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MARCH 2014

**Exam Tutor:  
The secret to wastewater math**

PAGE 22

Greg Lewis,  
Wastewater Treatment  
Facility Superintendent,  
Stowe, Vt.

# Garden *Ready*

**A MOVE FROM CLASS B TO CLASS A  
MAKES ALL THE DIFFERENCE IN STOWE, VT.**

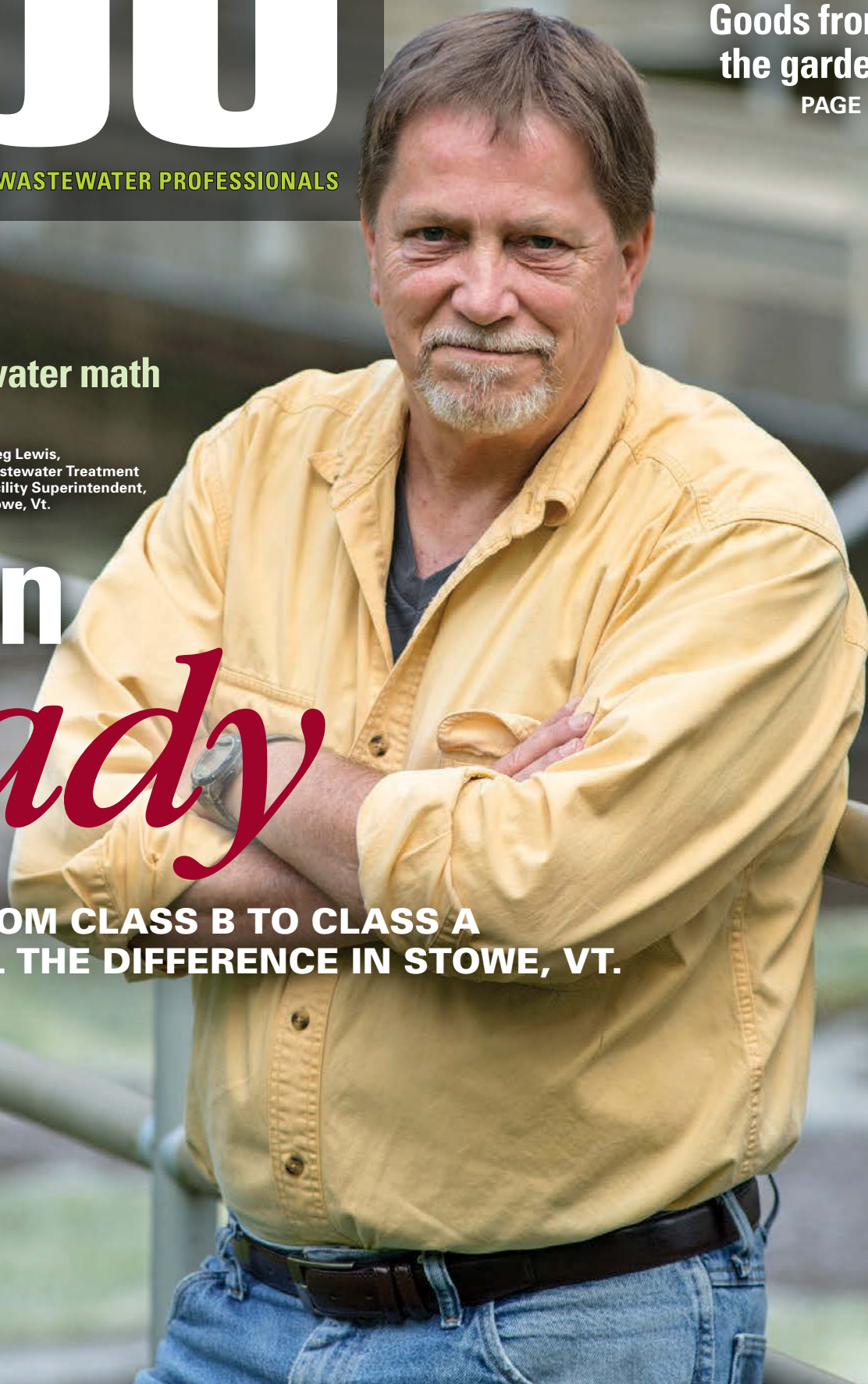
PAGE 14

**In My Words:  
Agency names do matter**

PAGE 38

**Fire Chief Project:  
Goods from  
the garden**

PAGE 10



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## advertiser index

MARCH 2014

	Aerzen USA .....	33		Kuhn North America, Inc. ....	29
	All-Star Products .....	8		Lakeside Equipment Corporation	17
	AllMax Software, Inc. ....	69		LUDECA, INC. ....	19, 21
	Aqua-Aerobic Systems, Inc. ....	71		Lutz-JESCO America Corp. ....	63
	BDP Industries, Inc. ....	35		Milton Roy, LLC .....	3
	Blue-White Industries .....	4		Moyno .....	23
	Carylon Corporation .....	65		Neptune Chemical Pump Company .....	13
	ClearSpan Fabric Structures .....	49		NETZSCH Pumps North America, LLC .....	59
	Flo Trend Systems, Inc. ....	4		Penn Valley Pump Co., Inc. ....	27
	Fresh Creek Technologies, Inc. ...	35		RELINER/Duran Inc. ....	57
	Gorman-Rupp Company .....	39		ROTO-MIX, LLC .....	59
	Hach Company .....	2		seepex Inc. ....	41
	Huber Technology, Inc. ....	7		Smith & Loveless, Inc. ....	53
	JDV Equipment Corporation .....	57		SPX .....	41
	Keller America Inc. ....	11		Tetra Tech, Inc. ....	63
	Komline-Sanderson .....	67		USABlueBook .....	72
				Vaughan Company, Inc. ....	55
				Walker Process Equipment .....	9
				Way Cool Product Co., LLC .....	67
				Weir Specialty Pumps (WEMCO) ..	29
				Yaskawa America, Inc. ....	5
				<b>CLASSIFIEDS</b> .....	67

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## features

- 13 CHANGING WITH THE TIMES**  
The industry is growing and evolving, and so is your trade show.  
By Bob Kendall
- 14 TOP PERFORMER – BIOSOLIDS: GARDEN READY**  
An auto-thermophilic aerobic digestion process helps a resort community deliver Class A biosolids in keeping with the public's high expectations.  
By Erik Gunn
- 20 HEARTS AND MINDS: PAINT ME A PICTURE**  
A Maine operator association's poster contest creates goodwill and gets great publicity during the state's official Clean Water Week.  
By Ted J. Rulseh
- 22 EXAM TUTOR: THE SECRET TO WASTEWATER MATH**  
Put the calculator aside for a moment. Learn how to factor *units* into your solutions to math problems on licensing exams.  
By Steve Duerre
- 24 TOP PERFORMER – OPERATOR: BREAKING TRAIL**  
Katie Goin and her team work methodically to upgrade the treatment and collection system in a small community in northwest Wisconsin.  
By Scottie Dayton
- 28 PLANTSCAPES: PITCHING RIGHT IN**  
Plant team members in Great Falls, Mont., are proud of their contributions to a trail built by volunteers along the Missouri River.  
By Jeff Smith
- 30 TOP PERFORMER – PLANT: BIG ASPIRATIONS**  
Operators at a Missouri lagoon treatment system maintain compliance while looking to progressive steps like biosolids land application and solar energy.  
By Trude Witham
- 36 GREENING THE PLANT: GOOD TIMING**  
Energy efficiency plans lined up with a 2009 federal government economic stimulus program to bring a Massachusetts plant close to net neutral energy.  
By Doug Day
- 38 IN MY WORDS: NAMES DO MATTER**  
Clean Water Services in Oregon sees significant and tangible benefits from naming itself for the end product, rather than the raw material.  
By Ted J. Rulseh
- 42 PUMPS COMPANY DIRECTORY**
- 48 HOW WE DO IT: SPEEDY SETTLING**  
Magnetite addition is part of a system that helps a New Hampshire plant deal with wet-weather flows and achieve complete nitrification.  
By Dana Clement and Robert Backman

### COMING NEXT MONTH: APRIL 2014

#### Product Focus: Monitoring and Instrumentation

- Top Performer – Plant: Grass Valley WWTP, Lake Arrowhead, Calif.
- Top Performer – Operator: Troy Bemisdarfer, Big Bear City, Calif.
- Top Performer – Biosolids: Solar drying in Tooele, Utah
- How We Do It: UV disinfection in Auburn, Ala.
- Greening the Plant: Beyond energy self-sufficiency in Rifle, Colo.

#### on the cover

Greg Lewis and his team in Stowe, Vt., run an efficient treatment process and deliver a high-quality biosolids product that appeals to gardeners and landscapers. Lewis is shown in front of the plant's sequencing batch reactor (SBR) tanks. (Photography by Paul Rogers)

14



30



38



24



24

## departments

- 8 LET'S BE CLEAR: FROM INSIDE OUT**  
Maybe operator associations have value beyond networking and professional advancement. Maybe public outreach from that level can multiply impact.  
By Ted J. Rulseh, Editor
- 9 LETTERS**
- 10 FIRE CHIEF PROJECT IDEA OF THE MONTH: A GREAT USE OF LAND**  
A garden tended by the crew at the Algonquin (Ill.) Wastewater Treatment Plant produced more than 900 pounds of vegetables for a local pantry.  
By Ted J. Rulseh
- 12 @TPOMAG.COM**  
Visit daily for news, features and blogs. Get the most from *TPO* magazine.
- 50 PRODUCT FOCUS: PUMPS**  
By Craig Mandli
- 58 CASE STUDIES: PUMPS**  
By Craig Mandli
- 60 PRODUCT NEWS**  
Product Spotlight: High-capacity UV system matches lamp output to disinfection needs  
By Ed Wodalski
- 64 INDUSTRY NEWS**
- 66 PROJECTS & AWARDS**
- 68 WORTH NOTING**  
People/Awards; Education; Calendar of Events

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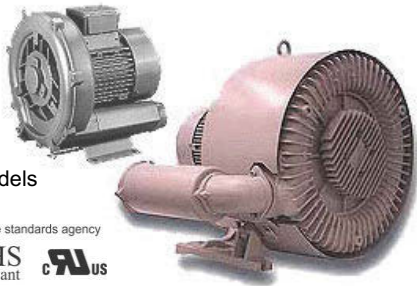
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let's be clear

## From Inside Out

MAYBE OPERATOR ASSOCIATIONS HAVE VALUE BEYOND NETWORKING AND PROFESSIONAL ADVANCEMENT. MAYBE PUBLIC OUTREACH FROM THAT LEVEL CAN MULTIPLY IMPACT.

By Ted J. Rulseh, Editor



Clean-water operator associations are generally places for networking, learning and sharing best practices. What if they could have power as focal points for public outreach?

In my years of observing and reporting on the industry, I've seen the Water Environment Federation as a major source of public education, and ditto for many clean-water agencies. In the vast middle lie the Water Environment Associations (WEF affiliates), the water pollution control associations, the wastewater operator associations, and other groups organized by state or region, mainly providing services to industry professionals.

But what if these groups added more public outreach to their missions? They don't ignore it now; most of them have public education committees and public education awards. But what if they took on a greater role as the public face of the industry in their territories?

### THE MAINE EXAMPLE

This issue of *TPO* contains an example of what I mean. The Maine Wastewater Control Association (MWWCA) sponsors an annual poster contest for kids during the state's official Clean Water Week. Such contests more commonly are conducted at the utility or plant level. So why not just leave it there?

Well, because a state organization carries more clout and covers more ground. Consider the impact in Maine. The poster contest each year includes an awards presentation at the statehouse, with the governor in attendance. Could the Any City Clean Water Plant by itself get participation from that level of government? Not likely.

Could the Any City plant get statewide pickup of a news release about its poster contest winners? Again, not likely.

### MULTIPLIER EFFECT

Of course, many treatment plants hold outstanding public



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outreach events — water festivals, special themed tours, summer camps and more. But their reach is limited. What if the best of these events could be replicated across a state or region?

Consider the WaterPalooza festival held last September by the plant team in St. Joseph, Mo. What if the Missouri Water and Wastewater Conference held a statewide WaterPalooza on a given weekend (say, around Earth Day) and issued an instruction manual for plants wishing to take part.

Now it becomes a statewide event sure to get extensive notice in print, broadcast and online media. That should mean the word gets out to more people, attendance is greater and a stronger impression is created on the public.

In a time when experienced operators are about to retire in large numbers, what's more important than elevating the profession's stature so that more young people, more military veterans, and more potential career-changers are attracted to it?

### QUESTION OF RESOURCES

Now, I understand that the primary function of operator groups is training and education. I also know that time and resources are limited — these groups rely largely on volunteers. Who's going to do all this public outreach and where will the money come from?

It's a legitimate concern. On the other hand, in this time of tight public budgets, what is more important than building public support for the clean-water profession and needed investments in facilities?

In a time when experienced operators are about to retire in large numbers, what's more important than elevating the profession's stature so that more young people, more military veterans and more potential career-changers are attracted to it?

### WHAT DO YOU THINK?

Has your association considered raising its profile with a broad public outreach effort? Is it feasible to do so given your available budget and people resources? I would be interested in your impressions. Send me a note to [editor@tpomag.com](mailto:editor@tpomag.com). I promise to respond, and we will share your comments with TPO readers in a future issue. **tpo**



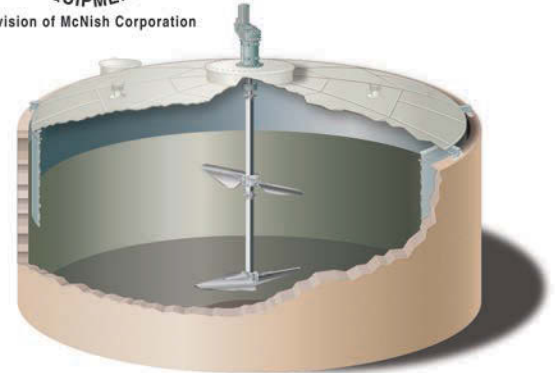
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## letters

### More fitting name

In response to your request for feedback [“What’s In a Name? Or a Title?” TPO, January 2014]: A little over 20 years ago I entered this field after a 20-year career as a U.S. Air Force officer. I didn’t think the term “wastewater plant” was describing the positive aspect of the profession, so in our city I pushed for a change and worked with the team to pick a new name. We decided upon the Fairborn Water Reclamation Center (WRC), and the city manager and council agreed.

It may not be the best name, but it at least put the emphasis on what we actually do — reclaiming “used” water by making it environmentally suitable and putting it back into the environment. We purposely chose “center” instead “facility” because (in our minds at least) “facility” simply emphasizes a building or group of buildings, whereas a “center” emphasizes a place where people think.

When we give tours (some local colleges take classes through our facility), we provide one of two handouts — which one depends on the nature of the group. Each handout includes a mission statement and objectives, which were developed by the WRC team. If you don’t know where you’re going, any road will get you there.

Finally, we prefer “team” as opposed to “staff” when referring to ourselves, since “team” better describes a group of individuals working together toward a common goal.

**Frank Barosky**  
**Fairborn (Ohio) Wastewater Manager**  
937/754-3075

**IDEA OF THE MONTH:**

# A Great Use of Land

A GARDEN TENDED BY THE CREW AT THE ALGONQUIN (ILL.) WASTEWATER TREATMENT PLANT PRODUCED MORE THAN 900 POUNDS OF VEGETABLES FOR A LOCAL FOOD PANTRY

By Ted J. Rulseh

The operating team at the Algonquin (Ill.) Wastewater Treatment Plant found a great use for part of the plant property: raising food for charity.

Last year they grew more than 900 pounds of vegetables for the Algonquin-Lake in the Hills Interfaith Food Pantry — the same amount produced in 2012, the garden's first year. The harvest included tomatoes, tomatillos, potatoes, sweet potatoes, beans, eggplant, peppers, sweet corn, cucumbers, cantaloupe, squash, radishes, basil, kale, Swiss chard and sunflowers.

The garden was a cooperative effort involving the treatment plant team, the food pantry, the Jacobs High School Green Eagles garden club (advised by science teacher Terry Stroh) and community volunteers.



## PART OF THE LANDSCAPE

The garden grew out of a landscaping project: Appearance is important to the plant because it sits along a major road at the entry to the village. The plant has a biological nutrient removal system bordered by a concrete wall 200 feet long and 10 feet high.

The village decided to “soften” the wall by building a trellis-like fence next to it and planting vines. Robert Fulton, an Eagle Scout candidate, completed the fence as his service project. Then Jim Stiegert, a village trustee who is involved with the food pantry, made a connection between the pantry and village employees.

“Everyone had a hand in it. The food pantry is open on Tuesdays and Thursdays. We’d harvest on those mornings and deliver the produce to the pantry.”

### ED BROWN

The food pantry has its own produce garden run by volunteer Laurie Selpien with help from volunteers who include Andy Warmus, Algonquin utilities superintendent; Ed Hartman, water operator; and other village staff members. Selpien gave advice on what to grow in the treatment plant garden and how to tend it.

## MANY HANDS

The 4-foot-wide garden lines both sides of the BNR wall, totaling 1,600 square feet. Green Eagles club members gave the crops a boost by starting tomato and pepper seedlings in the high school greenhouse. Village employee Vince Kilcullen delivered horse manure to enrich the garden soil. Green Eagles members, a Cub Scout pack and assorted volunteers did the planting.

“After that it was up to the crew at the wastewater treatment plant to weed the beds, water and harvest,” says Ed Brown, chief wastewater operator. “Everyone had a hand in it. The food pantry is open on Tuesdays and Thursdays. We’d harvest on those mornings and deliver the produce to the pantry.”

Team members who helped work the garden were Warmus and Brown; Tom Hall and Randall Frake, wastewater operators; Rahat Quader, lab technician; and Dalton Wall, maintenance specialist.



Shown with the fruits of their labors are, from left, Randall Frake, Dalton Wall, Tom Hall, and Rahat Quader. They're holding a cucurbita — an Italian summer squash.

PHOTOS COURTESY OF ED BROWN

## KEEPING IT GOING

The team tried a space-saving trick with some tomato and potato plants. “In one section we paired those two plants by coring a hole in the potato, placing the tomato plant through the hole, and planting them together,” says Brown. “That way we were able to grow two plants in the same spot. It seemed to work out well, although the potatoes didn’t produce as well as those we grew on the other side of the BNR tanks.”

