of the energy needed for conventional drying. **800/726-3331; www.cem.com.**

QuenchGone21 Wastewater (QC21W) test kit from LuminUltra Technologies

BIOMASS MEASUREMENT

By measuring the energy-carrying molecule ATP, the QuenchGone21 Wastewater (QC21W) test kit from LuminUltra Technologies directly measures the quantity and quality of biomass. The information provided allows users to proactively identify and seek out the source of process upsets in advance of effluent quality indications. It can be used to identify the optimum operating conditions for a bioreactor. **506/459-8777; www.luminultra.com.**

PERISTALTIC PUMPS

Fine dispensing peristaltic pumps from Verderflex are used in testing, dosing and analysis applications. They can be controlled with a footswitch for simple measurements, or with logic-controlled systems for microdosing. **877/783-7337; www.verderflex.com.**

Peristaltic pumps from Verderflex

Data Logger RAH-DL from Global Treat

DATA LOGGER

The Data Logger RAH-DL from Global Treat automatically collects and records data off Hydro Instruments chlorine residual analyzers. Data is recorded as often as every five seconds. An integral battery ensures that data is captured and stored even if power is lost. Data is transferable onto any computer using an SD or MicroSD media card reader. **281/370-3425; www.globaltreat.com.** tpo

PHOTOS COURTESY OF JASON HUNOLD

The landscape includes a mixture of trees, shrubs and flower beds, many set off with neatly stacked walls of landscaping blocks. The colorful displays are groomed and mulched.

Pulling Together

STAFF MEMBERS AT THE FAIRFIELD (OHIO) TREATMENT PLANT MAKE LANDSCAPING THEIR JOB AND CREATE A COLORFUL SCENE EVERY YEAR

By Pete Litterski

As chief operator at the City of Fairfield (Ohio) Wastewater Treatment Plant, Jason Hunold conducts many tours. When he does, he always hears praise for the plant's appearance and maintenance.

"Their first impression of what they see as they arrive is a nice, clean plant," Hunold says. "We never fail to get a lot of compliments on how nice the grounds are kept and how well everything is maintained. First impressions at a treatment plant give people a sense of how well the plant is operated. Well-maintained grounds are an indication of a well-run process. It shows the public that we're doing everything in our power to protect river quality."

The activated sludge treatment plant has a permitted capacity of 10 mgd and treats an average of 5.5 mgd. It serves a population of 42,000. Hunold credits the 40-year-old plant's appearance to past and present employees who have taken the upkeep of the grounds as a personal responsibility.

The landscaping took off in the early 1990s when city crews were clearing a large area of a park to make room for a picnic shelter. They salvaged eight healthy ash trees from the site and replanted them around the treatment plant office building. Today, the trees still stand at one end of the building, providing shady green canopy.

STEPPING UP

The decision to save the trees was just the first step in efforts to beautify the plant. "At the same time there was a guy who really stepped up to do some landscaping," says Hunold. The late Gene Campbell was a longtime employee who took pride in the plant's appearance. One of his enduring legacies is a hillside patch next to a maintenance building where he spelled out "FAIRFIELD" in paving blocks against a background of red.

"Gene was really the first one who stepped up and made this his project," says Hunold. "And he took care of those trees like his own." Although Campbell was the first to adopt the landscaping as a personal project, others on the staff soon took an interest. "Throughout the years a number of people have stepped up, getting what they wanted to plant and adding their own touch to the grounds," Hunold says.

> "First impressions at a treatment plant give people a sense of how well the plant is operated. Well-maintained grounds are an indication of a well-run process. It shows the public that we're doing everything in our power to protect river quality."
>
> **JASON HUNOLD**

One motivation is that Fairfield, north of Cincinnati along the Great Miami River, has received the Tree City USA designation from the Arbor Day Foundation for the past 15 years.

"Since we started receiving that award, we've stepped up our landscaping even more," Hunold says. "We're just doing our part to help the city earn that designation."

Share Your Ideas

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

The late Gene Campbell was a longtime employee who took pride in the plant's appearance. One of his enduring legacies is a hillside patch next to a maintenance building where he spelled out "FAIRFIELD" in paving blocks against a background of red.

The job involves teamwork and a bit of compromise as people bring different ideas to the task. Plant superintendent Drew Young has created plantings of everything from roses and butterfly bushes to a Japanese maple. "That Japanese maple is his real claim to fame," Hunold says. "That's right outside his office window."

The Fairfield Wastewater Treatment Plant entrance sign.

CHIEF COLLABORATORS

The landscape includes a mixture of trees, shrubs and flower beds, many set off with neatly stacked walls of landscaping blocks. The colorful displays are groomed and mulched. Their care fits neatly into the grounds maintenance routine.