The garden will be back next year. “The public relations value for the village has been fantastic,” says Brown. “The village board and administration have been more than supportive. It sheds a great light on the village. In the end, we’re helping some of our residents have foods they may not get otherwise.” tpo

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## CHEMICAL CONCERNS

### What's in the Great Lakes?

A recent report by the International Joint Commission assessed the effectiveness of existing wastewater treatment technologies in the Great Lakes Basin. The result? Six chemicals were found frequently and had a low removal in treated effluent. Find out what they are, and discover how the Commission hopes to improve water quality in the freshwater system.

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## ORGANIC OR NOT?

### Whole Foods Says 'No' To Biosolids

Ah, Whole Foods. We love your fancy wild-caught salmon and your fair-trade coffee. But why the hate for biosolids? Learn how customer complaints led the organic foods retailer to announce a ban on produce grown in fields fertilized with biosolids. How will you explain the decision to customers and neighbors? Find out what Online Editor Briana Jones had to say.

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*Top Issues Facing Small Wastewater Treatment Systems*

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# Changing With the Times

THE INDUSTRY IS GROWING AND EVOLVING,  
AND SO IS YOUR TRADE SHOW

By Bob Kendall

During late winter 1981, the first annual Liquid Waste Hauler's Equipment & Trade Show was held in Nashville, Tenn. The show was promoted to the 12,000-some readers of the recently launched *Midwest Pumper*. That very first show was a huge success — lauded by the couple hundred people who attended and a few dozen exhibitors.

The following year, the Liquid Waste Hauler's Equipment & Trade Show would see its first name change. The change was subtle: we only added one word — “International.” Because, after all, we didn't want to shun our friends from Canada.

In 1984, COLE Publishing launched an additional title — *Cleaner* — aimed squarely at sewer and drain cleaning contractors. This meant the show had now become more than just a liquid waste event. It would take more than a decade, but in the mid-1990s the International Liquid Waste Hauler's show again changed its name. This time, we would fully encompass everything we stood for — The Pumper & Cleaner Environmental Expo International. May no man, woman, child, country or profession ever be excluded again! So we thought.

The event would continue to grow, eventually hundreds of attendees became thousands, and dozens of exhibitors became hundreds. The Expo

hopped through several cities — Nashville, Biloxi, New Orleans, Dallas, Fort Worth and Louisville. We even tried a few western destinations and visited Las Vegas, Palm Springs, Phoenix and Long Beach.

Now, after more than 20 years, it is time to make another name change. We're not just a show for “pumpers and cleaners” — we've grown and evolved into so much more, and so have you.

imagined way back in 1979, when *Pumper* was delivered to mailboxes across a few Midwestern states.

In 2015, the Pumper & Cleaner Environmental Expo International will become **WWETT — the Water and Wastewater Equipment, Treatment & Transport show**. A little better snapshot of what we have become and where we are heading. It's a show for an entire industry of hard-working people who maintain the flow in our sewer and water infrastructure, properly treat and dispose of wastewater, keep water safe, and our environment healthy.

We haven't forgotten our roots, we just planted them a little deeper — and thanks to you they'll always have water. See you at WWETT 2015. **tpo**



Bob Kendall,  
Expo co-founder

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# Garden

# Ready

AN AUTO-THERMOPHILIC AEROBIC DIGESTION PROCESS HELPS  
A POPULAR RESORT COMMUNITY DELIVER CLASS A BIOSOLIDS  
IN KEEPING WITH THE PUBLIC'S HIGH EXPECTATIONS

By Erik Gunn

The biosolids storage bunker at Stowe Wastewater Treatment Facility holds Class A product that is popular with landscapers and gardeners. (Photography by Paul Rogers)



STOWE IS A SMALL VERMONT TOWN WITH A BIG name: It's world renowned as a ski resort that has grown to be a year-round destination. That has turned out to be a good news/bad news story for the Stowe Wastewater Treatment Facility.

Since its wastewater comes entirely from homes and the hospitality industry, the plant avoids dealing with potentially toxic industrial waste. But Greg Lewis, facility superintendent, believes the community's fame has put a spotlight on the town's wastewater treatment and biosolids recycling programs.

A lesser-known municipality might be able to avoid that spotlight, Lewis says. And the attention, fed at times by misinformation about the biosolids process and the nature of the material itself, has produced its share of challenges.

Over the last decade and a half, Stowe has made a series of treatment plant improvements, allowing it to go from producing Class B to Class A biosolids. The new product has become so popular as a topsoil amendment for landscapers and gardeners that the community has not needed to apply the material to cropland since 2008. "We generate a beautiful Class A biosolids," Lewis says. "The people who use it love it."

### POPULATION FLUCTUATION

Like many resort town treatment plants, the Stowe facility sees wastewater volume that varies with population. The year-round population is 4,000 to



The Stowe team, shown in front of SBR tanks, includes Mark Stirewalt, plant operator; Jesse Wilkesman, assistant chief plant operator; Greg Lewis, superintendent; Gwyn Wilkins-Mandigo, lab technician; and Bryan Longe, chief plant operator.

<b>POPULATION SERVED:</b>	<b>5,000 permanent, 40,000 peak tourist seasons</b>
<b>PLANT FLOWS:</b>	<b>1 mgd design, average 0.45 mgd summer, 0.65 mgd winter</b>
<b>PLANT PROCESS:</b>	<b>Sequencing batch reactors, cloth media filtration</b>
<b>BIOSOLIDS PROCESS:</b>	<b>Auto-thermophilic aerobic digestion (ATAD)</b>
<b>BIOSOLIDS VOLUME:</b>	<b>60 dry tons per year</b>
<b>BIOSOLIDS USE:</b>	<b>Class A material for gardens and landscaping</b>
<b>WEBSITE:</b>	<b><a href="http://www.townofstowevt.org/publicworks/">www.townofstowevt.org/publicworks/</a></b>
<b>GPS COORDINATES:</b>	<b>Latitude: 44°27'05.82" N; Longitude: 72°42'10.10" W</b>

5,000, but it can go up to 30,000 or 40,000 during the ski season and at other times of the year. Events like a lacrosse tournament that filled the community last July have turned the town into a four-season resort, and flows can fluctuate dramatically.

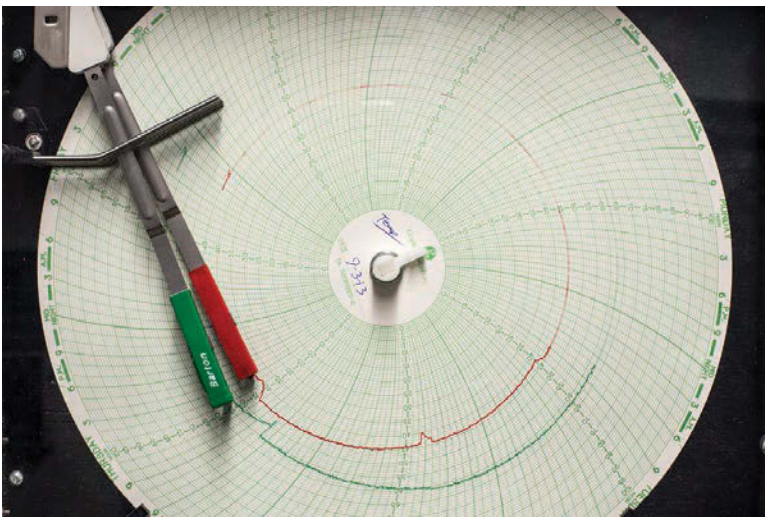
The plant was built in 1979 and expanded in 1985. "It was originally a 167,000 gpd plant and got permitted to go to 250,000 gpd," Lewis says. At the time, its territory was primarily the village at the base of Stowe Mountain. The ski resort had its own very small treatment plant for the lodge along with septic systems, and properties along the mountainside on State Route 108 also had septic systems.

Over time, and despite some opposition, the plant's territory was extended to the mountainside properties and to the resort. Until the early 2000s, the treatment plant used aerobic digesters to make Class B biosolids. Beginning in 2000, the plant underwent a major renovation that expanded its design capacity to 1 mgd and completely revamped the treatment process.

### COMPLETE RETHINKING

A driving factor was to produce pathogen-free Class A biosolids. Stowe already had a fairly clean material, but given that its raw wastewater was essentially free of toxics and heavy metals, "We felt if anybody should gener-

A temperature recorder on the auto-thermophilic aerobic digestion process control panel (Graphic Controls) helps operators track critical process temperatures.





The ATAD process (tank and operations building shown here) uses heat released by microorganisms during digestion to kill pathogens.



Jesse Wilkesman calibrates pH and ORP on wet chemical fowl air scrubbers at the control panel of the ATAD system (Evoqua Water Technologies).

“We generate a beautiful Class A biosolids. The people who use it love it.”

**GREG LEWIS**

ate a Class A biosolids, it should be us,” says Lewis. “The state wanted us to go to Class A, too.”

The project allowed the Stowe team to rethink almost every aspect of wastewater treatment.

The plant installed four Jet Tech sequencing batch reactor (SBR) tanks made by US Filter (now part of Evoqua Water Technologies [formerly Siemens Water Technologies]). “That gives us flexibility to bring the tanks on and off to try and match our flows,” Lewis explains. “We’re limited in space here. SBRs are a combination aeration and settling tank in one.”

Another benefit is that the SBR process “has a good organic uptake of phosphorus,” Lewis says. That allows the plant to reduce chemical treatments for phosphorus removal and meet its permit discharge limit of 0.2 mg/L in the environmentally sensitive Lake Champlain drainage basin.

The facility also uses ClariCone clarifiers (CB&I), which Lewis likens to “a clarifier for phosphorus removal with no moving parts.” He credits the choice with saving \$20,000 a year or more on energy. The old clarifiers were converted to blending tanks for sludge.

The plant also replaced its tertiary sand filters with AquaDisk cloth filters (Aqua-Aerobic Systems). “If you have an upset and you

## GIFT TO THE COMMUNITY

When Vermont stepped up its solid waste regulations in 1989, the Stowe Wastewater Treatment Facility needed a new place to store its Class B biosolids.

“You couldn’t store it on an open field anymore,” explains Greg Lewis, facility superintendent. Stowe built a concrete storage bunker with a capacity of about 400 cubic yards in the early 1990s.

Now that the plant produces Class A biosolids, the material is still kept in that same place. Twice a year it is tested (usually in April or September) to make sure it meets Class A requirements. Then it is made available during May and October for use by anyone from large landscaping businesses to home gardeners.

It’s a strictly low-overhead operation. The material is supplied loose, not bagged, and is given away free.

“For us, it’s not worth getting into selling it,” Lewis says. Large users — landscapers, topsoil producers, farmers and others bring in dump trucks to haul it away. Others may come with pickup trucks.

“We do have some people who take it out with 5-gallon pails for their gardens,” Lewis says. Because the highway garage is next to the site, department excavators can be used to load customers’ trucks.

Since the material doesn’t produce revenue, there is no marketing budget. Advertising “is just word of mouth,” Lewis says.

So far, that has been more than enough. “We haven’t had any problem distributing it,” says Lewis. “Anybody who has used it loves it.”

get solids into your filters, within half an hour you can take a cloth filter offline, clean it up and get it back online,” Lewis says. “If you’ve got a sand filter, you can have that filter offline for days just for that reason alone.”

At the time renovations were being planned, Lewis says, cloth filters were used mainly in drinking water treatment. Impressed with their convenience, he persuaded one manufacturer to consider restructuring its pricing and market them to the wastewater segment.

For disinfection, Stowe originally used chlorine gas but switched to less hazardous liquid chlorine. The 2000 renovation made a complete break with chemical disinfection, installing an Aquaray two-channel UV system (Ozonix North America). Says Lewis, “We just felt getting away from chemicals was the right thing to do.”

The plant recently replaced the unit’s twin control panels with a single panel that has an alarm system and better controls, and integrates with the facility’s computer system. “We’re using far less energy and we can better control our UV bulbs,” Lewis notes. “It was an investment that will probably pay for itself within two years.”

## SOLIDS SIDE

Activated sludge wasted from the SBR process contains about 0.8 percent solids — thinner in summer and somewhat heavier in winter. That material is boosted to 45 to 55 percent solids on a dual-drum gravity belt thickener (BDP Industries).

For biosolids processing, the plant installed two auto-thermo-

*(continued)*



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Mark Stirewalt adjusts control panels for the AquaDisk cloth media disc filters (Aqua-Aerobic Systems) in the UV/filter building. (Champion R-Series compressor from Gardner Denver.)

philic aerobic digesters (ATAD), also from Evoqua. The ATAD process uses the metabolic heat released by microorganisms during digestion to kill pathogens in the material.

Lewis acknowledges there was a learning curve in adjusting to the new equipment. It took a few years to work the kinks out of the system, during which the plant reverted to its former aerobic digestion process to generate Class B biosolids. Since 2008, the ATAD process has been reliably delivering Class A material.

With two ATAD units available, the plant is prepared for fluctuat-

“If you have an upset and you get solids into your filters, within half an hour you can take a cloth filter offline, clean it up, and get it back online.”

**GREG LEWIS**

ing wastewater flows. Biosolids are typically fed into ATAD Reactor 1, but not often actually treated there. “We use that as a quasi storage,” Lewis explains. “We do most of our reacting in ATAD Reactor 2. We can do that because our flows really aren’t all that high.” They range from 0.4 to 0.45 mgd in summer to 0.6 to 0.65 in winter.

“We feed Reactor 1 daily,” Lewis says. “About once a week we take material out of Reactor 2 to post-ATAD storage.” The material is fed

into the ATAD system at about 5 percent solids. The ATADs reduce the volume by about 50 percent. Then the material is aerated and cooled down. Ammonia released in the process is vented through chemical and carbon scrubbers.

The digested material is then sent to a Sharpless dewatering centrifuge (Alfa Laval). The centrifuge runs about twice a week in lower-volume periods, a little more often when volume goes up. The machine typically produces material at 18-25 percent solids, about 22 percent on average. The centrate from the centrifuge is cycled back to the SBRs. Dewatered biosolids are stored in a concrete bunker until they can be tested and distributed to users.

The biggest challenge to the biosolids process has been dealing with grease from the community’s many restaurants. Food businesses are required to use and maintain grease traps, and most comply. “Where it’s a problem is when we have a septage hauler who pumps out a grease trap and tries to mix it with a septic tank load and sneak it by us,” Lewis says. That’s rare, but it does happen. Problems with some septage haulers led the facility to raise its rates for them and, as a result, fewer haulers now bring septage.

The ATAD system requires maintaining digester temperatures between 50 and 60 degrees C. “The problem with grease is it’s just too high a food source for an ATAD,” says Lewis. “It kicks into over-



Bryan Longe loads Class A biosolids at the Stowe facility.

load and you can't control the temperature." When the material heats up excessively, it causes odor problems. Lewis hopes at some point to retrofit the system with cooling coils, but for now, "We're not set up to do that."

#### FACING CONTROVERSY

In 2013, Stowe's land application permit was up for a routine renewal by the Vermont Agency of Natural Resources. The renewal was granted, but not

without a flurry of opposition from environmental activists. "It got pretty personal in the hearings," Lewis says. "I was called a polluter, a liar and a cheat." One outside critic reportedly complained to local officials that the town should have digesters — not knowing it already had them.

Lewis chalks it up to "the nature of the community" — Stowe's national high profile, he believes, draws outside opposition from organizations. In any case, the renewal was mainly a backstop. Although Stowe has a designated, town-owned farm where it can apply Class B biosolids, the community hasn't produced any since 2008. "Hopefully I'll never use it again," Lewis says.

Stowe will go on producing its Class A material as topsoil and landscaping material. Lewis boasts that unlike cow manure, the Stowe product does not contain weed seeds: The digestion process kills them. This means gardeners don't have to worry about seeding their flower and vegetable beds with weeds.

"It grows beautiful grass," Lewis says. "There's no weeds or anything growing up through it." **tpo**

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# Paint Me a Picture

A MAINE OPERATOR ASSOCIATION'S POSTER CONTEST CREATES GOODWILL AND GETS GREAT PUBLICITY DURING THE STATE'S OFFICIAL CLEAN WATER WEEK

By Ted J. Rulseh

Nothing calls attention to clean water like a picture in the paper — or a segment on TV — showing kids holding posters and posing with the governor.

At least that's how it looks to Matt Timberlake and members of the Maine Wastewater Control Association (MWWCA), which sponsors a poster contest each year during Maine Clean Water Week, the first full week of June.

"We typically do an awards presentation at the fall conference. In recent years, we've also asked the governor to be part of a presentation at the statehouse. The past four governors have accepted."

**MATT TIMBERLAKE**



From left, second-place winner Sophie Irons; first-place winner Nick Rocray, third-place winner Faith Ledger.

Timberlake, who runs the contest as the association's public relations chairman, calls it a way to go to state residents with a unified message about the importance of water and the clean-water profession. Last year's contest drew some 300 entries; with expanded eligibility and more promotion, Timberlake wants to see it get bigger in 2014.

"It has been a great way to promote our organization and the work our members do to keep Maine's waterways clean and safe," says Timberlake, a vice president with The Ted Berry Company, a municipal and industrial service company in Livermore. "Besides giving us name recognition, it engages the kids and gets them thinking about clean water. It's a fun program to be a part of."

## RECOGNIZING PROGRESS

The state legislature designated Maine Clean Water Week in 1983 to raise public awareness of improvements to state waterways, and a big reason for the improvements was the work of collection system and treatment plant personnel.

Maine has historic ties to water quality: A primary sponsor of the federal Clean Water Act of 1972 was Senator Ed Muskie of Rumford, Maine. "He grew up on the Androscoggin River, which at one time was on the Top 10 list of most polluted rivers in the country," Timberlake observes. The poster contest started in 1990 under the theme, "What Clean Water Means to ME." The theme had a double meaning, since ME is the postal abbreviation for Maine.

Winners of the 2013 MWWCA Clean Water Week poster contest all came from Angela Havens' sixth-grade class at Massabesic Middle School in East Waterboro. Pictured during an award presentation at the Maine statehouse are, from left, Matt Timberlake, MWWCA public relations chairman; third-place winner Faith Ledger; Aubrey Strause, MWWCA first vice president; second-place winner Sophie Irons; Governor Paul LePage; first-place winner Nick Rocray, and Tom Connolly, MWWCA second vice president.

"The contest is relatively simple," says Timberlake. "It's been open to students in grades three through eight. Every year, the students submit their posters, and the MWWCA executive committee judges them at the spring conference. We typically do an awards presentation at the fall conference. In recent years, we've also asked the governor to be part of a presentation at the statehouse. The past four governors have accepted."