The landscaping involves a partnership between two longtime employees, lead clerk June Jeffery and maintenance foreman Larry Wittman. "For the past six to eight years, they have teamed up to go to a local lawn and garden center to get the annuals for the flower beds, and it's always a big event," Hunold says.

Jeffery and Wittman make their own lists of blooms and then go shopping together. Despite some differing tastes in flowers, "they always find a way to meet in the middle," says Hunold. The teamwork continues when the two get back to the plant.

"Larry gets down on his hands and knees to do the planting and June is right over his shoulder telling him where she thinks the flowers should be planted," says Hunold.

In the end, the result is always the same: Colorful plantings that impress the plant's many visitors from the moment they enter the grounds and approach the front door. **tpo**

1. AERZEN INTRODUCES DELTA HYBRID COMPRESSOR

The Delta Hybrid rotary lobe compressor from Aerzen combines blower and compressor technology to generate positive pressure or vacuum in air and neutral gas applications, increasing energy efficiency, while reducing greenhouse emissions and energy consumption by up to 15 percent. **610/380-0244; www.aerzenusa.com.**

2. ELECTRO-CHEMICAL OFFERS ORP SENSORS

The S10 (immersion or insertion style) and S17 (valve retractable style) oxidation reduction potential (ORP) sensors from Electro-Chemical Devices feature a no-glass design with platinum or gold sensor tips. The sensors come with replaceable ORP cartridges that plug into the 316 stainless steel body. The cartridges feature PEEK (polyetheretheketone) construction and measure from -2,000 to +2,000 millivolts in temperatures from 23 to 176 degrees F. The sensors also can measure pH, dissolved oxygen, conductivity and resistivity. **800/729-1333; www.ecdi.com.**

VAL-MATIC OFFERS EPOXY-COATED AIR VALVES

The SuperValve line of wastewater air valves from Val-Matic Valve & Mfg. Corp. are internally and externally coated with fusion-bonded epoxy and holiday tested. The valves feature 316 stainless steel trim and cover bolts and Buna-N seats. **630/941-7600; www.valmatic.com.**

3. LAROX OFFERS LARFLEX RUBBER CHECK VALVES

LarFlex rubber check valves from Larox Flowsys are designed to control back pressures from abrasive, aggressive, corrosive and other demanding slurry applications. The valves require no power or maintenance and flex open with as little as 25 mm of water flow. The duckbill design prevents the valve from being jammed open, rusted or frozen shut. The valves are interchangeable with any flap-type check valve and range in size from 25 mm to 2,250 mm. **410/636-2250; www.larox.fi.**

4. ASSMANN OFFERS CORROSION-RESISTANT TANKS

Corrosion- and chemical-resistant tanks from Assmann Corp. are made from virgin high-density crosslink or FDA-compliant linear polyethylene. The tanks offer low temperature impact resistance, are UV stabilized and come in a range of capacities and colors. Custom rotational molding, accessory fittings and custom colors are available. **888/357-3181; www.assmann-usa.com.**

5. BINMASTER INTRODUCES EXTENDED ROTARY

Extended rotaries for top-of-bin mounting from BinMaster Level Controls are designed for use as a high-level alarm for level detection in bins, tanks and silos. The BMRX and MAXIMA+ genuine fail-safe rotaries feature a de-energized operation that shuts down the motor when mate-

rial is present to reduce wear and operating temperature for prolonged motor life. **800/278-4241; www.binmaster.com.**

6. WILDEN INTRODUCES H400 HIGH-PRESSURE PUMP

The H400 high-pressure, air-operated, double-diaphragm pump from Wilden is designed to transfer viscous, solid-laden slurries at high head pressures. The 1 1/2-inch pump is available with simplex technology to generate up to 250 psig. During operation, only one liquid chamber is used to pump fluid while the other is used as a pressure-amplification chamber, enabling the pump to have a flow rate of 64 gpm with a maximum suction lift of 10.1 feet and the ability to pass solids as large a 5/16 inches. **909/422-1730; www.wildenpump.com.**

7. TROJAN INTRODUCES OPEN CHANNEL UV SYSTEM

The TrojanUVSigna open channel wastewater UV disinfection system from Trojan Technologies is designed for large-scale disinfection applications. Features include 1000W TrojanUV Solo Lamp Technology, Solo Lamp Driver, staggered inclined lamp arrangement, ActiClean chemical/mechanical sleeve cleaning and built-in module lifting device. **519/457-3400; www.trojanuv.com.**