First, second and third prizes were given, and the first-prize winner's school received a gift from the association, such as a microscope, a TV/VCR or cash. In addition, the top 12 posters were made into a calendar, distributed to treatment plants and schools around the state.

### CHANGING THE RULES

For 2014, the contest will be expanded, and a winner will be chosen in each of four divisions: grades one through three, four through six, seven through eight and nine through 12. Meanwhile, the nearly 50-year-old MWWCA will be known as the Maine Water Environment Association (MeWEA) beginning in April 2014.

The new theme is "Why Clean Water's Worth It to ME," a play on the theme of a Water Environment Federation awareness campaign embraced by the MWWCA and the New England Water Environment Association.

To promote the contest, the MWWCA sends letters and contest guidelines to every school in the state. This year the group is looking for a local celebrity spokesperson. In addition, Timberlake is challenging members to go farther by contacting their local schools personally.

Last year, a science teacher at Thomaston Middle School received the guidelines and asked Timberlake if an operator could visit his

classroom. "John Fancy from Thomaston and Mike Courtenay from Warren went out and did a presentation," Timberlake says. "The students loved it. We received about 30 posters from that school."

Timberlake made a visit of his own last year to his son's first-grade class at Central Maine Christian Academy in Lewiston. He "went a little rogue" and helped the younger kids make posters, even though first-graders weren't officially eligible. A third-grader from the same school had her poster chosen for the 2014 calendar.

### REAPING REWARDS

The MWWCA publicizes the winners by issuing a press release; the governor's office typically does the same. The releases usually are picked up statewide. Timberlake sees advantages in running the contest at the association level: It enables delivery of a consistent statewide message.

He sees signs the message is taking hold. At the 2013 awards presentation at the statehouse, he thanked first-place winner Nick Rocray, a sixth-grader from Waterboro, for taking time to create his poster.

Says Timberlake, "He told me, 'No, we should be thanking you and your association for all you do. You are the ones who keep the water clean. We just did the posters.' It was neat that he understood the work we do, because often we don't think anybody notices. If we can educate kids early, then hopefully they'll carry that knowledge for the rest of their lives. Maybe some will grow up to be operators." **tpo**

### What's Your Story?

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# The Secret to Wastewater Math

PUT THE CALCULATOR ASIDE FOR A MOMENT. LEARN HOW TO FACTOR *UNITS* INTO YOUR SOLUTIONS TO MATH PROBLEMS ON LICENSING EXAMS

By Steve Duerre

In my years as a wastewater operator trainer, I find that math is by far the most anxiety-producing topic for those preparing to take certification exams.

But why? For most wastewater math problems, all you need to do is add, subtract, multiply or divide. Everybody knows how to do that, right? Usually the problem is not with the actual math — it is with setting up the problem and picking out the right formula and the right *units*.

When us old timers were kids learning to do math, there was no such thing as a calculator — all we had were pencil and paper. So we had to write everything down. This gives us a big edge over whippersnappers who grew up with calculators, because they can’t plug *units* into the device. If you just punch numbers into a calculator, you’ll come up with an answer, but if you’re not careful, you won’t know if you stopped at the right point or whether you’re in the right *units*.

## A BETTER APPROACH

Here is how I suggest approaching wastewater math. Grab a pencil and a piece of paper and shove that calculator just out of reach. Set up your problem based on the *units*, and the *units* will tell you how to do the math — whether to multiply or divide.

For example, say you have a flow of 10 cubic feet per second and you want to know how many gallons per minute that is. First clue: Any time you see that word *per*, think *divide*. So you can write the problem out this way:

$$\frac{10 \text{ cubic feet}}{\text{second}} = \frac{X \text{ gallons}}{\text{minute}}$$

Now, how do you get from cubic feet per second to gallons per minute? Well, you can do math with *units* just like you do numbers. In this problem, there are two *units* to convert — cubic feet to gallons, and seconds to minutes. In each case you will use a conversion factor.

A basic principle of algebra is that if you divide something by itself in an equation, you cancel it out. For every conversion factor, there will be two associated *units*:

- The *unit* in the original problem that you want to cancel out.
- The *unit* you want to end up with in the answer.

You take the *unit* you want to cancel out and put in the formula wherever it works for canceling — either above or below the line that signifies division. Then you take the unit you want to end up with and put it on the opposite side of the line from where you put the first *unit*.

So, in our problem, let’s first deal with cubic feet and gallons: You want to cancel out cubic feet and be left with gallons. If you follow the procedure above, your problem now looks like this:

$$\frac{10 \text{ cubic feet}}{\text{second}} \times \frac{\text{gallons}}{\text{cubic foot}} = \frac{X \text{ gallons}}{\text{minute}}$$

Now notice that the *unit* “cubic feet” appears both above and below the line. You are dividing it by itself and therefore can cancel it in both places, as shown below.

$$\frac{10 \text{ cubic feet}}{\text{second}} \times \frac{\text{gallons}}{\text{cubic foot}} = \frac{X \text{ gallons}}{\text{minute}}$$

So you have cancelled out cubic feet and are left with gallons — but there is also a number associated with the conversion factor for going from cubic feet to gallons. You should receive a formula sheet with your exam that includes a table of conversion factors. Look down that table until you see something with gallons on one side of the equal sign and cubic feet on the other. You will see a number associated with one of those *units*. In this case, it is 7.48.

But do you multiply or divide by 7.48? Which *unit* did that 7.48 go with? In this case, there are 7.48 gallons per cubic foot, so you would multiply. And now your problem looks like this:

$$\frac{10 \text{ cubic feet}}{\text{second}} \times \frac{7.48 \text{ gallons}}{\text{cubic foot}} = \frac{X \text{ gallons}}{\text{minute}}$$

Don’t reach for that calculator yet. You still need to convert from gallons per second to gallons per minute. You won’t need your table of conversion factors to know to get there are 60 seconds per minute. So, follow the same procedure for *units* described earlier. Now your equation looks like this:

$$\frac{10 \text{ cubic feet}}{\text{second}} \times \frac{7.48 \text{ gallons}}{\text{cubic foot}} \times \frac{60 \text{ seconds}}{\text{minute}} = \frac{X \text{ gallons}}{\text{minute}}$$

Notice that now you have seconds both above and below the line — which means you can cancel it out. And your equation becomes:

$$\frac{10 \text{ cubic feet}}{\text{second}} \times \frac{7.48 \text{ gallons}}{\text{cubic foot}} \times \frac{60 \text{ seconds}}{\text{minute}} = \frac{X \text{ gallons}}{\text{minute}}$$

Now, pick up your calculator, do the multiplication, and you have your answer:

$$\frac{10 \text{ cubic feet}}{\text{second}} \times \frac{7.48 \text{ gallons}}{\text{cubic foot}} \times \frac{60 \text{ seconds}}{\text{minute}} = \frac{4,488 \text{ gallons}}{\text{minute}}$$

## THOSE OLD FRIENDS

So, do you see how setting up a formula to cancel out *units* will automatically tell you whether to punch the multiply or divide button on your calculator? Nowadays on the job you can set up spreadsheets to do almost all your math for you — but until you can bring your computer into the exam with you (not likely anytime soon), I suggest you bring the good old pencil and paper.

## ABOUT THE AUTHOR

Steve Duerre is a pollution control specialist with the Minnesota Pollution Control Agency. He can be reached at [steve.duerre@state.mn.us](mailto:steve.duerre@state.mn.us). tpo

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# BREAKING TRAIL

## KATIE GOIN AND HER TEAM WORK METHODICALLY TO UPGRADE THE WASTEWATER TREATMENT AND COLLECTION SYSTEM IN A SMALL COMMUNITY IN NORTHWEST WISCONSIN

By Scottie Dayton

FOR 52 YEARS, A CHEESE FACTORY EMPLOYED MANY RESIDENTS OF Cumberland, Wis. In 1953, the state Department of Natural Resources (DNR) required the rural community build a trickling filter wastewater treatment plant to handle the factory's high-strength waste.

A second mandate led to an upgrade to rotating biological contactors (RBC) in 1981. When the factory closed in 1991 and no longer provided revenue, the community's 2,200 residents faced rate increases to cover remaining debt.

In 2006, Katie Goin joined the plant as a Grade 4 wastewater operator and Grade 2 laboratory technician. Seven years later, the city council promoted her to plant manager. Despite inheriting a 32-year-old facility in need of many improvements, Goin and Grade 3 operators Randy Pedersen and Barry Bassett overcame many challenges, modernizing operations and improving facility performance.

Working with engineers, the team developed an asset management program, an operating budget and a master plan, then revised the collection system maintenance schedule to provide more frequent service, thus fewer issues and emergencies. In 2012, the Wisconsin Wastewater Operators Association named Goin Operator of the Year for the Northwest Region.

### STATE OF AFFAIRS

Beaver Dam Lake at the head of the Hay River nearly surrounds Cumberland's four square miles. The 400,000 gpd (design) plant uses four stages of RBCs in two trains to treat an average of 200,000 gpd. Effluent discharges to the river. The collection system has 23 miles of mostly 8-inch clay tile pipes, along with 15 lift stations, 500 manholes and four air release valves. Goin's team maintains everything.

Goin came to the community with experience at the 28 mgd (design) Marshfield Wastewater Treatment Plant, at a 1 mgd turkey-processing facility in Bar-



Katie Goin, plant manager at the Cumberland (Wis.) Wastewater Treatment Facility. (Photography by Cory Dellenbach)

ron and at other plants in Wisconsin. "I learned many different ways of doing things better," she says. "I'm trying to share that knowledge here."

She also came with an associate degree in applied science in water and wastewater from Vermilion Area Community College in Ely, Minn. She had previously earned a degree in parks and recreation from the same school, but realized seasonal work in that field would not help make her financially independent. In switching to the water side, "I had no idea what the subject was about, but it quickly became interesting and enjoyable," she says. "It's cool being responsible for multimillion-dollar facilities."

Wally Thom, water and wastewater manager for nearby Rice Lake Utilities, who nominated Goin for the award, says her diverse background makes her one of the best operators around: "I've seen Katie do more than operators with 25 years of experience." The improvements she has promoted at times have been "a hard sell," says Thom, because not all residents understand "that federal and state regulations drive everything in wastewater, not the person running the plant."

### LOOKING TO THE FUTURE

The city had operated without a wastewater budget, preferring to cover the previous year's expenses by raising sewer rates the following year, stressing many in a community with \$36,000 median household income. Plant maintenance was reactive; Goin has lobbied for a preventive approach, for the plant as well as for the lift stations.

A major force behind the change is a \$6.4 million upgrade to meet new discharge limits. Goin and her operators worked closely with engineers Bill Chang and John Stewart of MSA Professional Services to determine the best treatment process. While the RBCs met the discharge limits and worked well for the community, they were high maintenance. The team therefore selected an activated sludge process that, while more labor intensive, would be easier to maintain. Construction began earlier this year.



Goin was named the Wisconsin Wastewater Operators Association Operator of the Year for the Northwest District in 2012.



# profile

## **Katie Goin, Cumberland (Wis.) Wastewater Treatment Facility**

**POSITION:** Plant manager  
**EXPERIENCE:** 13 years  
**DUTIES:** Operate and maintain treatment plant and collection system  
**EDUCATION:** Associate degree, Applied Science, Water and Wastewater Technology, Vermilion Area Community College, Ely, Minn.  
**CERTIFICATIONS:** Grade 4 wastewater operator; Grade 2 laboratory technician  
**GOALS:** Upgrade the plant; educate the public  
**WEBSITE:** [www.cityofcumberland.net](http://www.cityofcumberland.net)  
**GPS COORDINATES:** Latitude: 45° 32' 00" N; longitude: 92° 01' 17" W

"I had no idea what the subject was about, but it quickly became interesting and enjoyable. It's cool being responsible for multimillion-dollar facilities."

**KATIE GOIN**

Katie Goin, shown with Randy Pedersen, operations specialist, has worked with her team to modernize a 32-year-old treatment plant along with the community's collection system.



## FAMILY AFFAIR

Darlene Wundrow and Katie Goin are mother and daughter wastewater operators. Wundrow operates a two-cell aerated lagoon system for the Village of Bruce, Wis., population 898. Goin manages the 400,000 gpd (design) Cumberland (Wis.) Wastewater Treatment Plant.

"Mom initially volunteered to cut weeds around headstones and mow grass in the cemetery," says Goin. "The village hired her to do that work, then kept adding jobs."

When the public works director left, Wundrow took over the position and earned her wastewater license, then Grade 2 certification.

"Mom used my college materials and scored 100 percent on tests," says Goin. "She also is a Grade 2 water operator and a heavy-equipment operator. When we get together, we talk wastewater. My sister absolutely hates it."

Wundrow was the 2010 Wisconsin Rural Water Association Operator of the Year.

Along the way, the city changed its street-paving procedure to include replacement of sewer mains in conjunction with road work. Previously, contractors sometimes had to dig up new asphalt and sidewalks to spot-repair sewers. Goin also advocated for accelerated collection system maintenance, changing the cycle from 20 years to five to seven years, as recommended by the DNR.

## RIPPLES OF CHANGE

Knowing her team needed a sewer cleaning truck, Goin sought quotes from three contractors to clean the pipelines, then found a 1999 Vactor 2100 unit. She compared its \$180,000 price tag with the bids and projected a two-year payback by doing the work in-house. "I had to sell the idea hard, because a jet-vac unit is new technology here," she says.

Pedersen operates the truck, which runs almost daily. Bassett operates the cleaning hose and Goin signals when the nozzle arrives in the downstream manhole. Massive root intrusion causes most backups and sanitary sewer overflows, and Goin aims to prevent them. "I cringe when customers report sewage in their homes," she says. "I don't want them getting sick. We had four



As plant manager in a small community, Goin has multiple duties that can include laboratory testing.

The team at the Cumberland Wastewater Treatment Facility includes, from left, Randy Pedersen, operations specialist; Katie Goin, plant manager; and Barry Bassett, lab technician.



SSOs during the first nine days of last August, and all but one was preventable. That hurts, because I take public safety and environmental risks to heart."

In 2013, Goin convinced the council to spend \$40,000 on a 2001 tracked ROVVER camera system (Envirosight), which she projected would pay for itself in three years. That year, the crew televised, root-cut, and cleaned 20 percent of the system. They notified homeowners who had huge root balls at the ends of their laterals, then referred them to contractors. "My goal was to clean 30 percent of the mains last year," she says. "Compared with cleaning 5 percent annually, we've made huge progress."

Goin's crew spends 80 percent of the time working in the collection system; the remainder at the plant. Besides their regular duties, Goin (a licensed heavy-equipment operator) and her team help the Streets Department with snow removal when needed.

Her optimistic attitude and passionate commitment to wastewater have impressed many professionals. "I talked to Katie's former supervisors and DNR engineer Pete Prusac," says Thom. "They gave her talents and abilities high praise, because she always does more than her job. Katie's a self-starter, and that's a rare quality."

#### GIANT STEPS

Goin is proudest of co-workers Pedersen, a former electrician, and Bassett, who has a bachelor's degree in biology (he previously kept fish alive in a hatchery using reverse osmosis and recycled water). "Randy is a natural when it comes to wastewater treatment," says Goin. "He always thinks outside the box and finds better ways to do the job." Several days after Bassett arrived, she put him in charge of the laboratory.

Although only Goin is required by law to be certified, both operators are working toward Grade 4 certification. "They are as committed to wastewater as I am," she says. "They're wonderful people and I can't imagine life without them."

Pedersen and Bassett offer support in many ways, including leaving candy on Goin's desk or "Be Happy!" notes when she returns from stressful meetings. "Katie interacts very well with her operators," says Thom. "She's a hands-on manager who gets as dirty as they do, and that's a big plus because everyone in this partnership is equal."

Goin's goal is to see the day the community views the wastewater profession as valuable and clean-water workers as assets. To educate customers, she has written newspaper articles about the plant and collection system and has proposed a web page and pamphlets. She plans to invite the community to watch the upgrade as it happens. "If that doesn't work, I'll educate their children," she says. "It's time to take charge and get the job done." tpo

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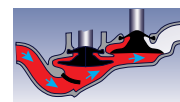
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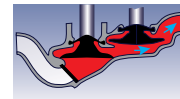


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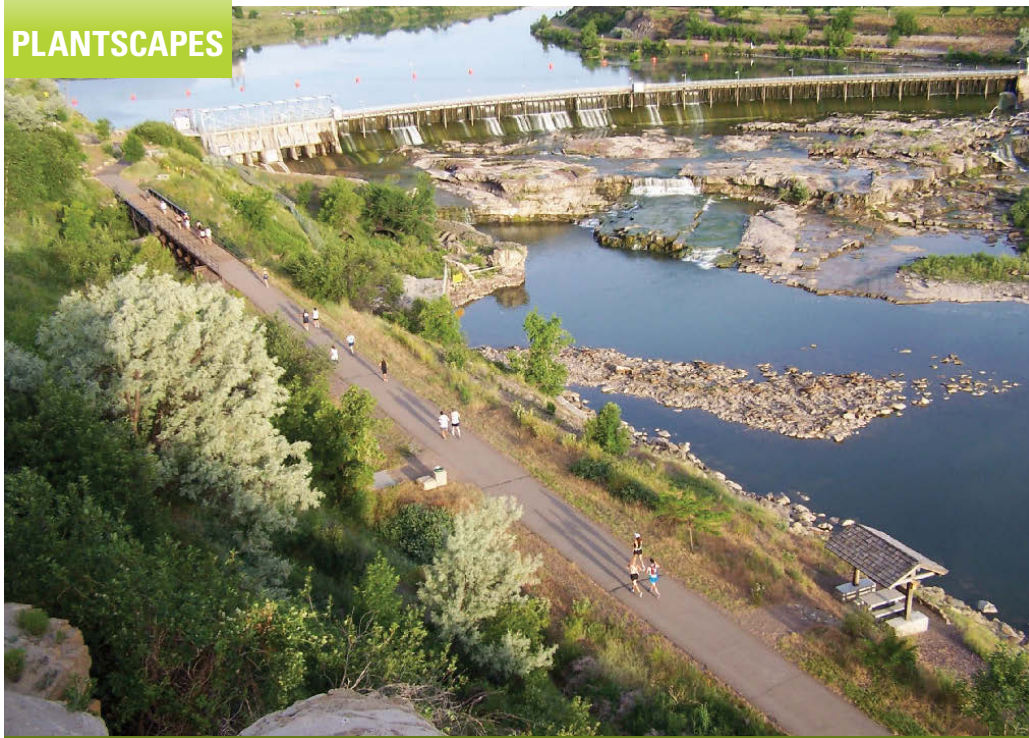


PHOTO BY WAYNE ROBBINS



PHOTO BY WAYNE ROBBINS



# Pitching Right In

PLANT TEAM MEMBERS IN GREAT FALLS, MONT., ARE PROUD OF THEIR CONTRIBUTIONS TO A TRAIL BUILT BY VOLUNTEERS ALONG THE MISSOURI RIVER

By Jeff Smith

Even though less than half a mile of a 50 mile public hiking/biking trail passes in front of the clean-water plant in Great Falls, Mont., that segment is a source of great pride and commitment to the plant operators and staff.