8. GREYLINE OFFERS DIFFERENTIAL LEVEL CONTROLLER

The DLT 2.0 differential level controller and open channel flow meter from Greyline Instruments Inc. features two non-contacting ultrasonic sensors. One sensor is installed upstream from the bar screen and a second downstream for differential level control. The second sensor also can be installed in a flume to control and transmit differential level control plus flow. The controller includes relays for bar screen rake and level control as well as three 4-20 mA outputs. A backlit LCD display shows level, differential level, flow and total flow. Intrinsically safe sensors and data logger are optional. **888/473-9546; www.greyline.com.**

9. SODIMATE INTRODUCES DUST EMISSION REDUCER

The Sodimix dust emission reducer from Sodimate uses powder-activated carbon to eliminate dust created from screw conveyors to slurry tanks. Dry chemical from the outlet chute drops into a wetting/agitation chamber to increase turbidity. Supply water passes through a T-shaped educator and creates a negative pressure that vacuums suspended dust from the outlet chute. On cleaning mode, a valve diverts the supply water through a reversible air/water filter connected to the conveyor outlet. The water cleans the filter and continues to the wetting/agitation chamber. The dust-free system can be mounted on existing systems. **773/665-8800; www.sodimate-inc.com.**

10. THOMPSON INTRODUCES OVT PUMP SERIES

OVT (oil-less vacuum technology) priming system series pumps from Thompson Pump feature non-contacting internal rotors for greater reliability and longevity. The dry-running pump eliminates the need for oil and associated pollutants and requires maintenance once every 20,000 hours. It also provides flows to 11,000 gpm, high heads to 350 feet and large solids handling up to four inches. The pump is available with electric or diesel drive. **800/767-7310; www.thompsonpump.com.**

(continued)

product spotlight

System Uses the Sun for Biosolids Drying

By Ed Wodalski

The THERMO-SYSTEM active solar biosolids dryer from Parkson Corp. uses 95 percent solar energy and ambient air to remove water from biosolids, producing a dry Class A material that can fuel waste-to-energy plants, coal power plants, or cement kilns.

The odorless, biologically stable and nearly pathogen-free end product also can be used as fertilizer or soil conditioner. The drying plant, which resembles a large greenhouse, has a louver-controlled fresh air inlet, sensors that monitor the climate inside and outside, a PLC that controls and monitors the drying process, speed-controlled ceiling fans for optimal airflow, and exhaust fans to maximize drying.

Biosolids containing 15 percent solids can be dried to 75 percent dried solids or more. Liquid material can be pumped into the drying chamber, or cake can be trucked in. Dried product is removed with a front-end loader or screw conveyor.

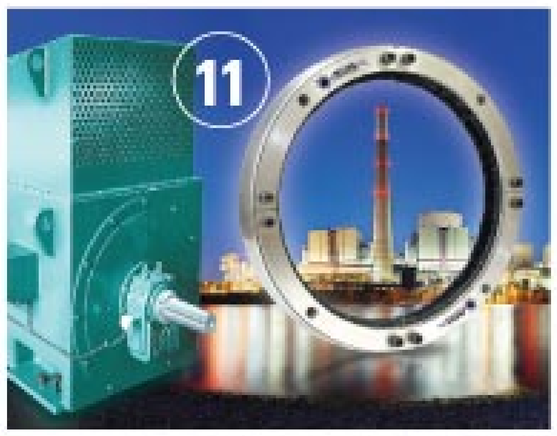
The system's main advantage is in energy savings. "You have to burn about 100 liters of oil for every ton of evaporated water or use about 100 to 140 kilowatt hours of electrical energy," says Dr. Markus Bux, inventor and THERMO-SYSTEM CEO. "With the solar drying system, you use 20 to 40 kilowatt hours of electrical energy per ton of evaporated water. And you reduce your CO_2 footprint by 90 percent."

THERMO-SYSTEM from Parkson Corp.

Electric Mole

Underfloor heating and heat exchangers are available for colder climates. Inside each drying chamber is a four-wheeled, fully automated Electric Mole. Resembling a Volkswagen Beetle, it makes one to 30 trips lasting 20 to 60 minutes around the drying plant each day. Its stainless steel paddles help mix and aerate the biosolids. Each Mole measures 7 feet long, 4.5 feet wide and 3.5 feet high and weighs 1,300 pounds. The number of units per plant varies with facility size.