The River's Edge Trail, constructed on both sides of the Missouri River, is the product of efforts by community volunteer groups, the city, the PPL Montana electric utility, and other agencies and partners, says Wayne Robbins, plant manager. Plant operators and staff have been a notable part of the volunteer effort since the trail's inception in 1989.

Much of the trail is built on abandoned railroad and road rights-of-way and structures. Even before the segment in front of the plant was built, plant operators helped rebuild a 160-foot span of a trestle bridge that crosses wetlands on Sacagawea Island, downstream of the plant. "They volunteered every weekend all summer long and all during the fall with boom trucks and trailers," says Doug Wicks, president of Recreational Trails, a nonprofit group of community volunteers that planned and coordinated trail construction.

## BETTER BRIDGE

The original bridge was made of railroad ties, and the spaces between the ties made it unsuitable for hiking or biking. Robbins worked with Mike Jacobson, water/wastewater plant manager, Dana Audet, now assistant plant manager, and many other staff members to remove all the spikes and bolts, dismantle the trestle and re-deck the surface with additional ties. "That was a huge undertaking," says Robbins. "It was a big job, but part of our community service."

When it came time to build the trail segment that passes between the 21 mgd (design) activated sludge plant and the river, operators and staff relocated a chain-link security fence closer to the plant to accommodate the 10-foot-wide trail. Since then, they've paid for a trailside post-mounted sign that

describes the plant's processes. It was a part of the commemoration of 30 years of the city's operation and maintenance contract with Veolia Water, covering the treatment plant and 30 wastewater and stormwater lift stations.

describes the plant's processes. It was a part of the commemoration of 30 years of the city's operation and maintenance contract with Veolia Water, covering the treatment plant and 30 wastewater and stormwater lift stations.

## COLORFUL SIGN

The 4- by 8-foot sign is digitally printed with multicolored graphics and text that show and explain the flow of wastewater through the plant to its outflow at the river. The base is finished with textured stone-like panels. It was installed in 2007 after completion of an \$11 million improvement project for the plant's solids process. "I thought the sign would help the community understand what went on at the plant and what they were paying for," says Robbins.

Four years later, the sign was vandalized. The replacement graphic panels are made of high-pressure laminate overlaid on the original panel and fastened with security screws. "We paid to have it redone so that it's a lot more difficult to vandalize today," Robbins says.

Another trail feature is a water fountain in front of the plant supplied with potable water. "Because it's right in front of the plant, not everybody will stop for a drink," Robbins says. "We joke about it a lot, but I would drink from it."

## ATTRACTIVE LANDSCAPE

The trail segment in front of the plant looks like a park, with 45 trees, picnic tables and benches. Ivy grows on the chain-link security fence in front of the plant. The grass in the area is irrigated with water from the plant. "It really is an attractive area," says Jacobson.



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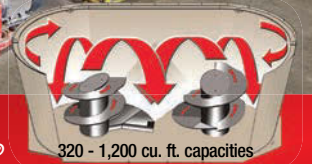


The staff at the Great Falls clean-water plant includes, from left, Keith Nelson, maintenance machinist technician II; Randy Kerkes, maintenance manager; Rock Rayl, maintenance instrumentation technician II; Dana Audet, assistant plant manager; Jonathan Carroll, laboratory technician; Rodney Lance and Gary VanTighem, operations and maintenance technician I; and Pat Darko, operations and maintenance technician II.

Robbins is proud of his staff's commitment to the plant's performance and to the community. They have won many awards, including regional and national U.S. EPA Excellence awards for operations. In addition, the plant has reached 12 consecutive months without a lost-time accident 27 times and is approaching 14 consecutive years without a lost-time accident.

Robbins says, "While we obviously take pride in the plant and effluent quality, we put staff safety above everything — with good results." **tpo**

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# Big Aspirations

OPERATORS AT A MISSOURI LAGOON TREATMENT SYSTEM MAINTAIN COMPLIANCE WHILE LOOKING TO PROGRESSIVE STEPS LIKE BIOSOLIDS LAND APPLICATION AND SOLAR ENERGY

By Trude Witham

Mike Letourneau, city engineer, stands beside the largest of Lincoln's three wastewater treatment lagoons. (Photography by Kris Wilson)

A man wearing a red jacket, blue jeans, and a cap stands on a concrete pier overlooking a large body of water. The background shows a clear blue sky and a line of trees on the far shore.

THE TOWN OF LINCOLN HAS BEEN DESCRIBED AS the “front door to Missouri’s great lakes,” Lake of the Ozarks and Truman Lake. It is a popular hunting and fishing area only a few hours from the major cities.

Despite its rural location and small population (1,000), the Missouri Department of Natural Resources required the town to put in a sewer system to protect Truman Lake. The system, with five lift stations and 13 miles of sewer line, was completed in 1998.

The town’s wastewater treatment plant, one of the few lagoon systems left in the state, does a stellar job of handling 33,000 gpd. Its two operators handle both water and wastewater treatment and do everything from dealing with I&I to helping replace 70,000 feet of wastewater lines and plowing town roads. They’ve also picked up a few awards from the Missouri Rural Water Association (MRWA).

“We maintain good records and keep the facility up to standards,” says Mike Letourneau, director of the Department of Public Works. “When we were nominated by our peers for 2012 Wastewater Treatment Facility of the Year, the MRWA people came to the plant and interviewed us, looked at our records, and went from there. We were surprised when we won.” Letourneau also received the MRWA’s 2008 Operator of the Year for his work on upgrading water mains and hydrants.

Letourneau and Dustin Koll, assistant DPW director, hold Class C wastewater and Level 3 water distribution system licenses and have been with the town for 12 years. Lincoln was their first water treatment job.

“Farm boys are hard to beat  
when you need someone  
you can count on.”

MIKE LETOURNEAU

Mike Letourneau checks the pH and dissolved oxygen levels in the overflow wet well between Lagoons 2 and 3 during a routine maintenance visit.



## ANNUAL FLY-IN

Operators at the Lincoln Wastewater Treatment Plant enjoy the town's annual fly-in. Held the second Saturday in September, the event features food and door prizes. Participants can drive or fly in; the typical 400 to 600 attendees include about 100 pilots.

"I'm on the board of directors for the airport, so I am involved in the fly-in," says Mike Letourneau, Public Works director, who holds a private Visual Flight Rules (VFR) pilot license. Dustin Koll, assistant Public Works director, helps set everything up and prepares and serves the food.

Donations for the food help the town make improvements to the airport as required by the Federal Aviation Administration. Lincoln's is one of the few grass field airports remaining in Missouri.

# profile

## Lincoln (Mo.) Wastewater Treatment Plant

<b>BUILT:</b>	<b>1998</b>
<b>POPULATION SERVED:</b>	<b>1,000</b>
<b>EMPLOYEES:</b>	<b>2</b>
<b>FLOW:</b>	<b>33,000 gpd average</b>
<b>TREATMENT LEVEL:</b>	<b>Primary</b>
<b>TREATMENT PROCESS:</b>	<b>Lagoon, chlorination</b>
<b>RECEIVING WATER:</b>	<b>Tributary to Little Tebo Creek</b>
<b>BIOSOLIDS:</b>	<b>None</b>
<b>ANNUAL BUDGET:</b>	<b>\$222,000</b>
<b>WEBSITE:</b>	<b><a href="http://www.lincolnmissouri.com">www.lincolnmissouri.com</a></b>
<b>GPS COORDINATES:</b>	<b>Latitude: 38°24'08.02" N; Longitude: 93°20'47.65" W</b>



### FARM TO LAGOON

Raised on a farm, Koll started working at the Lincoln plant during summers and was hired full-time when he graduated from high school. "It sounded like a good job and was something I had never done before," he says. He learned by doing, with help from Letourneau, who observes, "Farm boys are hard to beat when you need someone you can count on." Koll still helps his dad on the family's 200-acre cattle farm.

Letourneau started with the town as an engineer. Before that, he owned a construction firm in Houston, Texas, that did water plant construction. "As town engineer, I was responsible for drinking water and wastewater opera-

tion, building inspection and street maintenance, and was also the airport manager and dog catcher," he recalls.

Letourneau and Koll spend most of their time maintaining the plant's lagoon system, which consists of three cells that cover 7.0, 22.9 and 1.3 acres. The system holds 24 million gallons and typically discharges 33,000 to 133,000 gpd, depending on weather conditions. "We're in a drought now, so we're discharging 33,000 per day," says Letourneau. Discharge is to a tributary of Little Tebo Creek, which winds eight miles to Truman Lake.

"The town is supportive and interested in what we do. Most anytime I ask for something, I pretty much get it, but I'd better have it spelled out because it's the town's money.

### MIKE LETOURNEAU

The operators check the lagoons first thing in the morning, then inspect the lift stations and water wells. They draw wastewater samples and send them to an outside lab for analysis for BOD, TSS, pH, ammonia nitrogen, fecal coliform, oil and grease. The plant permit is getting stricter. "We installed a chlorination/dechlorination system in summer 2013 to meet regulations, and although we are not exceeding the limits now, the state is also requiring us to reduce our effluent ammonia nitrogen," says Letourneau.

The plant doesn't have to worry about biosolids. "We perform sludge





Dustin Koll, assistant public works director, prepares to add more rip-rap along the shoreline of the lagoons.

### Lincoln (Mo.) Wastewater Treatment Plant PERMIT AND PERFORMANCE

	PERMIT Monthly Average	EFFLUENT 2012 Average
<b>BOD</b>	45 mg/L	34.7 mg/L
<b>TSS</b>	70 mg/L	55.8 mg/L
<b>Ammonia N</b>	May 1-Oct. 31: 1.4 mg/L Nov. 1-Apr. 30: 2.9 mg/L	0.22 mg/L 0.22 mg/L
<b>Fecal coliform</b>	400/100 mL	210/100 mL

tests in cell 1 to determine the biosolids level, which is around eight inches,” says Letourneau. “Usually in August, the level gets to the point where we need to add enzymes to eat the organic waste.” Future plans include a land application system to save on chemicals and maintenance and lower electrical costs. “By 2016 we should be in compliance with Missouri Clean Water Commission regulations and Federal Water Pollution Control Act regulations to land-apply,” says Letourneau.

The operators’ greatest challenge is I&I during heavy rains. “In the past, our discharges have come close to exceeding the permit limitations,” says Koll. “There is always the act of God and you can’t control that.”

#### SUPPORTIVE TOWN

Letourneau and Koll are involved in replacing the town’s 13 miles of sewers. “They were made out of clay, and we’re putting in plastic ones,” says Letourneau. “We contract it out, since we don’t have the equipment, but we help with the work.” Each year, 400 to 800 feet are replaced; 7,500 feet have been completed so far.

“The town is supportive and interested in what we do,” Letourneau says. “Most anytime I ask for something, I pretty much get it, but I’d better have it spelled out because it’s the town’s money. Right now, we’re trying to get a ground-based solar power system for our lift stations. Our council members are in favor of adding it and getting away from using fossil fuel. We’d like to be as green as possible.”

The total cost will be \$80,000; a rebate from local utility KCP&L will cover the first \$50,000. Letourneau estimates that solar systems at two lift stations will save \$1,000 per month on electricity costs. The town will also get renewable energy credits if the solar systems produce more energy than the lift stations use.

“We can save \$30,000 to \$40,000 on each system by doing the installation ourselves,” Letourneau says. “We’re trying to meet a July 2014 deadline, so we can then concentrate on the land application system to meet 2016 needs.”

#### GETTING HELP

Letourneau and Koll call on the MRWA for assistance. “If we have a problem, they send people out to help, and we also return the favor,” says Letourneau.



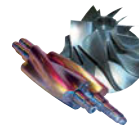
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Dustin Koll's farming background prepared him with many of the skills and the work ethic needed to be effective in the clean-water profession.

"We're like brothers and sisters — one big happy family, which is rare these days." They keep up their continuing education credits by taking classes through MRWA and the state Department of Natural Resources. The U.S. EPA funds many of the classes.

The two operators agree that the best part of the job is talking to the public. "They're pretty informed," says Letourneau. "The older folks tell you the way things were done in the past, and the younger ones tell you how you ought to do things. I listen to them, and we try to combine the old technologies with modern ones."

Working in a small community means being on call for emergencies. Letourneau and Koll are sometimes called out in the middle of the night to deal with sewer backups. "It's usually caused when homeowners accidentally put products down the sewer lines that don't belong there, or from bad connections from their lines to the mains," Letourneau says. The operators clear lines with the town's trailer-mounted water jetter, which operates at more than 2,500 psi.

"Our greatest satisfaction is the response we get from local citizens on how well we have done, and the occasional pat on the back. It matters."

**MIKE LETOURNEAU**

One emergency came on Christmas Eve 2012 when a lift station pump malfunctioned. "We had to use one of our two portable pumps to pump uphill to a manhole, and then repair the lift station pump so it would be back online on Christmas Day," Letourneau says. Winter duties include snow plowing: "Twenty-four inches of snow doesn't bother us here, and in fact everyone compliments us on the great job we do. When we got 24 inches in 2011, Dusty and I worked 36 hours straight to clear the roads."

### LABOR OF LOVE

As someone whose career has been with a small water system, Letourneau offers encouragement to others like him: "The job often doesn't pay much, but keep working with your council to help you out. You're not getting rich, but it's more a labor of love."

He points out that while operators may make more in bigger cities, it costs more to live there. "It really depends on the type of life you want," he says. "For night life, go to the city. For a more laid-back life, go to the smaller towns. Our greatest satisfaction is the response we get from local citizens on how well we have done, and the occasional pat on the back. It matters."

Koll agrees: "I'm so glad I chose the water field. Great work, great people!"

**tpo**



Mike Letourneau checks the voltage at a lift station next to two subterranean grinder pumps. The lift station sends wastewater three miles to the treatment site.

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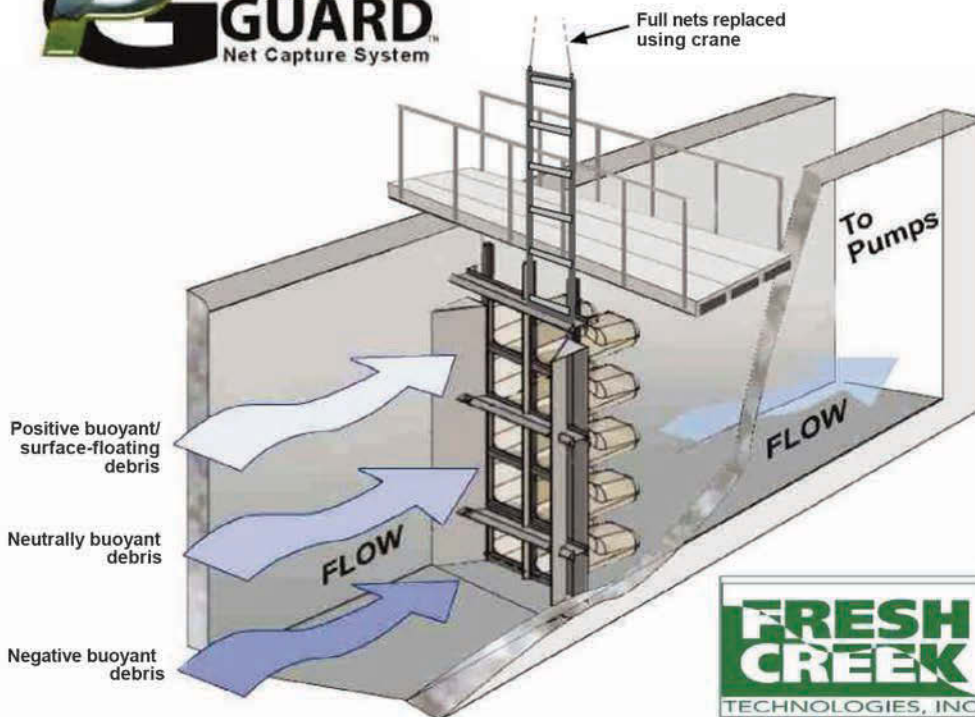
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Pittsfield combined heat and power building.  
(Photos by David Lamb Photography)

# Good Timing

ENERGY EFFICIENCY PLANS LINED UP WITH A 2009 FEDERAL GOVERNMENT ECONOMIC STIMULUS PROGRAM TO BRING A MASSACHUSETTS PLANT CLOSE TO NET NEUTRAL ENERGY

By Doug Day

**I**t was a happy coincidence. As officials in Pittsfield, Mass., were working on an ambitious energy efficiency plan for the wastewater treatment plant, the federal government came up with a plan to distribute about \$830 billion to stimulate the economy. The plant tapped into some of that money for an upgrade that will reduce the use of purchased energy by at least 90 percent.

Wastewater treatment has a history of being “off the grid” in Pittsfield since the original plant was built in 1902. With no natural gas service, the plant generated its own power through a combination of No. 2 heating fuel and biogas as it grew, according to Carl Shaw, plant superintendent.

That ended with an expansion in 1976 when the on-site generators were turned off and used only for backup power. Electricity bills rose as the plant (17 mgd design flow, 12 mgd average) went through improvements to better serve the 50,000 residents of Pittsfield and a few nearby towns.



Aeration basins at the Pittsfield treatment facility now use 150 kW turbo blowers (HSI Blowers) and fine-bubble aeration (Sanitaire).

Seeking to reduce costs in 2009, the city began planning a series of energy projects. In that same year, the American Recovery and Reinvestment Act (economic stimulus program) came along, with more than \$13.5 million to pay for three projects completed in 2010-11:

- \$2.5 million for a new combined heat and power (CHP) system
- \$3 million for an update to the aeration system
- \$8 million for a photovoltaic energy plant

“We were already engineering these projects before the money was offered,” says Shaw. Upon completion of the work, annual energy spending dropped from about \$800,000 a year to about \$500,000, even though the CHP system isn’t yet running at full capacity.

## USING THE GAS

“A lot of the biogas we were making was just being flared,” says Shaw. “The only thing we used it for was heating in winter.” That changed with the CHP system, which includes three 65 kW microturbines (Capstone), purchased from design-build contractor CalPower and installed by BioSpark. “We now have the capacity to handle 120,000 cubic feet of methane per day,” says Shaw. That provides room for growth, as daily biogas production runs from 60,000 to 80,000 cubic feet.

CHP output has been limited since the system went online, but that is beginning to change. “We put in a new transformer and a small motor control center [MCC] for some of the upgrades,” explains Shaw. “It wasn’t until we started hooking up new equipment to the old MCC that we realized the system was way overloaded.” A new MCC being installed this year should increase annual electricity savings to about \$150,000.

Waste heat from the microturbines is also captured to maintain the two anaerobic digesters at 95 to 100 degrees F. “That should heat the digesters for at least six months of the year,” Shaw says. Biogas also fuels a boiler for winter building heat, displacing expensive No. 2 heating fuel. A new SCADA system controls the process: the emphasis is on generating electricity in summer and heat in winter.

## AERATION EFFICIENCIES

On the liquid side, a fine-bubble aeration system (Sanitaire) cut energy use for that process in half. Two old mechanical aerators had only two speeds, and a third was used only when necessary because

it had a single-speed blower. “If the dissolved oxygen dropped to 2 mg/L, the aerators would kick to high,” says Shaw. “Once the DO got above 4 mg/L, they would kick into low. It was a simple system to run, but there was no control over it, and it used a lot of energy.”

The three 45 hp blowers were replaced with three 150 kW turbo blowers (HSI Blowers) and an 800 kW engine (Caterpillar). “Even in the dead of summer with low flows and the highest oxygen demand, we’re only running one blower,” Shaw says. The system was overbuilt to make sure there was enough capacity to support denitrification in the future.

### SOLAR POWER

Looking to generate more energy, and with plenty of available land, the Pittsfield team decided to install a 1.58 MW fixed solar photovoltaic array (Nexamp). The 7,500 solar panels in the 5-acre system save the plant about \$200,000 a year. “We sell the energy and get green and renewable energy credits,” says Shaw.

While the solar plant is not directly connected to the plant, it still serves the facility’s electrical needs. It connects to the grid just upstream from the treatment plant’s incoming power lines through a net metering agreement with Western Massachusetts Electric Company. The utility wanted it designed that way so that the company can access the electrical output if the plant doesn’t need it.

### SAVINGS DOCUMENTED

The solar and aeration projects have already proven themselves in saving energy. CHP savings will continue to improve this year and into the future.

### Estimated electrical energy usage (MWh/yr)

<b>Historic average utility electricity usage</b>	<b>4,446</b>
Generated by CHP (when new MCC is complete)	(1,572)
Reduced by aeration efficiency	( 919)
Generated by photovoltaic system	(1,500)
<b>Subtotal generated and reduced</b>	<b>(3,991)</b>
<b>Theoretical net utility electricity usage</b>	<b>455</b>
<b>Overall reduction</b>	<b>90%</b>

As part of the new CHP motor control center, two 750 kW diesel engine-generators (Caterpillar) are being added for emergency power during outages. That will also allow the plant to enroll in the local electric utility’s load management program. By agreeing to shut off utility power to the plant during times of high demand on the grid, the plant gets incentive payments from the utility.

“When the utility calls us, we’ll be going off the grid,” explains Shaw. “Right now, we can’t run the full facility on emergency power, so we’ll have to go into emergency bypass power mode and change some operations. When the MCC is complete, we’ll be able to operate the same way all the time, whether or not power is available from the grid.”

For now, those generators will run off No. 2 heating fuel, but Shaw is exploring extending natural gas service to the plant and converting the generators, thus increasing the economic benefit by using a less expensive fuel.

### BRIGHT FUTURE

Shaw says a fourth microturbine is a possibility, based on optimizing the digesters to produce more methane. Accepting high-BOD waste is being explored as a way to increase biogas volume. Shaw is also considering an inline hydroturbine for the plant’s outflow pipe to the Housatonic River.

## FROM COMPUTERS TO CLEAN WATER

Carl Shaw was about to finish his associate degree in computer science when life took an odd turn. While superintendent of the Pittsfield wastewater treatment plant was not the career he planned, he’s happy helping keep the environment clean and serving the public. He was just six credits shy of the degree at Berkshire Community College when doing real computer work convinced him he was in the wrong field.

“I was doing data entry and programming, sitting in an office every day, and I hated my job,” he says. “I was contemplating how to explain to my father that I didn’t want to do this for a living.”

Then came an offhand remark from Paula Ely, a friend of his wife, Liza. Ely happened to be a lab technician at the Pittsfield plant and suggested Shaw become a wastewater operator.

“I didn’t know what wastewater was, I didn’t even know this plant existed, and I had lived here my entire life,” Shaw recalls. Liza talked him into touring the plant, and he found it interesting. He had always liked technology, chemistry and biology. So, rather than finish the course work for his degree, he went out and got his wastewater operator license. He was hired at the plant in 1996.

“I started as an operator,” he recalls. “I just fell in love with it. Eighteen months later they promoted me to shift supervisor.” He became chief operator in January 2010 and plant superintendent in February 2013.

“I love my job and look forward to coming to work every day,” he says. “It fascinates me.” While he’d like to finish his computer science degree, his real passion now is clean water.

“The public really needs to know what goes on down here,” he says. “They don’t realize what a gem we have, what happens with water when it leaves their home, and what’s involved in cleaning it up. You can’t get more green than a wastewater treatment plant.”



The combined heat and power system uses three 65 kW Capstone microturbines.

At the same time, he sees energy demand increasing with the EPA-required addition of about \$40 million in phosphorous and aluminum removal technology. So energy efficiency will remain a concern. **tpo**

### 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](mailto:editor@tpomag.com) or call 715/277-4094.**

# Names Do Matter

CLEAN WATER SERVICES IN OREGON SEES SIGNIFICANT AND TANGIBLE BENEFITS FROM NAMING ITSELF FOR THE END PRODUCT, RATHER THAN THE RAW MATERIAL

By Ted J. Rulseh

The agency in Oregon now called Clean Water Services was born in 1970 as the Unified Sewerage Agency (USA).

The name fit. In 1970, residents voted to unify more than 20 wastewater treatment plants operated by more than a dozen cities and private developments, creating one of the nation's first regional sewer utilities. Unfortunately, the name didn't resonate with people and, as the USA expanded its role in protecting water resources, the name no longer reflected all the agency did.

So, in 2001, USA became Clean Water Services (CWS). The impact of the change was significant and tangible, according to Mark Jockers, government and public affairs manager. The name alone had a substantial effect on public awareness of the agency and its mission and on customer satisfaction with its performance.

Jockers talked about the reason behind the name change and the benefits that grew from it in an interview with *Treatment Plant Operator*.

**tpo:** In brief, what is the history of your agency?

**Jockers:** In the late 1960s, there were 26 wastewater treatment plants in Washington County, operated by cities, private development groups and a mishmash of organizations, and they were not operating very effectively. The

“From a communication standpoint, it’s fundamentally flawed to define your business based on your raw material. We wanted to define our business based on what we produced.”

**MARK JOCKERS**

state stepped in and imposed a building moratorium until the county could pull its act together in terms of handling wastewater. That led to a vote among county residents in 1970 to unify all the sewerage agencies into one organization. The Unified Sewerage Agency was voted into existence by a two-to-one margin in February 1970.

**tpo:** How did the new agency go about consolidating treatment in the county?

**Jockers:** We took 24 of the 26 treatment plants offline and built two regional facilities to bring a higher level of treatment to bear. We also built the trunk lines, the pump stations and other ancillary facilities. We spent the 1970s building the infrastructure and bringing the collection and treatment systems up to a standard. Most of that was done by 1980.

**tpo:** Did the agency’s responsibilities extend beyond wastewater treatment?

**Jockers:** Yes. As we moved into the 1980s, there was an increased focus on the impact of urban runoff. In 1990 we worked with our 12 member cities



Mark Jockers, government and public affairs manager, Clean Water Services.

to start a stormwater utility to address urban nonpoint pollution. In addition, in the late 1990s, there was an Endangered Species Act listing for winter steelhead in the rivers. At the request of the cities, we took on Endangered Species Act response planning. We also began working with municipal and industrial water providers and agricultural irrigators to coordinate integrated water resource planning to determine how best to meet and balance the sometimes competing demands for water in the basin.

**tpo:** What was the original impetus behind the name change to Clean Water Services?

**Jockers:** At the end of the 1990s, it was clear that we were doing much more than sewage treatment. We were really a watershed organization. And from a communication standpoint, it's fundamentally flawed to define your business based on your raw material. We wanted to define our business based on what we produced. Utilities like ours don't have big marketing budgets or advertising budgets — our most important marketing tool is our name. That name should communicate what we do and what we care about, and that is clean water.

**tpo:** How did you go about the process of making the name change?

**Jockers:** We went through a very deliberative process that took a year and a half. It started with conversations with our board of directors, our management team and our employees, talking about what we did and what we

(continued)

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cared about, and how we wanted people to see us in five years or 10 years.

From these conversations, we established a name change framework to guide the development of more appropriate brand. We hired a local marketing consultant and graphic artist to help us look at options for names and various design treatments. We took that back to our board and management to narrow the list. When we got to the final three, we did focus groups with customers, asking, “Do you understand what this means? How do you react to this name?”

**tpo:** What were some of the alternate names that were considered?

**Jockers:** They included Watershed Services, Watershed Resources, and Clean Water Resources, in addition to Clean Water Services. We didn’t find any fatal flaws in those names, although there was certainly a stronger preference for “clean water.” Our board made the final decision in favor of Clean Water Services. We changed the name to coincide with the start of our fiscal year on July 1, 2001.

**tpo:** What needed to be done to implement the name change?

**Jockers:** In the year and a half leading up to the change, we did an inventory of every place our name showed up. We stopped ordering letterhead, we stopped printing new brochures, we stopped ordering new business cards, all so that we could make the change within our existing replacement cycles and minimize the cost.

Some things were changed over time. For example, our fleet includes 73 vehicles, ranging from backhoes to pickup trucks. We gradually phased in the new identifiers on the sides of those vehicles. We also developed a set of name usage and design standards — how the name and logo were to be presented on signs, on vehicles, on letterhead, in email signatures and in other forms of communication.

**tpo:** How long did it take for the name and visual identity to be fully phased in?

**Jockers:** I would say that within a year or two, most of the old identity had been washed out. We did have a handful of long-time operators who took pride in the old name — some people walked around for years in overalls and hats that said Unified Sewerage Agency.

**tpo:** What did you observe about the effect of the name change on public perceptions of your agency?

**Jockers:** We had been the Unified Sewerage Agency for 31 years, and we served 430,000 people, yet our name recognition was very low. Relatively few people knew who we were or what we did. Our name recognition was hovering around 30 percent, based on our Customer Service and Satisfaction Surveys, which we have done every two years since 1988. Today, based on our latest survey in 2012, Clean Water Services has close to 80 percent name recognition among our customers. They don’t necessarily know in detail what we do, but they are aware of us and, more important, believe we do a good job and have a positive impact on the community.

**tpo:** Is that improvement solely the result of the name change? Or were other factors involved?

**Jockers:** With the name change, we did start a more aggressive public service campaign. Our stormwater permit includes a requirement to do public education related to people’s impact on water resources. So as part of that education campaign, we certainly got our name out there more than before.

But I also think the name Clean Water Services simply resonates better than Unified Sewerage Agency. Within five years of becoming CWS, we documented through our surveys that we had established a very distinct positive identity with our customers. Within those five years, we found 78 percent of our customers believed that CWS was doing a good to excellent job — a significantly higher rating than USA ever received in its 31-year history. We were still the water treatment provider, still taking used water, treating it and put-

ting it back into the river, but now our customers had a very different perception of our role in the community.

**tpo:** What other positive outcomes did you see from the name change?

**Jockers:** The name change has helped us in terms of partnering. We do a lot of partnering in the agricultural community, and when Clean Water Services reaches out to the Soil and Water Conservation District, it’s an easier initial phone call than if we were the Unified Sewerage Agency.

The same is true in our partnering with community groups and nonprofits. Over the past several years, we have planted more than 700,000 trees and shrubs and restored close to 50 miles of stream bank. A lot of that has been

“Our name recognition was hovering around 30 percent, based on our Customer Service and Satisfaction Surveys. ... Today, based on our latest survey in 2012, Clean Water Services has close to 80 percent name recognition among our customers.”

**MARK JOCKERS**

done through relationships with nonprofit groups. It’s been easier to initiate those conversations because our name says clean water and people know what we care about.

**tpo:** What about internally? Would you say the name helped instill a greater sense of pride among employees?

**Jockers:** At first some people were hesitant, but within a short time, for the most part, people did hold their heads up higher. When neighbors talked over the fence and asked, “Where do you work?” people were proud to say, “Clean Water Services.” Whereas if they said “Unified Sewerage Agency,” there was a need for lots of explanation of what they actually did. And sometimes the other person’s initial reaction was, “Yuck!”

**tpo:** Does the name help people more appreciate the full breadth of your agency’s services?

**Jockers:** It does help communicate a broader set of competencies than did the old name. Increasingly, our business is about resource recovery. Our treatment plants are really factories that take in used water and produce three products.

They produce clean water that either goes to the river or is used for irrigation. They are also producing energy — through cogeneration with biogas we currently meet about 20 to 25 percent of our treatment plant energy needs, and a new cogeneration project coming online this year at our Durham plant will boost that to almost 50 percent for that facility.

Then there’s nutrient recovery. We do land application of biosolids, and we have more demand than supply. In 2008 at our Durham plant, we installed the first commercial nutrient recovery facility in North America with Ostara. In 2011, we installed a similar project at our Rock Creek plant that at the time was the largest in the world. When fully operational, those facilities will produce about 2,000 tons per year of a slow-release commercial fertilizer called Crystal Green, which Ostara purchases from us.

In 2012 we also launched a residential blend fertilizer called Clean Water GROW, sold in garden stores. It’s an all-purpose, full-blend plant food that contains about one-third Crystal Green and two-thirds other nutrients.

**tpo:** What would you say to leaders of other clean-water utilities that might be pondering changing to more positive agency names or plant names?

**Jockers:** Our industry needs to think hard on how we talk about what we do. Especially given the number of regulations and demands being put on us it’s more important than ever for people to understand what we do, and it’s more important than ever for us to push innovation and partnerships as we deliver our services. **tpo**



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High Pressure	Metering	Peristaltic	Piston/Plunger	Progressive Cavity	Pump Alignment/ Vibration	Pump Controls	Pump Parts/ Components	Pump Repair/ Service	Rotary Lobe	Solids/Sludge	Submersible	Vertical/ Lift Station	Other
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YES



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PO Box 70, Grand Island, NY 14072  
888-829-2783 201-445-2882 Fax: 888-883-3320  
info@wastecorp.com www.wastecorp.com

YES

YES

YES

YES

YES



**Watson-Marlow Pumps Group**  
37 Upton Technology Park, Wilmington, MA 01887  
800-282-8823 978-658-6168 Fax: 978-658-0041  
support@wmpg.us www.wmpg.com



**Waukesha Cherry-Burrell, An SPX Brand**  
611 Sugar Creek Rd., Delavan, WI 53115  
800-252-5200 262-728-1900 Fax: 262-728-4904  
ft.amer.info@spx.com www.spxft.com

YES



**Weir Specialty Pumps (WEMCO)**  
440 West 800 South, Salt Lake City, UT 84101  
800-716-5050 801-359-8731  
wsprfq@weirgroup.com www.weirpowerindustrial.com

YES

YES

YES

YES



**Yaskawa America, Inc.**  
2121 Norman Dr. S, Waukegan, IL 60085  
800-927-5292 847-887-7000 847-887-7310  
marcom@yaskawa.com www.yaskawa.com



**Zoeller Company**  
3649 Cane Run Rd., Louisville, KY 40211  
800-928-7867 502-778-7867 502-774-3624  
info@zoeller.com www.zoeller.com

YES

YES

YES

High Pressure	Metering	Peristaltic	Piston/Plunger	Progressive Cavity	Pump Alignment/ Vibration	Pump Controls	Pump Parts/ Components	Pump Repair/ Service	Rotary Lobe	Solids/Sludge	Submersible	Vertical/ Lift Station	Other
					YES								
	YES		YES		YES					YES		YES	
					YES	YES	YES			YES		YES	Grit
YES	YES		YES		YES	YES	YES	YES	YES	YES	YES		Positive Displacement
YES					YES	YES	YES				YES	YES	
YES		YES		YES			YES			YES	YES		
										YES	YES	YES	
			YES	YES	YES	YES	YES	YES	YES	YES		YES	
	YES	YES											
				YES					YES				Positive Displacement
							YES	YES		YES	YES	YES	Self-Priming
					YES								
			YES		YES					YES	YES	YES	



An overview of the Allenstown treatment plant. The small building on the right was the only plant addition needed to double capacity by way of the BioMag System.

# Speedy Settling

MAGNETITE ADDITION IS PART OF A CLARIFICATION SYSTEM THAT HELPS A NEW HAMPSHIRE PLANT DEAL WITH WET-WEATHER FLOWS AND ACHIEVE COMPLETE NITRIFICATION

By Dana Clement and Robert Backman

A new ballasted biological treatment process has helped the Allenstown (N.H.) Wastewater Treatment Plant expand capacity in response to orders from state regulators who had placed a moratorium on new sewer hookups.

The lower cost of the new process enabled the plant to make the improvements in the first place, since ratepayers had voted down previous bonding proposals to expand the facility. The new technology also allows the plant to achieve complete nitrification.

The Allenstown facility serves two municipalities with a combined population of 15,000. The original plant was designed 30 years ago as an extended aeration activated sludge process with 1.05 mgd capacity. However, it has always operated as a conventional activated sludge process without primary clarifiers. Raw wastewater passes through a headworks, aeration, clarification and chlorine disinfection.

The plant team includes Jeffrey Backman, chief operator/assistant superintendent; Richard Slager and Marc Lee, operators; Russel Smock, maintenance manager; Christopher Robinson, operations and maintenance assistant; Andrea Martel, administrative assistant; and Alyson King, office assistant.



Testing documents the settleability of the mixed liquor suspended solids. The beaker on the left demonstrates the rapid settleability with the BioMag System.

The mixed liquor suspended solids concentration increases without risk of upset, and the clarifier easily handles the increased solids loading rate. As a result, operators gain more control over sludge blankets, especially during storms, and tank capacity can be freed up for nutrient removal.