Engineered with few moving parts, the drying system can be used in wastewater treatment plants from 0.2 to 40 mgd. The largest such plant, in Spain, covers 215,000 square feet and uses 24 Mole vehicles. **888/727-5766; www.parkson.com.**



11. ELECTRO STATIC INTRODUCES BEARING PROTECTION RING

The AEGIS iPRO bearing protection ring from Electro Static Technology is engineered to extend the life of medium-voltage motors and improve system reliability by safely channeling harmful electrical currents away from bearings to ground. Designed for high-current applications, the ring is available in a range of sizes to accommodate generator/motor shafts up to 30 inches in diameter. To facilitate field retrofits, the split-ring comes in mating halves. **207/998-5140; www.est-aegis.com.**

12. MSA INTRODUCES ALTAIR 4X MULTIGAS DETECTOR

The Altair 4X multigas detector from MSA features XCell sensor technology, operates with XCell sensors for combustible gas, including O_2, H_2S and CO, and is compatible with the Altair 4 Galaxy Test Stand. **800/672-2222; www.msanet.com.**

13. WARREN RUPP INTRODUCES AIRVANTAGE PUMP

The AirVantage high-efficiency, air-operated double-diaphragm pump from Warren Rupp Inc. is designed to reduce energy costs by cutting air consumption at the pump. Available in 2- and 3-inch sizes, the pump automatically adjusts airflow as process conditions change. **419/524-8388; www.idexcorp.com. tpo**

TREATMENT PLANT OPERATOR **tpo**

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Pumper & Cleaner Expo Heads to Indianapolis in 2012

The 2012 Pumper & Cleaner Environmental Expo International will be held in Indianapolis Feb. 27 to March 1. The Indianapolis facility has more than 4,000 connected hotel rooms, shopping and dining, all within walking distance. More information will be available at the 2011 Expo in Louisville, March 2-5. The 2010 Expo drew nearly 4,000 companies and 13,000 attendees from 48 countries.

Pentair Launches McLean Online Parts Store

The McLean brand online parts store from Pentair Technical Products, www.parts.mcleancoolingtech.com, features enhanced functionality, dynamic search and multiple shipping options.

APG-Neuros Chooses Headquarters Site

APG-Neuros has chosen an industrial park site in Blainville, Quebec, for its new headquarters and a production facility. The first of two buildings will occupy approximately 30,000 square feet. A second building will be constructed within the next four years.

Bentley Seeks Student Design Competition Submissions

Bentley Systems Inc., provider of infrastructure software solutions, is seeking submissions for its 2011 Student Design Competition, www.bentley.com/studentdesign2011. College and high school students are invited to submit projects designed using Bentley software, along with a short essay describing their work. Judging will be based on creativity and skills in applying design, engineering principles and the use of Bentley technology. Submissions must be received by March 18. A $1,500 scholarship will be awarded to winners at the college level and a $1,000 scholarship will be awarded at the high school level.

American Water Makes Leadership Team Changes

American Water Works Company Inc. has named Kellye Walker, former senior vice president, general counsel and secretary, chief administrative officer and general counsel. He will continue to lead the company's legal functions as well as head its human resources, communications and information technology services. The company also named Mark Strauss, formerly president of American Water Enterprises, senior vice president of corporate strategy and business development and Sharon Cameron, president of American Water Resources, president of American Water Enterprises.

Alfa Laval Reaches 125-year Milestone

Established in 1885 as the De Laval Separator Co., Alfa Laval achieved a 125-year milestone in 2010. Today, the company's heat transfer and fluid handling technologies, solutions and products are used in mining, wastewater treatment and other applications.

CH2M HILL's Daigger Takes Office as President

Glen Daigger, CH2M HILL senior vice president and chief technology officer, has transitioned from president-elect to president of the International Water Association. He will serve a two-year term.


Glen Daigger

Vacon Factory Receives LEED Gold Certification

Vacon Inc.'s factory in Chambersburg, Pa., has been awarded LEED Gold Certification as established by the U.S. Green Building Council. The 66,998-square-foot facility contains 16,232 square feet of office space and 50,675 square feet of lab, testing, assembly and distribution space.

Hach Announces 'See the BIG Picture' Contest Winners

Fairfield-Suisun, California Sewer District, received the $40,000 grand prize in Hach Co.'s See the BIG Picture contest. Prize recipients were determined based on entry creativity, impact of Hach products on the plant's applications and extent of need. Bryan, Texas, was first runner-up and received $20,000 in Hach equipment.

COLE Publishing Launches *Gas, Oil & Mining Contractor*

Gas, Oil & Mining Contractor is a new COLE Publishing trade magazine launching in January 2011. The monthly publication is directed at environmental and support service professionals working in land-based gas, oil and mining exploration, resource recovery and refinery operations throughout North America.

Readers are service company owners, managers and technicians who transport, set up and maintain equipment critical to the mission of fuel and mineral extraction companies. These services include water and wastewater conveyance and treatment, byproduct dewatering, industrial cleaning, portable sanitation equipment and maintenance, worker camp development and maintenance, electrical power generation and site preparation.