## BEYOND CAPACITY

Although the communities' sewers are not combined, I&I was contributing to serious wet-weather capacity issues. The state Department of Environmental Services in 2005 found that the plant was exceeding capacity and placed a moratorium on sewer connections.

The utility sought design recommendations from consultant Hoyle, Tanner Associates (HTA). The firm proposed a comprehensive plant upgrade including sequencing batch reactors, but voters twice rejected a proposed bond issue because of the project's high

cost. Essentially, ratepayers said they were not willing to spend a nickel on the expansion.

Unable to get voters to approve a full plant upgrade, the sewer commission asked HTA to find a Plan B. The firm recommended installing the BioMag ballasted biological treatment system from Evoqua Water Technologies (formerly Siemens Water Technologies).

Even though it cost one-tenth of the earlier proposal, voters again said no. Eventually, the commission worked out a funding plan, using revenue from the plant's treatment of statewide septage along



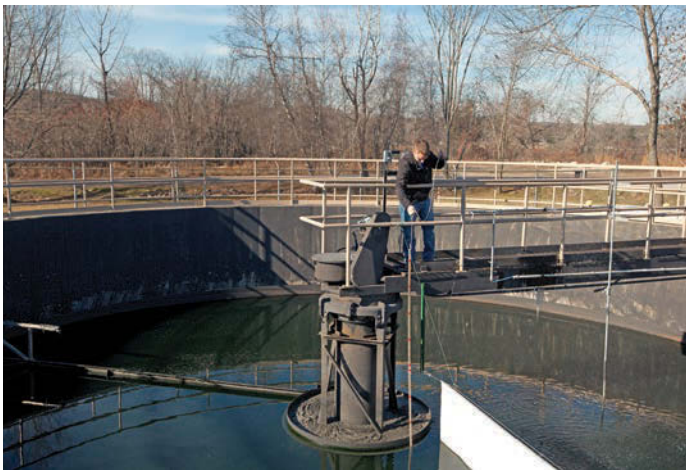
with federal funds from the American Recovery and Reinvestment Act (ARRA), funneled through the New Hampshire State Revolving Loan Fund.

Since 2005, septage treatment fees had added enough to the utility's capital reserves to support half of the \$1.6 million project. Fifty percent principal forgiveness allowed by the state from ARRA funding enabled the project to be done at no cost to ratepayers or taxpayers, who then approved the project.

### BALLASTED PROCESS

The BioMag System adds magnetite to conventional biological floc to make it heavier, dramatically improving settling rates and increasing secondary biological clarifier performance without the addition of capital-intensive new tankage. It has proven effective where clarifiers are the choke point in wastewater treatment plants.

The magnetite is stored on site, then blended into a sidestream of waste activated sludge (WAS) and fed directly into the bioreactor, where it is gently mixed and fully infused with the contents. As the specific gravity of the floc increases, biological solids settle faster and more reliably, resulting in extremely low clarifier sludge blankets.



An operator measures the sludge blanket depth in a clarifier. The picture shows no visible signs of sludge buildup or scum in the clarifier.

The mixed liquor suspended solids concentration increases without risk of upset, and the clarifier easily handles the increased solids loading rate. As a result, operators gain more control over sludge blankets, especially during storms, and tank capacity can be freed up for nutrient removal.

### IMPROVED SETTLING

The new process went online in February 2011, about the same time the plant staff made other modifications that included converting the extended aeration process to a Modified Ludzack-Ettinger (MLE) process. The operations staff worked closely with HTA and Evoqua to install and start up the BioMag System. Since it was a relatively new process, each group learned from the experience. Different parameters need to be monitored with a ballasted aeration basin and clarifier, especially the amount of magnetite in the system and the magnetite recovery rates.

With the process online, settling issues disappeared. The plant's seven-foot-deep clarifiers had been challenged in wet-weather conditions, but with ballasted solids, the plant can now handle a peak hourly flow five times the design flow while maintaining a steady sludge blanket.

The MLE and BioMag improvements also enabled the plant to nitrify. Before the BioMag, the plant could not fully nitrify because of

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inadequate solids retention time (SRT). Now, the plant easily achieves the SRT needed for complete nitrification with a high mixed liquor solids concentration because the clarifiers perform reliably and can handle the higher solids loading. The plant now achieves complete nitrification year-round.

### RECOVERING BALLAST

The treatment plant recovers about 95 percent of the magnetite for reuse. The rest ends up in the biosolids, increasing the iron content slightly. Solids wasted from the treatment process are dewatered on a screw press, combined with septage and landfilled.

The plant effluent meets BOD and TSS limits of 30 mg/L for release to the Merrimack River. While the state has not yet set new mass loading requirements, the plant's next permit most likely will require reductions in effluent concentrations as capacity increases.

That, plus anticipated requirements on ammonia, phosphorus and copper, will make the BioMag System and its ability to stabilize the process and improve effluent quality even more critical to plant performance. In sum, the plant staff and management can sleep better at night.

### ABOUT THE AUTHORS

*Dana Clement (dana.clement@gmail.com) is superintendent of the Allenstown (N.H.) Wastewater Treatment Plant, and Robert Backman (robert.backman@siemens.com) is senior technical manager with Evoqua Water Technologies. tpo*

### Share Your Idea

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

Send your ideas to [editor@tpomag.com](mailto:editor@tpomag.com) or call 715/277-4094.

# Pumps

By Craig Mandli

## Archimedes/Screw Pumps

### LOW-HEAD SCREW PUMP

Screw pumps from Lakeside Equipment Corporation offer built-in variable capacity that automatically adjusts the pumping rate and power consumption to match incoming flow while operating at a constant speed. They lift large volumes efficiently at low head at any treatment stage. Patterned after the Archimedean screw, the pump's assembly consists of a simple screw, upper bearing, lower bearing and drive arrangement. The pumps offer low operating costs, low maintenance, nonclogging operation and minimal head. No variable-speed electrical controls are required. **630/837-5640; www.lakeside-equipment.com.**



Screw pumps from Lakeside Equipment Corporation

### TUBE-MOUNTED SCREW PUMP



Tube-mounted screw pump from Schreiber

The Tube-mounted screw pump from Schreiber incorporates the Archimedean screw pump concept in a self-contained unit for ease of installation and construction. It transports liquid inside a stationary tube, simplifying design and eliminating grouting. The units are factory assembled. Pumps can be set at a fixed angle, or the lower end can be supported by a hoist to vary the pump angle and for maintenance access. The pump

provides variable capacity at constant speed. It uses a single-row spherical roller and self-aligning combination radial/thrust lower support bearing. A flanged bearing provides radial support at the upper shaft. **205/655-7466; www.schreiberwater.com.**

## Centrifugal Pumps

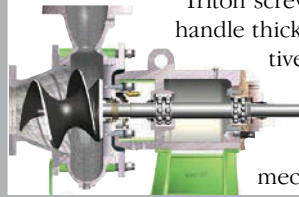
### HEAVY-DUTY END SUCTION CENTRIFUGAL PUMP

E, F and G Series heavy-duty end suction centrifugal pumps from Griswold Pump Company come in capacities to 3,000 gpm and heads to 310 feet. A broad range of sizes and configurations are available. They offer a choice of a close-coupled NEMA electric motor or frame mounting with couplings to electric motors, engines, steam turbines or belt-driven motors. Three hundred sixty-degree mounting capability extends installation options. Close-coupled configurations can be mounted vertically when space is at a premium. The back pullout design permits removal of the entire pump assembly for maintenance without disturbing piping connections. **909/512-1262; www.griswoldpump.com.**



E, F and G Series centrifugal pumps from Griswold Pump Company

### SCREW CENTRIFUGAL PUMP



Triton screw centrifugal pumps from Vaughan Company

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

### INLINE CENTRIFUGAL PUMP

The Stratos GIGA high-efficiency, single-stage inline centrifugal pump from WILO USA has an inline circulator that allows it to fit in tight spaces. Units offer heads to 167 inches and flows to 275 gpm and integrated electronic power adjustment. **866/945-6872; www.wilo-usa.com.**



Stratos GIGA centrifugal pump from WILO USA

## Chemical Feed Pumps

### SOLENOID ACTUATED DIAPHRAGM PUMP



MAGDOS diaphragm pump from Lutz-JESCO America

The MAGDOS LP solenoid actuated diaphragm pump from Lutz-JESCO America has a wide capacity range for accurate dosing. It offers capacities from 0.13 to 3.96 gallons per hour and pressure ratings to 232 psig. It uses batch dosing with interval and timer functions, an easy-logic menu with graphical display and eco-settings to optimize energy and chemical usage. Its dosing rate can be adjusted by changing the stroke frequency manually or by using a 0/4-20 mA signal. **800/554-2762; www.jescoamerica.com.**

### GENERAL UTILITY PUMP

General utility pumps from Moyno suit water sampling and chemical applications. Design simplicity reduces maintenance and downtime. Accurate, repeatable, nonpulsating, low-shear flow handles multiple applications. The compact units (flows to 50 gpm and pressures to 600 psi) are offered in motorized and nonmotorized models. Packing or mechanical seals are available. **877/486-6966; www.moyno.com.**



General utility pumps from Moyno

### LEAK-FREE DOSING PUMP

Hydraulic diaphragm pumps from SPX Flow Technology are designed for chemical dosing to enable safe handling and optimum usage of chemicals. The diaphragm separates pumped liquids from the atmosphere and drive mechanism. Few wear parts in contact with pumped fluids mean low maintenance. Diaphragms and wet-end pump parts are available in a range of materials. Suited for applications such as pH control and corrosion prevention, they use a cam and spring mechanism to drive the diaphragm. An adjustable crankshaft drives a plunger in hydraulic oil to move the diaphragm. **800/252-5200; www.spx.com.**



Hydraulic diaphragm pumps from SPX Flow Technology

## Chopper/Shredder/Grinder Pumps

### SHREDDER PUMP

Shredder pumps from BJM Pumps break solids into pieces so that they pass through easily without clogging. The Fang cutting impeller with hard-sharpened tungsten carbide shreds against a high-chrome suction wear plate. The 304SS motor housing provides high corrosion and abrasion resistance. **877/256-7867; www.bjmpumps.com.**



Shredder pumps from BJM Pumps

### GRINDER PUMP STATION

The E/One Extreme grinder pump station from Environment One Corporation offers 185 feet total dynamic head capability, corrosion protection and expanded communications. It needs no preventive maintenance and is available in prepackaged wet well/drywell systems. The grinder pump station collects wastewater, grinds up solids and moves the effluent through 1 1/4- to 4-inch pipe to treatment. **518/579-3068; www.eone.com.**



E/One Extreme grinder pump station from Environment One Corporation

### PRESSURIZED GRINDING SYSTEM

The InviziQ pressure sewer system uses grinding and pumping to move sewage efficiently to treatment facilities regardless of the terrain, slope, environmental sensitivity or topography. It offers a dry well design and clean access to the system motor and other working parts. Network monitoring and control is built in. **513/226-6961; www.inviziq.com.**



Pressure sewer system from InviziQ

### MANHOLE GRINDER PUMP PACKAGE

The Muffin Monster Manhole from JWC Environmental keeps rags and debris from clogging sewer lines and pump stations. The ready-to-install package includes a pre-built manhole, Muffin Monster grinder, guide rails, access ladder, inlet and outlet pipeline connections, and a manhole or hatch-type access lid. **800/331-2277; www.jwce.com.**



Muffin Monster Manhole from JWC Environmental

## Dewatering/Bypass Pumps

### MULTISTAGE PUMP

The e-HM stainless steel series horizontal multistage pump from Goulds Water Technology – a Xylem Brand, offers a broad hydraulic range, and a variety of configuration options. Efficient performance reduces carbon dioxide emissions and costs. Constructed of AISI 316 stainless steel, it is available in six models and a one-piece or sleeve design. Pressure-boosting capability and a space-saving footprint make it suitable in many configurations. The pump has a 127 gpm flow capacity. A balanced impeller reduces axial thrust by 40 percent, and a 20 percent thicker stainless steel pump body enhances durability. **866/325-4210; www.goulds.com.**



e-HM multistage pump from Goulds Water Technology – a Xylem Brand

### DOUBLE DISC PUMP

The Double Disc pump from Penn Valley Pump Co. handles solids including biosolids dewatering feed, thickened biosolids, digested biosolids, primary biosolids, scum, septage and lime slurry. The simple, durable design provides an extremely low wear rate, minimizing maintenance. The pump runs dry without damage, and has a hinged housing that allows complete servicing without disturbing the piping. **215/343-8750; www.pennvalleypump.com.**



Double Disc pump from Penn Valley Pump Co.

## Effluent Pumps

### WASTEWATER PUMPING SYSTEM

The Exporior wastewater pumping system from Flygt – a Xylem Brand, offers energy savings in a package that is easy to install and easy to operate. Adaptive N-technology allows the impeller to move axially upward when necessary to permit bulky or tough debris to pass through, reducing stress on the shaft, seals and bearings. It is available with efficient motors optimized for wastewater pumping. SmartRun intelligent controls enable programming to optimize energy use. **704/409-9700; www.flygtus.com.**



Exporior wastewater pumping system from Flygt – a Xylem Brand

### PORTABLE NON-CLOG PUMP

The Dri-Prime NC150 pump from Godwin, a Xylem brand deliver non-clog performance, high efficiency and energy. The compact pump has flow capabilities to 1,767 gpm and discharge heads up to 195 feet. It includes Flygt N-technology with a self-cleaning impeller. The automatic self-priming system primes and re-primers from dry without operator assistance or foot valve control. It has a dry-running high-pressure oil bath mechanical seal with abrasion-resistant silicon carbide faces. It can be customized with a diesel engine or electric motor on a highway trailer or skid-mount, or in a quiet enclosure. **800/247-8674; www.godwinpumps.com.**



Dri-Prime NC150 pump from Godwin, a Xylem brand

## Metering Pumps

### DIAPHRAGM METERING PUMP

The ProSeries Chem-Pro diaphragm metering pump from Blue-White Industries has a large pump enclosure and control pad, a protective snap-on control pad cover and a single-layer injection-molded diaphragm. Remote start/stop is standard; a 4-20 mA output is available. The unit has upgradeable firmware, a large single-piece junction box and terminal block connectors inside the junction box that include additional ports for external wiring. PROFIBUS, PROFINET and Ethernet are available. **714/893-8529; www.blue-white.com.**



ProSeries Chem-Pro pump from Blue-White Industries

(continued)

### METHANOL METERING PUMP

The Model QDX hazardous-duty metering pump from Fluid Metering meters methanol for wastewater treatment processes. It combines CeramPump valveless piston pumping technology with a QDX hazardous-duty drive. The CeramPump has only one moving part in contact with the process fluid — a rotating and reciprocating ceramic piston. The piston simultaneously rotates during pumping and is synchronized to alternately open and close the inlet and outlet ports, effectively functioning as a valve. **800/223-3388; www.fmipump.com.**



Model QDX hazardous-duty metering pump from Fluid Metering

### CHEMICAL METERING PUMP

The Qdos 30 chemical metering pump from Watson-Marlow Pumps Group delivers 5,000 to 1 flow from 0.002 to 8.0 gallons per hour at 100 psi, while integrating through IP66 manual, analog and PROFIBUS control options. The unit is fully sealed. Control features include fluid level monitoring, fluid recovery, line priming and intuitive flow calibration. The pump head can be configured on the left or right for installation in restricted environments or on skids. The sealed design and fluid recovery eliminate waste and ensure operator safety. Operation is intuitive via a menu-driven interface with 3.5-inch TFT color display. **800/282-8823; www.wmpg.com.**



Qdos 30 chemical metering pump from Watson-Marlow Pumps Group

## Peristaltic Pumps

### USER-SET OR REMOTE-CONTROLLED DISPENSING PUMP

The TPV DP adjustable rpm dispensing peristaltic pump from AALBORG Instruments has a timing device that permits dispensing via the user's settings or by optional remote input. Seven time periods ranging from 0.1 to 1 second to 10 to 100 hours are possible. It pumps low- to high-viscosity liquids, including fuel with the appropriate tubing. Fluids never touch the pump head. Models accommodate user-selected speeds from 0 to 300 rpm. Flow rates range up to 5,000 mL per minute in 1/2-inch tubing. **845/770-3000; www.aalborg.com.**



TPV DP pump from AALBORG Instruments

### HIGH FLOW-RATE PERISTALTIC PUMP

The LPP-T 4-inch peristaltic pump from Flowrox delivers up to 440 gpm. It compresses the hose only once per 360-degree revolution, extending hose life significantly. It can run dry without damage, does not require a flooded suction and works well in lift applications. It uses a precise hose compression system and secure hose end connections that incorporate a steel ring vulcanized into the end of the rubber hose. Hose and tube materials are available for multiple applications. **410/636-2250; www.flowrox.us.**



LPP-T peristaltic pump from Flowrox

### SEAL-FREE PERISTALTIC PUMP

Abaque peristaltic (hose) pumps from Neptune Chemical Pump Company handle solid particles to 0.7 inches and soft particles to 1.2 inches.

They use a seal-free design that eliminates leaks and enables pumping of fluids from abrasive and aggressive to shear-sensitive and viscous. The pumps can run in forward or reverse, are self-priming and dry-running and offer suction-lift capabilities to 25.5 feet. Ductile-iron and steel construction enables discharge pressures to 232 psi. **215/699-8700; www.neptune1.com.**



Abaque peristaltic (hose) pumps from Neptune Chemical Pump Company

## Rotary Lobe Pumps

### MOBILE ROTARY LOBE PUMP

Mobile rotary lobe pumps from Boerger are self-priming, valveless, positive-displacement units for rapid deployment of floodwater, stormwater, domestic wastewater, industrial effluents and biosolids, spills, and digester and lagoon clean up. Twenty pump models in six series are offered with pulsation-free operation, fully reversible rotation, dry-run capabilities and flow rates to 5,000 gpm. All wear parts can be replaced through the front cover without removal of piping or drive systems. **612/435-7300; www.boerger.com.**



Mobile rotary lobe pumps from Boerger

### GEARBOX-FREE ROTARY LOBE PUMP

The TORNADO T2 rotary lobe pump from NETZSCH Pumps North America has lobes running inside a metal housing with a replaceable elastomer liner. It needs no O-rings or gaskets, and a single synchronous-toothed timing belt eliminates the gearbox. A pulsation reduction system of channels molded into the rubber walls of the pumping element releases lobe energy and dampens pulsation. Full service-in-place engineering provides easy access to mechanical seals, rotors, liners, and for timing the lobes without disassembling pipes. The single timing belt drive eliminates a second reduction component. No oil is needed and there are no timing gears. **610/363-8010; www.netzschusa.com.**



TORNADO T2 rotary lobe pump from NETZSCH Pumps North America

## Solids/Sludge Pumps

### STAINLESS STEEL SKIMMER

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



Alpha stainless steel skimmer from Megator

enables it to operate in as little as 12 inches of water. The skimmer can be arranged for gravity flow in new construction. **800/245-6211; www.megator.com.**

### BIOSOLIDS PUMPING SYSTEM

V-RAM pumping systems from Olson Mfg. Co. move 12- to 30-percent solids biosolids with up to 700 psi operating pressure and pumping

(continued)

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V-RAM pumping systems from Olson Mfg. Co.

volumes up to 5,600 gallons per hour. They are designed for continuous high-pressure pumping. They use ball check valves proven over 50 years in liquid/slurry applications. With a life expectancy of more than 30,000 hours, the ball check valves are readily accessible and have a self-cleaning action. The hydraulic unit uses open-looped horsepower-limited hydraulics that develop only the pressure needed to push the material, saving energy. **888/373-3996; www.vram.com.**

### VERSATILE BIOSOLIDS PUMP



Biosolids pumps from Schwing Bioset

Biosolids pumps from Schwing Bioset can dewater biosolids from belt presses, centrifuges, plate-and-frame presses and screw presses. They withstand tough environments with a volumetric capacity exceeding 300 gpm and operating pressures up to 1,885 psi. Along with pumping non-flowable materials, they pump scum and grease.