COLE president Jeff Bruss says the energy and mineral extraction and refinery sectors are being served by a diverse group of contractors who will benefit from the editorial content and focused advertising in *GOMC*.

"At a time when energy exploration and recovery of valuable mineral resources are especially critical to economic growth and sustainability, we're excited to reach out to contractors working in these industries," Bruss says. "This new publication will help the hardworking men and women who provide important support services operate more efficiently and grow their businesses."

The magazine will include profiles of successful contractors, monthly themed product roundups, comprehensive new product coverage, emerging technology coverage, industry news, and general business development and human resources topics. For more information or to request a free subscription or a media kit for the magazine, go to www.gomcmag.com. tpo

Businesses For Sale

Listings

Chicago-Area Biosolids, Land Application, Dredging and Industrial Services Business. Established in 1985, owner is retiring. Reputable business includes real estate servicing the entire Chicagoland area with sludge and biosolids disposal and treatment services. Real estate and shop included with sale valued at $750,000, business grosses in excess of $3 million annually, $6.3 million in equipment and assets including several TerraGators, Vac Trailers, dump trailers, loaders and much more. **$4,900,000.** Huge potential, good profit and priced right. Non-Disclosure Agreement required, all P&L statements, list of assets, and financials available to qualified buyers.

WANTED. Very serious and well qualified buyer looking for sewer, septic or industrial business in Dallas, Texas area. Must be grossing between $500,000-$1,000,000. All inquiries are kept confidential.

Green Bay, Wisconsin Area Septic & Drain Business. Solid and steady revenue history and nearly 20 years established. Excellent opportunity to expand or start your own business. Includes very well-maintained 3,800 gallon septic service truck, fully outfitted 2002 Chevy drain service van, drain & sewer equipment, all office equipment and computers, 2,700+ customer list, and more - a true turn-key or easy expansion opportunity. Very meticulously maintained equipment all kept inside a heated shop. Current owner is retiring. Large shop and real estate is also available if desired at additional cost. **Asking $249,000.**

Successful business with a large amount of equipment and inventory. Profitable sewer and septic business in central Pennsylvania. Increasing revenue over the past 3 years and a large amount of equipment and inventory. Equipment is a mix of old and new, but all is working and making money. **Selling price $349,000.**

Dallas/Fort Worth Texas Area Sewer/Rehab Business For Sale. Drain Cleaning, TV inspection, Pipeline & Manhole Rehab/Relining, Municipal Cleaning and Maintenance business for sale. Excellent opportunity to expand or start your own business. Good revenue history and priced to sell. Includes all equipment to get started. **Asking $150,000.**

Well-Established and Profitable Texas Septic, Sewer & Installation Business For Sale. Price reduced. Grossing in excess of $600,000 annually, customer list of nearly 2,000 accounts and 430 contracted customers. Includes nice late model equipment, most are 2007, 2008 model years. Owner retiring after nearly 40 years in business. Real estate available upon request. **Reduced to $450,000.**

Established portable restroom and septic service business located in central Virginia. Excellent gross each of the past 3 years with no decline in revenue makes this business recession-proof. Steady work including many contracts and repeat customers. Extensive equipment inventory, good revenue, and owner willing to train. Great opportunity for expansion or a new career. **Asking price $775,000.**

New Jersey VIP Restroom/ Portable Toilet Business. Servicing Metro Philadelphia and Southwest New Jersey with VIP restroom trailers and portables. Many late model assets including 2 nice service trucks, 1 back-up service truck, pick-up truck, 4 VIP restroom trailers, nearly 300 restrooms, sinks, holding tanks, slide-in unit, 2 forklifts, and more. Assets worth over $300,000 - priced to sell at **$399,000.**

Amarillo, Texas sewer, drain & plumbing business established in 1976. Owner wants to retire, so take the keys to a 2004 Sprinter outfitted with all of the equipment you'll need to run this business. Price includes real estate with 80x100 shop/office on two city lots. Good gross, good profit, financials available with signed non-disclosure. **Offered at $495,000.**

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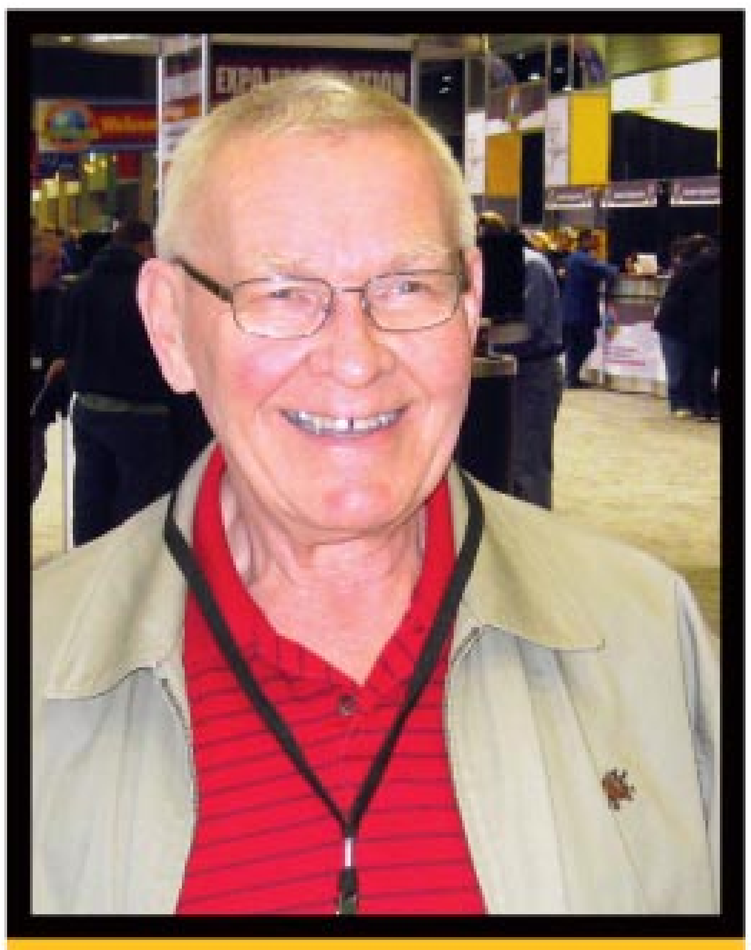

DON VERMEULEN

Meyers Co. Inc.
Fairport, N.Y.

"It's very, very worthwhile."

After 28 Expos, Don Vermeulen most appreciates the education. "I benefit equipment-wise, tools-wise, class-wise, and from developing relationships with others in the industry," he says. "You can talk to people about what they've done and how they cope with problems. We tell them about situations we've been through just to see how they react. The show also lets us see the strong points of various vendors. It prepares us to make reasonable choices about buying new equipment."

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SSCSC — Southern Section Collection Systems Committee

8 a.m.	Sewer Collection System History & the Evaluation of Pipeline Materials and Problems
9:30 a.m.	Combo Vacuuming, a Forgotten Art
11 a.m.	Keeping your Standard CCTV Inspection Program Relevant
1 p.m.	Growing Your Business by Building Your Company Image
2:30 p.m.	Pump and Lift Station Fundamentals: How to Achieve Maximum Service and Reliability
4 p.m.	Making Sense out of Nozzle Nonsense

NAWT — National Association of Wastewater Transporters

8 a.m.	So You Think You Want to Own a Waste Treatment Facility?
9:30 a.m.	Grease as a Resource
11 a.m.	Resource Recovery – Methane and Septage
1 p.m.	O & M Problems on Drip Distribution Systems
2:30 p.m.	O & M Problems We Have Seen
4 p.m.	O & M Problems with Media Filters

NASSCO — National Association of Sewer Service Companies

8 a.m.	Grout: Its Use and Application for the Total Collection System
9:30 a.m.	Cured-In-Place Pipe
11 a.m.	Pipe Bursting Tools for Everyday Utility Installations
1 p.m.	How Will You Know if You Need to do a Sewer System Evaluation Survey (SSES)?
2:30 p.m.	Laser Profiling Applications for Documenting Piping System Conditions
4 p.m.	Advancements in UV Technology for Curing CIPP

WJTA — WaterJet Technology Association

8 a.m.	Estimating the Vacuum Job for Fun and Profit
9:30 a.m.	How to Maximize the Power of Your Waterjetter
11 a.m.	Waterjetting – Financial Startup Considerations and Real-World Application

PSAI — Portable Sanitation Association International

1 p.m.	Understanding Your True Cost per Service for Special Events - Part 1
2:30 p.m.	Understanding Your True Cost per Service for Special Events - Part 2

NARC — National Association of Regulated Carriers

4 p.m.	Avoiding Violation Fines and Tickets with DOT Safety Compliance

NOWRA — National Onsite Wastewater Recycling Association

8 a.m.	Troubleshooting Our Modern Waste Stream
9:30 a.m.	Pumps – A Basic Understanding
11 a.m.	System Remediation – Why, What, When, Where and How?
1 p.m.	Selling the System to Site Conditions
2:30 p.m.	Sampling Sewage Treatment Systems
4 p.m.	Effluent Dispersal and Water Management