**715/247-3433; www.schwingbioset.com.**

### CAKE PUMP SYSTEM

The piping-contained cake transfer solution from seepex replaces the open-air cake transfer method using conveyors. The pitch, diameter and speed of the auger that pushes the cake into the pumping element can be adjusted to match the application, while load cells automate the process. The hopper is fitted with sensors that detect the increase in weight and adjust the speed of the pump accordingly, saving energy. The system uses a pressure sensor, a dry-running protection sensor, and a boundary layer injection system. **877/806-4152; www.seepex.com.**



Cake transfer solution from seepex

## Submersible Pumps



Air diaphragm pump from All-Flo Pump Company

### AIR DIAPHRAGM PUMP

The lubrication-free 1-inch air diaphragm pump from All-Flo Pump Company has a non-stall/freeze air system. Engineered for fluid and chemical compatibility, the bolted design offers ease of maintenance and leak-free operation. It is available in a variety of materials and options. A Max-Pass valve system allows operation under conditions from clean fluids, to slurries, to solids up to 3/4 inch. Pump sizes range from 1/4 to 3 inches. **440/354-1700; www.all-flo.com.**

### SUBMERSIBLE CISTERN PUMP

C1 Series stainless steel submersible cistern pumps from Franklin Electric are designed for use in graywater/filtered effluent service applications, and include the ability to pass solids up to 1/8 inch in diameter without impacting pump life. They are constructed of a 304 stainless steel motor and outer shell with engineered polymer hydraulics providing corrosion resistance and abrasive handling. Features include a thermo-plastic discharge head to avoid breakage during installation and operation, removable



C1 Series pumps from Franklin Electric

5-inch-wide base for secure and reliable mounting, a motor lead connection protected with a rubber boot and secured with a stainless steel strain relief, and a bottom suction design allowing maximum fluid drawdown without compromising durability or pump life. It is available in flow ratings of 10, 20 and 30 gpm, with a maximum shut-off pressure of over 100 psi, and is available with a 115- or 230-volt 1/2 hp single-phase motor. **800/269-0063; www.franklin-electric.com.**



S3T submersible trash pump from Hydra-Tech Pumps

### SUBMERSIBLE TRASH PUMP

The S3T 3-inch hydraulic-drive submersible trash pump from Hydra-Tech Pumps fits into 12-inch openings and is used where lightweight, high-volume pumps are needed. For jobs with limited solids, a small-hole water strainer is available. Combined with the company's HT11 to HT15 power units, it handles flows up to 380 gpm. The variable-speed hydraulic drive can be used where electric power is hazardous or impractical. **570/645-3779; www.hydratech.com.**

### AXIAL PUMP

Axial-flow pumps (also known as recirculation pumps or propeller pumps) from Landia are installed between adjacent tanks or in a channel, where they are used to create flow. Suited to numerous applications including wastewater treatment, stormwater control and slurry pumping, they recirculate or transfer large volumes at low head. A sturdy planetary gear system enables high energy efficiency. The pumps have

a triple shaft sealing system and are available in cast iron or stainless steel. **919/466-0603; www.landiainc.com.**



Axial-flow pumps from Landia



ABS submersible sewage pumps from Sulzer Pumps Solutions

### SUBMERSIBLE SEWAGE PUMP

ABS submersible sewage pumps from Sulzer Pumps Solutions Inc. use premium-efficiency IE3 motors for low operating cost, and reduced carbon footprint. Long-term reliability limits the risk of overflows. A Contrablock Plus impeller provides quality rag handling. **800/525-7790; www.sulzer.com.**

### AIR-DISTRIBUTION SYSTEM AODD PUMP

The Pro-Flo SHIFT air distribution system (ADS) AODD pump from Wilden Pump & Engineering saves operating costs while providing high product yield. The pump is submersible and offers plug-and-play operation. It is available in 1 1/2-, 2- and 3-inch sizes, discharge pressures to 125 psig, flows to 243 gpm and suction lifts to 23.8 feet dry and 30.6 feet wet. The pump handles up to 1/2-inch solids. **909/422-1730; www.wildenpump.com.**



Pro-Flo SHIFT air distribution system (ADS) AODD pump from Wilden Pump & Engineering

## Vertical/Lift Station Pumps

### ABOVE-GROUND LIFT STATION

The ReliaSource 8- by 9-foot above-ground lift station from Gorman-Rupp offers the company's pumps, controls and enclosures. It comes

(continued)



fully assembled and tested to operating conditions. It accommodates Super T Series or Ultra V Series self-priming, heavy-duty solids-handling pumps from 2 to 60 hp and offers flows to 2,600 gpm and heads to 160 feet. It handles solids up to 3 inches. **419/755-1011; www.grpumps.com.**



**ReliaSource lift station from Gorman-Rupp**



**X-PELLER pumps from Smith & Loveless**

### VERTICAL NON-CLOG WASTEWATER PUMP

X-PELLER 4- to 8-inch pumps from Smith & Loveless suit vertical non-clog pumping of wastewater high volumes of trash, solids and flushables. It is balanced through the full trim with less than 3 mil vibration. Its single-valve design expels high volumes of stringy materials, rags and other problem flushables. It also suits extremely low-flow applications (0 to 500 gpm). It comes in 900, 1,200 and 1,800 rpm models and is fully trimmable at the factory or in the field to specific pumping conditions. **800/922-9048; www.smithandloveless.com.**

### EMERGENCY BACKUP LIFT STATION STANDBY SYSTEM

The Thompson Backup System from Thompson Pump & Manufacturing Co. is a permanently installed standby pump that continues pumping despite power loss or primary pump failures. The automatic self-priming pump set can meet system demands during wet weather, routine maintenance, new construction or emergency repair. It includes the Enviroprime System, which actively prevents sewage spills. It uses programmable electronic controls that use sensors to monitor levels in the wet well and initiate backup pumping as programmed. SCADA-capable controls send alarms to operators. Systems are available with the Silent Knight canopy to reduce noise for residential areas. **800/767-7310; www.thompsonpump.com.**



**Thompson Backup System from Thompson Pump & Manufacturing Co.**

## Pump Controls

### PROCESS METER PUMP CONTROL



**ProVu PD6000 process meter from Precision Digital Corporation**

The ProVu PD6000 process meter from Precision Digital Corporation has a programmable, dual-line, 6-digit display readable in sunlight; advanced signal input conditioning for flow and round horizontal tanks; and Modbus RTU serial communications. The large upper display can be programmed for PV, max, min, alternating max/min, alarm set points or Modbus input. The lower display can display engineering units, setpoints or user-defined legends, or be turned off. It can also be scaled for different units. It supports up to eight pumps. **800/343-1001; www.predig.com.**

### DUPLEX LIFT STATION CONTROLLER

The Station View duplex lift station controller from PRIMEX Controls

offers level monitoring, flow monitoring, pump level in feet, bar graph, float status and pump gpm. It provides pump amp, pump flow, power loss and pump HOA selector switch monitoring. The graphic backlit display offers easy navigation, intuitive setup and a real-time clock. It is equipped with an SD card slot for data logging, and can provide 24-hour data logging with seven days of historical data. **888/342-5753; www.primexcontrols.com.**



**Station View duplex lift station controller from PRIMEX Controls**

## Pump Parts/Supplies/Service

### MORTAR APPLICATION PUMP



**M680 Mortar Pump from Graco**

The M680 Mortar Pump from Graco reduces labor for projects such as resurfacing cement so that protective coatings or linings can be applied. It speeds surface preparation by allowing contractors to spray heavy materials onto the surface, rather than trowel them on by hand. It works with abrasive materials such as cementitious coatings, epoxy-based mortars, nonskid coatings, and polymers with fillers such as glass flake, silica or sand. Designed with a high-velocity circulating flush, it is easy to clean. **612/623-6000; www.graco.com.**

### PUMP LIFE CYCLE COST CALCULATOR

The Met-Pro Global Pump Solutions online calculator lets operators quickly estimate total life cycle cost for one or more pumps. Users input data including initial pump costs, installation costs and annual recurring costs. The calculator accounts for energy costs and generates an analysis. **215/723-8155; www.mp-gps.com.**



**Online calculator from Met-Pro Global Pump Solutions**



**Phase converters from Ronk Electrical Industries**

### PHASE CONVERTER

Phase converters from Ronk Electrical Industries can be used in water and wastewater systems whenever three-phase power is needed and only single phase is available from the utility, or to run three-phase for a specific installation in a remote location. Lift stations, submersible pumps and aeration systems can be run from phase converters if properly sized and engineered. Systems can alternate up to seven pumps of various horsepower. Converters are suited to remote locations when a reliable, easy-to-maintain solution is needed. **800/221-7665; www.ronkelectrical.com.**

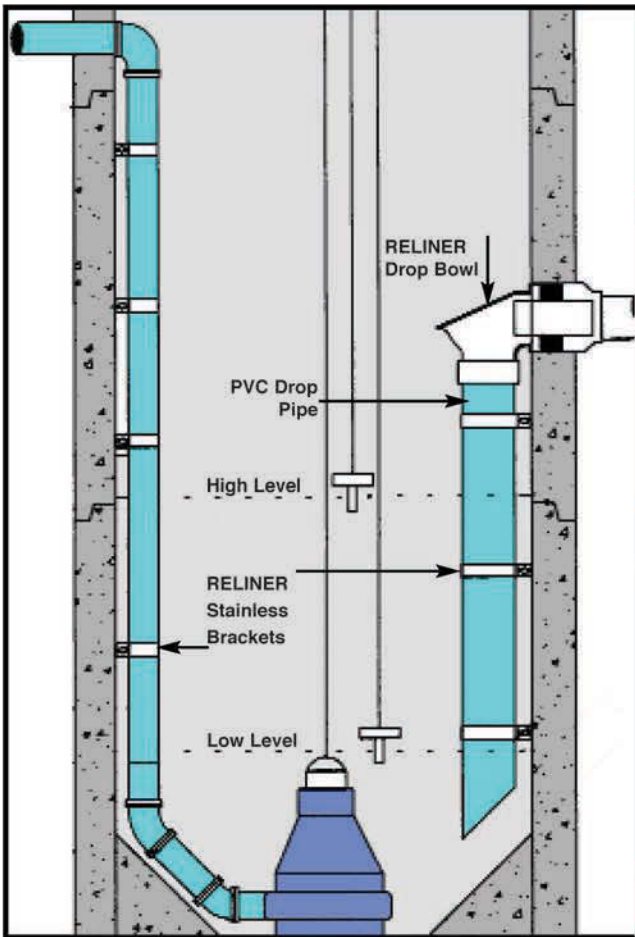
### SCREW PUMP RESTORATION

Evoqua Water Technologies (formerly Siemens Water Technologies) supplies original-equipment Internalift screw pump component replacements and repairs for lifting of liquids in municipal or industrial applications. Company experts pro-



**Screw pump restoration from Evoqua Water Technologies**





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vide equipment evaluations and recommend best options to restore original pumping efficiency, extend useful life, avoid downtime, and meet plant operating budgets. Turnkey services include removal or rehabilitation of existing equipment and installation of new equipment or components. [www.evoqua.com](http://www.evoqua.com).

### SUBMERSIBLE PUMP DISCONNECT RAIL SYSTEM

The Z-Rail disconnect system from Zoeller Company is designed for threaded discharge pumps. The ductile iron design can support pumps up to 300 pounds. Its grooved machined seating surfaces seal up to 250 feet of head. The compact design fits most basins, allowing easy installation or removal of the pump from outside the basin. A properly sized rail system allows the pump to slide down into the basin through the cover and automatically engages the discharge piping.

800/928-7867; [www.zoeller.com](http://www.zoeller.com). tpo



Z-Rail disconnect system from Zoeller Company

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By Craig Mandli

## Electromechanical diaphragm pumps deliver consistent flow

### Problem

The City of Nampa (population 80,000) is the largest and fastest growing city in Canyon County, Idaho. The wastewater treatment plant, which also serves neighboring Caldwell, had been using lobe-style positive-displacement pumps to transfer thickened sludge from the primary clarifier underflow to further processing. With lobes rotating in close tolerance, these pumps experience wear and needed monthly maintenance.

### Solution

MWH, a consulting company in Boise, worked with the city to select three **ABEL EM 100 electromechanical diaphragm pumps**, based on success at the Weber Wastewater Treatment Plant in Ogden, Utah and the Colorado Springs (Colo.) Wastewater Treatment Plant. Each pump has 250 gpm capacity and delivers consistent flow regardless of backpressure fluctuation. A grinder pump precedes each electric diaphragm pump.



#### RESULT

Maintenance downtime decreased, and reliability increased, yielding significant monthly savings. **412/741-3222; www.abelpumps.com.**

## Plant chooses upgraded plunger pump to replace 50-year-old model

### Problem

In 1963, the Greater Chillicothe (Ill.) Sewer District purchased two Komline-Sanderson Model KSS-9-1 simplex 9-inch plunger pumps to transfer primary sludge to the anaerobic digester. Fifty years later, the district needed to replace one pump in a project to replace a digester cover.

### Solution

Based on experience with the two pumps and two Model KS-11-1 plunger pumps purchased in 1993, the district, through Baxter & Woodman, specified the same **Komline-Sanderson pump** for an expected service life lasting decades. The pumps move 90 gpm of primary sludge at 3 to 5 percent solids to an anaerobic digester at discharge pressures of 30 feet total dynamic head for about 30 minutes a day. Since 1994, the district has purchased only \$3,300 of routine spare parts for the pumps, amounting to a cost of 16 cents per day.



#### RESULT

The district is pleased with the parts and service department. David Day, plant superintendent, referred to the pumps as "indestructible." **800/225-5457; www.komline.com.**

## Screw pumps solve high-lift pumping problem

### Problem

The wastewater treatment plant in Willmar, Minn., needed a single-stage screw pump solution for 43.2 feet of lift. The plant team hoped to avoid using submersibles or two-stage screw pumps.

### Solution

The plant installed three **Landustrie open screw pumps from EPIC International** in 2010. They pump 8,333 gpm. The pumps, 84 inches in diameter and 74 feet 6 inches long, have solid one-piece ductile cast-iron (not welded) upper and lower shafts and flanges and reinforced flight starts. They use fully self-aligning bearings and factory shot blasting and painting.



#### RESULT

The screw pumps solved the lift problem, and have run without incident since they were installed. **804/798-3939; www.epicintl.com.**

## High-capacity screw pumps used to convey mixed liquor to aeration tanks

### Problem

CH2M HILL/Ambiotec Civil Engineering Group (a joint venture) won a contract to design and construct a major expansion for the Robindale Wastewater Treatment Plant in Brownsville, Texas. The facility needed to integrate the existing plant with the additions. New final clarifiers had to be installed at grade to reduce cost and address groundwater issues. This meant mixed liquor had to be pumped from the new aeration tanks to the clarifiers. Typical centrifugal pumps were not suitable because they would cause breakup of mixed liquor biological floc from the aeration tanks, hindering settling in the clarifiers.

### Solution

**Pro-Equipment Inc. supplied open screw pumps** to handle mixed liquor transport to the clarifiers. Screw pumps were selected for their gentle hydraulics, limiting floc degradation. Four high-capacity pumps provide a lift of 18 feet at a maximum flow of 15,000 gpm per pump. Each pump is driven by a 100 hp motor through a high-reduction gear reducer to rotate at 40 rpm.



#### RESULT

The first two screw pumps were installed and successfully tested to verify capacity and one pump was placed in service. Installation of the two remaining pumps was pending. **262/513-8801; www.proequipment.com.**

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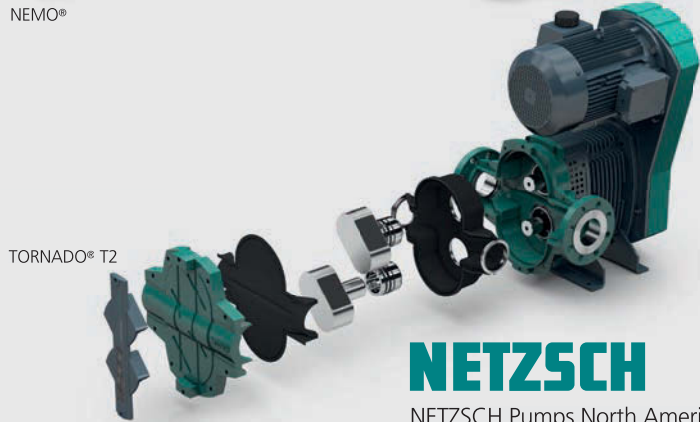
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 See top performer article in this issue!

## Automated bypass system increases efficiency and safety

### Problem

A New York wastewater treatment plant needed yearlong treated water during construction. Factors including physical parameters, a small effluent pit, labor cost concerns and variable flow during stormwater surges dictated an automated system, responsive enough to manage the variable flow to scale pumping rates up and down on the fly as effluent and storm surges varied.

### Solution

**Rain for Rent developed a four-stage automated pumping system** triggered by submersible transducers that measure the water level.

As water levels in the pit changed, the electric DV400c 16-inch pumps were throttled up or down by variable-frequency drives (VFD) controlled by preprogrammed analog data reporting units (AnDRU Boxes). Treated water was bypassed from the pit and discharged.