NEHA — National Environmental Health Association

8 a.m.	The Qualified O & M Service Provider
9:30 a.m.	Effluent Screens and Filters for Onsite Applications
11 a.m.	Develop Champions for Your Decentralized Wastewater Projects
1 p.m.	The Business of Management
2:30 p.m.	Developing O & M Inspection Actions
4 p.m.	Working with Regulators, Regulations & Industry

SCOTT HUNTER — Business Track

8 a.m.	Creating an Extraordinary Organization – The Mindset of Leadership (Part 1)
9:30 a.m.	The Mindset of Leadership (Part 2)
11 a.m.	The Mindset of Leadership (Part 3)
2:30 p.m.	Creating an Outrageously Successful Organization (Part 1)
4 p.m.	Creating an Outrageously Successful Organization (Part 2)

LRN — Leaders Resource Network

8 a.m.	The Disciplines and Art of Business Success
10 a.m.	Developing a "Fantastic" Team
1 p.m.	Diversifying or Specializing Your Services
3 p.m.	Succession Planning

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EDUCATION

RoyCEU.com: We provide continuing education courses for water, wastewater and water distribution system operators. Log onto www.royceu.com and see our approved states and courses. Call 386-574-4307 for details. (OBM)

MISCELLANEOUS

UV DISINFECTION EQUIPMENT: Attention: Small wastewater treatment plant owners and operators. Very easy installation and affordable. Up to 17 gpm. Brand new product. US patent pending. **www.thefecalfighter.com.** 614-207-9030. (o2)

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FOR SALE: 2 new ISCO Model 371OFR refrigerated composite samplers and accessories. $5,000 for both; $3,000 each. 607-545-6124; vcanaseraga@stny.rr.com. (o1)

POSITIONS AVAILABLE

Experienced Jet-Vac Truck Operator. Fast growing company looking for Operators Camera and Vac Units. Full-time and part-time positions available (East Coast). Fax work history to Pipeline Investigations, Inc. 410-242-1038 or fleetbarnes@pipelineinvestigations.com. (C02)

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QUALITY SURPLUS POLYMER WANTED: Email product number, polymer form, purchase date and quantity. Will attempt to make a cash offer. Also I can offer aggressive prices on our polymer sales to you. Email stuart @acpsouth.com. (o3)

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people/awards

Rajeshwar Dayal Tyagi of the Eau Terre Environnement Research Center won the International Water Association's 2010 Global Honour Award for Applied Research.

The **Gresham (Ore.) Wastewater Treatment Plant** received the National Association of Clean Water Agencies Platinum Peak Performance Award.

Tyler Richards has been named the president of the Georgia Association of Water Professionals.

The **Illinois Water Environment Association** received the 2010 Outstanding Member Association Award from the Water Environment Federation Board of Trustees.

The **Maize Wastewater Treatment Plant** received the 2009 Best Maintained and Operated Plant Award from the Kansas Water Environment Association.

The **Elkton Wastewater Treatment Plant** received the System of the Year Award from the Maryland Rural Water Association.

Chris Groh of the Wisconsin Rural Water Association received the Wastewater Peer Leadership Award from the National Rural Water Association.

50 years of performance

The Moccasin Bend Wastewater Treatment Plant in Chattanooga, Tenn., marked 50 years of operation Sept. 29 with a celebration attended by present and past employees, city leaders, neighboring treatment plant employees, venders, consultants and contractors.

The city began operating the 42 mgd plant in June 1960. The treatment processes included two coarse screens on the influent, three 42 mgd influent pumps, a grit removal system, four primary clarifiers, six anaerobic sludge digesters, and two vacuum filters to dewater the digested sludge.

The plant has been steadily upgraded since and is now an activated sludge secondary treatment facility with a total 220 mgd wet-weather capacity, 140 mgd design flow, and 66 mgd average flow. Class B biosolids are anaerobically digested, centrifuged, and land-applied on farms in Tennessee and Alabama.

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

education

California

The California Water Environment Association has a SARBS Collection Seminar on Jan. 20 in Huntington Beach. Visit www.cwea.org.

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

South Carolina

The Water Environment Association of South Carolina has these courses:

- Jan. 24-27 – Distribution/Collection School, Myrtle Beach
- Jan. 20 – Joint Emergency Preparedness, location to be announced
- Feb. 9-10 – Customer Service Workshop, Lexington

Visit www.weasc.org.

Texas

The Texas Water Utilities Association has a Utility Safety course Jan. 11-13 in Kingsville. Visit www.twua.org.

The Water Environment Association of Texas has a Collection Systems Conference Jan. 12-13 in San Marcos. Visit www.weat.org.

Wisconsin

The Wisconsin Department of Natural Resources has these courses:

- Feb. 1-3 – Phosphorus Removal, Introduction and Advanced, Oconomowoc
- Feb. 1-3 – Supply and Distribution, Green Bay
- Feb. 8-9 – Disinfection, Introduction and Advanced, Madison
- Feb. 8-10 – Supply and Distribution, Green Bay
- Feb. 14-18 – General Wastewater Treatment, Introduction and Advanced, Green Bay
- Feb. 15 – Water Supply Safety, Chippewa Falls
- Feb. 17 – Security and Emergency Planning for Utilities, Chippewa Falls
- Feb. 22-23 – Anaerobic Digestion, Introduction, Appleton
- Feb. 24 – Anaerobic Digestion, Advanced, Appleton
- Feb. 24 – 2011 Government Affairs Seminar, Middleton
- Feb. 28-March 4 – General Wastewater Treatment, Introduction and Advanced, Chippewa Falls

Visit www.dnr.state.wi.us/org/es/science/opcert/training.htm. **tpo**

CALENDAR OF EVENTS

Jan. 9-12
Nutrient Recovery and Management 2011, Hilton Miami Downtown, Miami, Fla. Call 703/684-2441 or visit www.wef.org.

Jan. 12-13
Impaired Waters Symposium 2011: Spanning the Water Quality Continuum – From Standards to TMDLs, Hilton Miami Downtown, Miami, Fla. Call 703/684-2441 or visit www.wef.org.

Jan. 23-26
New England Water Environment Association Annual Conference and Exhibit, Boston Marriott Copley Place Hotel, Boston. Visit www.newea.org.

Feb. 6-9
New York Water Environment Association Annual Meeting and Exhibition, New York Marriott Marquis, New York, N.Y. Visit www.nywea.org.

Feb. 8-11
Utility Management Conference 2011, Downtown Denver, Denver, Colo. Visit www.wef.org.

March 2-5
Pumper & Cleaner Environmental Expo International, Kentucky Exposition Center, Louisville, Ky. Call 800/257-7222 or visit www.pumpershow.com.

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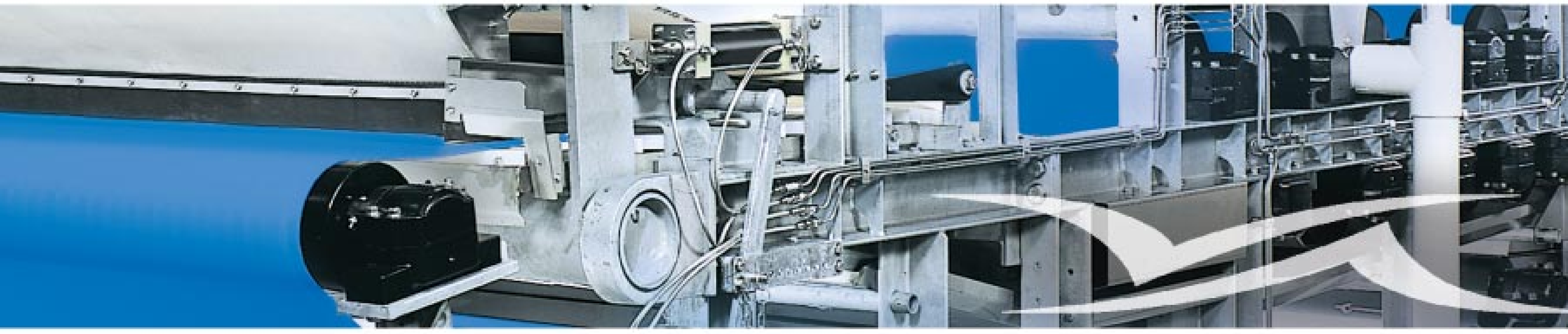

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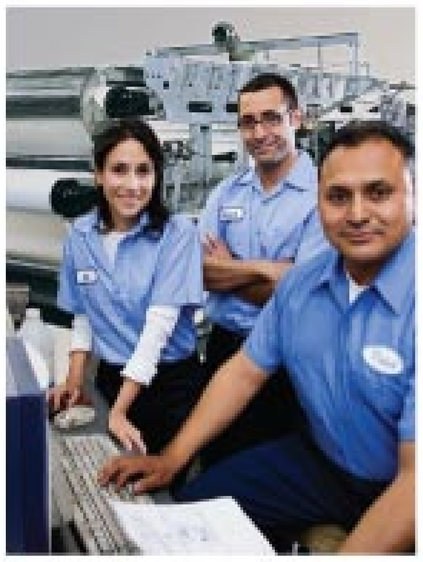

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