### RESULT

The automated system allowed construction on plant upgrades to proceed without interruption from increased effluent and stormwater during a 100-year storm event. **800/742-7246; www.rainforrent.com. tpo**

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**1. REDLINE HIGH-SPEED WIRELESS SYSTEM**

The Redline Transport Gateway (RTG) Connect high-speed wireless system from Redline Communications is designed to securely connect industrial SCADA systems, providing real-time data collection from and control of devices such as programmable logic controllers, remote terminal units, natural gas meters and pump controllers. **866/633-6669; www.rdlcom.com.**

**2. EVOQUA WATER TECHNOLOGIES BIOMAG SYSTEM**

The BioMag magnetite ballasted system from Evoqua Water Technologies (formerly Siemens Water Technologies) infuses magnetite into conventional biological floc to make it heavier, dramatically improving settling rates, capacity and secondary biological performance without the addition of capital-intensive new tankage. **www.evoqua.com.**

**3. FCI AIR/GAS BIOGAS DIGESTER FLOWMETER**

The ST51 mass flowmeter from Fluid Components International provides precise air/gas flow measurement in demanding environments, including biogas digester systems. The explosion-proof instrument requires little maintenance and no moving parts. Its nonlogging design operates over a wide flow range from 0.3 to 400 SFPS (0.08 to 122 MPS) with low-flow sensitivity. Available for use in line sizes from 2 to 24 inches in diameter, the meter operates in temperatures from 0 to 250 degrees F (-18 to 121 degrees C) and withstands pressure up to 500 psig. **800/854-1993; www.fluidcomponents.com.**

**4. ENDRESS+HAUSER MULTIPARAMETER TRANSMITTER**

The Liquiline CM44x multichannel transmitter from Endress+Hauser features EtherNet/IP connectivity for seamless integration with the Rock-

well Automation PlantPax process automation system. The integrated Web server enables the operator to remotely view diagnostic data, perform configuration or access device parameters. The modular four-wire transmitter is available in one- to eight-channel expandable versions. **888/363-7377; www.us.endress.com.**

**5. NEPTUNE CLEAR BROMINE FEEDERS**

Model CLR-25 and CLR-50 clear bromine feeders from Neptune Chemical Pump Co. are designed to feed solid biocide or other corrosive water treatment chemicals into a closed-loop system in cooling towers. The CLR-25 has a total capacity of 11.3 kg (25 pounds) with an outlet feed rate of 2.5 to 4.8 kg (5.5 to 10.6 pounds) and flow range of 3.8 to 37.8 lpm (1 to 10 gpm). The CLR-50 has a total capacity of 22.7 kg (50 pounds) with an outlet feed rate of 3.6 to 7.3 kg (8 to 16 pounds) and flow range of 3.8 to 37.8 lpm (1 to 10 gpm). **215/699-8700; www.neptune1.com.**

**6. THOMAS & BETTS INTERCONNECTION SYSTEMS**

Russellstoll interconnection systems by Thomas & Betts Corp., a member of the ABB Group, range from 20 to 600 amps. Maintenance free, they are fully polarized for exact voltage, frequency and phases. Solderless, pressure screw terminals and rear access, combined with take-apart housings, provide quick wiring access. **901/252-5000; www.tnb.com.**

**7. LWT AMPHIBIOUS DREDGE**

The Mud Cat Traxx amphibious dredge from Liquid Waste Technology has a 115 hp John Deere engine and dual-track drive, enabling it to maneuver over ground and into lagoons, lakes, rivers or canals. Options include tools for mechanical excavating and hydraulic dredging down to 10 feet, as well as weed cutting, raking and collection. **800/243-1406; www.lwtpithog.com.**



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## 8. SCHNEIDER ELECTRIC MOBILE PROGRAMMING APP

The Altivar 212 mobile programming app and drive to iPad converter cable from Schneider Electric enables users to perform Altivar 212 and S-Flex drives programming through Apple iPads. The free app, which can be downloaded from Apple iTunes, contains menu-driven parameter sets that walk users through the drive configuration process. **888/778-2733; [www.schneider-electric.us](http://www.schneider-electric.us)**.

## 9. STANLEY VIDMAR 5S CABINETS

5S cabinets from Stanley Vidmar are designed to fulfill lean and Kaizen storage requirements. Features include Plexiglas or solid hinged doors with metal pegboard inserts, heavy-duty lock and difficult to duplicate key system to safely secure valuable items. **800/523-9462; [www.stanleyvidmar.com](http://www.stanleyvidmar.com)**.

## 10. ROTORK EXPLOSION-PROOF ACTUATORS

ExMax quarter-turn, explosion-proof actuators from Rotork Schischek are designed for use in Ex areas for all gases, mists, vapors and dust. The 90-degree turn damper and valve electric actuators have a temperature range of -40 to 50 degrees C (-40 to 122 degrees F) and watertight IP66 ratings. Options include spring-return configuration, stainless steel housing, two external auxiliary switches, terminal box, safety temperature trigger and manual override. **336/659-3493; [www.rotork.com](http://www.rotork.com)**.

## 11. PULSAFEEDER POLYMER MAKEDOWN SYSTEMS

Polymer makedown systems from Pulsafeeder are available in automatic and manual versions. The systems feature a three-step, static blending system that provides dilution without harming polymer chains. Systems are available in 0-5 gpm, 5-10 gpm and 10-plus gpm water flow rates. The system is custom-sized to activate all type of polymers with five neat polymer pump flows available. Systems include an auto-fill calibration column, adjustable flowmeter and neat polymer back pressure regulator. **585/292-8000; [www.pulsafeeder.com](http://www.pulsafeeder.com)**.

(continued)

## product spotlight

### High-capacity UV system matches lamp output to disinfection needs

By Ed Wodalski

The **Aquaray HiCAP** ultraviolet disinfection system from **Ozonia North America** is designed for high capacity wastewater treatment plants (10 mgd and larger) requiring a reduced footprint and advanced controls. The vertical lamp system (VLS) features 1,000 watt, amalgam UV lamps and three module sizes for increased flexibility.

"The HiCAP is unique because it provides engineers and designers several options," says Christopher Huynh, market manager for Ozonia. "Our modules have increments of 12, 24 and 36 lamps. This allows the system to be sized very accurately to the actual plant flow conditions, so you save on the footprint as well as the number of UV lamps.

"One thing our customers really like about the vertical lamp systems is they provide easy access to the lamps and ballast without having to remove the module," he says. "The components can all be easily removed without any special tools while the module is inside the channel."

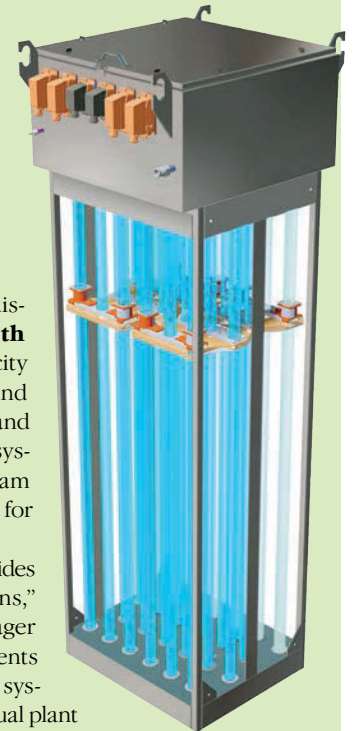
Staggered arrays eliminate short circuiting and low UV intensity zones. "The labyrinth of lamps ensures all parts of the flow and any particular microorganism always comes into contact with a lamp in a high UV intensity area," Huynh says. "If an organism were to go through a low intensity zone around a lamp, in the gap between the lamps there's always another lamp to pick up the slack. Additionally, baffles direct water from the outer edges of the lamp array toward the center where there's the least probability of having low UV intensity."

The optional automatic bank lifting system (ABLS) enables operators to remove UV banks from the channel with the press of a button, eliminating the need for an overhead crane when performing maintenance or winter storage.

Ozonia's Opti-Dim, row-by-row, flow-pacing and lamp dimming technology saves energy by reducing the total number of lamps in operation. System efficiency is further optimized by dimming lamps. An intuitive touch-screen human machine interface (HMI) provides lamp and power tracking while Ethernet connections enable remote monitoring and troubleshooting.

"Opti-Dim technology controls the number of lamps used and their output, depending on operating conditions," Huynh says. "So when the PLC sees any change in UV transmittance, the flow rate, UV intensity — or any other parameter that's sent to the plant PLC — the system automatically turns on or off rows of lamps. Secondly, it will dim the lamps to ensure you're always meeting the exact UV dose. As a result, there's very little under-dosing or over-dosing; energy consumption is optimized based on real-time plant conditions."

The Aquaray HiCAP system can be used in new construction as well as retrofitted into existing chlorine contact basins. **201/676-2525; [www.ozonia.com](http://www.ozonia.com)**.



Aquaray HiCAP from Ozonia North America



**12. ERGODYNE HEAD PROTECTION**

The Skullerz head protection line as well as the Skullerz 8950 bump cap and 8960 bump cap with LED lighting from Ergodyne are designed for applications with overhead hazards but do not require a hard hat, protecting workers from bumps, bruises and cuts. The hats feature a flanged shell that expands or contracts to fit the worker's head for a secure fit. Thermo-formed foam and a ventilated shell provide optimized breathability. The shell also can be removed for cleaning. **800/225-8238; www.ergodyne.com.**

**13. ROCKWELL AUTOMATION ELECTRONIC OVERLOAD RELAY**

The Allen-Bradley E300 electronic overload relay from Rockwell Automation integrates communications, including EtherNet/IP, current measurement technology and I/O options in a modular design. The dual-port EtherNet/IP option enables overload relays to be daisy-chained and eliminates the need for an Ethernet switch. **414/382-2000; www.rockwellautomation.com/industries/water.**

**14. INDUSTRIAL TEST SYSTEMS HAND-HELD PHOTOMETER**

The eXact iDip hand-held photometer from Industrial Test Systems uses Bluetooth Smart wireless technology to connect with an iPhone, iPad or iPod Touch, enabling test data to be shared via email, while the built-in GPS provides easy retrieval of water locations. **800/861-9712; www.sensafe.com.**

**15. DEZURIK SEVERE SERVICE KNIFE GATE VALVE**

The KSV severe service knife gate valve from DeZURIK Water Controls features ANSI B16.34 Class 150 and 300 pressure ratings, bidirectional dead end shut-off capability, bidirectional drip tight seal, bonnetless

design for ANSI 300 service and hardened seat materials. **320/259-2000; www.dezurik.com.**

**16. MIOX ON-SITE CHEMICAL GENERATORS**

On-site chemical generators from Miox Corp. are designed for water and wastewater disinfection. Mixed oxidant solution (MOS) and hypochlorate generators are available in a variety of sizes. The vault uses salt and power to generate 15 to 100 gpd or pounds per day of chemical at the point of use. The generators feature air-cooled power supply, corrosion-resistant cabinet and touch-screen display. **800/646-9426; www.miox.com.**

**17. XYLEM PROCESS PERFORMANCE OPTIMIZER**

The OSCAR process performance optimizer from Sanitaire — a Xylem Brand, is designed to help reduce a facility's energy consumption by 65 percent. The system provides a detailed overview of plant operations and performance. Combining real-time analytics with smart process control programming, the system monitors influent, in-basin and effluent parameters. It also can fine-tune aeration control and use sludge inventory management systems (SIMS) software to maintain optimal solids retention time. With up to 20 sensors, the modular design can be adapted for future requirements. **414/365-2200; www.sanitaire.com.**

**18. PALMER WAHL CUSTOM DIAL FACES**

Custom dial faces from Palmer Wahl Instrumentation Group are available on bimetal and direct drive dial thermometers and pressure gauges with screw-on bezels. Custom options include dial scales with different units of measure, color scales, high visibility markings, color pie-wedge sectors, bands or lines. Warnings or quick reference instructions for operators or QR codes are available. **800/421-2853; www.palmerwahl.com.**



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## 19. GREYLINE MULTI-SENSOR AREA-VELOCITY FLOWMETER

The AVMC 5.1 multi-sensor area-velocity flowmeter from Greyline Instruments is designed for municipal stormwater, combined effluent, raw sewage and irrigation water. The flowmeter uses three submerged ultrasonic sensors to continuously measure velocity at different points in the channel and provide an average velocity reading for flow monitoring. One of the sensors also can monitor the water level or a separate, non-contacting ultrasonic level sensor can be used in the system. **888/473-9546; www.greyline.com.**

## 20. ANUA ZERO-ENERGY BIOFILTRATION SYSTEM

The Compact Monafil zero-energy biofiltration system from Anua uses granular, high-density peat media to remove odors, VOCs, sulfur and nitrogen-based compounds. The system also uses shell-based media to maintain a neutral pH within the prepackaged biofilter. **800/787-2356; www.anua-us.com.**

## 21. SENSOREX DIRECT FIT REPLACEMENT PROBES

S420 Series probes from Sensorex Corp. are designed as a direct replacement for Strantrol pH and ORP probes. Made of CPVC, the chemically resistant probes have a measurement range of 0-14 pH or -1,000 to 1,000 mV for ORP, temperature range of 0 to 50 degrees C (32 to 120 degrees F) and maximum pressure of 100 psig. The threaded 1/2-inch NPT connection enables inline installation. Both probes are available with 30-inch or 10-foot cable. **714/895-4344; www.sensorex.com.**

## 22. FREEWAVE WIRELESS I/O NETWORKING

The WaveLine 10i, Class I, Division I (C1D1) certified high-performance wireless I/O networking from FreeWave Technologies is designed for applications in hazardous environments in water and wastewater industries. The system monitors pressures, temperatures and liquid levels, while eliminating the need for conduit and installation outside of the C1D1 area. **800/548-5616; www.freewave.com. tpo**

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### ACTIVATED SLUDGE PROCESS CONTROL (ASPC)

October 28-30, 2014 (Las Vegas, NV)  
CONTACT HOURS: 24



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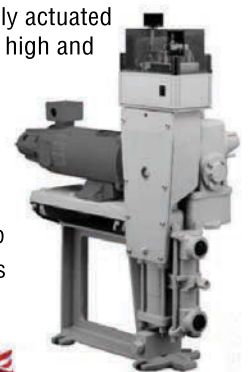


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### CXT wireless gas detectors receive CSA approval

CXT Series SmartWireless gas detectors from Detcon, an IST company, received CSA Class I, Division I approval. Available in two versions, the CXT-IR has an infrared sensor for monitoring combustible hydrocarbons, while the CXT-DM has an electrochemical sensor for monitoring toxic gases and oxygen.

### CH2M HILL's Huggins receives ACEC award

Norm Huggins, CH2M HILL senior vice president, received the Association of Consulting Engineering Companies – Canada (ACEC) Beaubien Award for lifetime contributions to advance the consulting engineering industry and profession, as well as service to the ACEC.

### SJE-Rhombus names sales representative

SJE-Rhombus named Fluid Solutions Sales Agency product representative in Atlantic Canada, including New Brunswick, Newfoundland, Labrador, Prince Edward Island and Nova Scotia. Shawn Davidson, founder and principal of Fluid Solutions, has nearly 30 years of experience in the water industry.



Shawn Davidson

### Engineering America spins off process equipment business

Engineering America, provider of liquid storage and process equipment, will spin off its water and wastewater process equipment business to focus on its storage tank business. The new independent company, Great Northern Environmental, will specialize in water and wastewater treatment equipment sales and serve as sales agent for Engineering America's various tank and aluminum dome products.



### FCI releases product and services catalog

Fluid Components International released its latest products and services catalog CD. The free catalog is available by visiting the company's website, [www.fluidcomponents.com/cd](http://www.fluidcomponents.com/cd).



### AEA Investors acquire Siemens Water Technologies

AEA Investors acquired the municipal, industrial and services water and wastewater treatment operations and assets of Siemens Water Technologies for 640 million Euros (approximately \$860 million U.S. Dollars). Dr. Lukas Loeffler, CEO, and his management team will remain.

### HDR's Cleary co-authors industrial wastewater book

HDR's Joe Cleary, senior vice president and section manager of engineering design services in the New Jersey office, co-authored *Activated Sludge Technologies for Treating Industrial Wastewaters – Design and Troubleshooting*. The book was written for students, plant operators and engineers seeking information and case studies on activated sludge biological treatment.

### Bilco's single-leaf smoke vents receive UL approval

The Bilco Co.'s Type SV single leaf, automatic smoke vents received UL approval per the UL 793 standard for automatically operated roof vents for smoke and heat.

### PRIMEX adds sales engineer

PRIMEX, formerly Control Works, hired Perry Baldwin as sales engineer. Based in Milford, Ohio, Baldwin has 30 years of engineering experience and 10 years experience in the wastewater control panel industry.



Perry Baldwin

### FMC Corp. launches website

FMC Corp. launched its environmental website, [www.environmental.fmc.com](http://www.environmental.fmc.com). The site includes soil and groundwater remediation and water treatment products, technologies and service model, as well as access to technical resources.

### Simtronics gas detectors HART compliant

GD10 infrared combustible and carbon dioxide gas detectors from Simtronics, an IST company, satisfied requirements for the HART Communication Foundation's quality assurance and device registration, Version 7.

### LUDECA launches Keep It Running microsite

LUDECA launched its Keep It Running microsite, [www.keepitrunning.com](http://www.keepitrunning.com). The site supports the company's new message of No Excuses for High Vibration, Misalignment and Unbalance and includes blogs, video tutorials, white papers and maintenance technologies.



### Yaskawa names distributor

The Drives & Motion Division of Yaskawa America named DRV of Pittsburgh, Pa., its medium voltage drive distributor in the United States.

### Krausz Industries opens Florida facility

Krausz Industries, manufacturer of the Hymax coupling, opened a facility in Ocala, Fla. The location will warehouse product for the water and wastewater industry and provide custom fabrication. **tpo**



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### Anaergia invests in large-scale biosolids facility

Anaergia made a strategic investment in a large-scale biosolids processing facility in Rialto, Calif. Having acquired the infrastructure and assets of the \$160 million facility previously owned by EnerTech Environmental, Anaergia plans to improve efficiency, upgrade technologies and create a state-of-the-art facility using proven, best-in-class technologies. The investments will allow Anaergia to expand processing capacity in the same footprint, helping cities meet biosolids challenges and divert material from landfills. Upgrades to be completed in 2015 center on construction of advanced anaerobic digesters that will generate renewable energy for facility operation, reduce biosolids volume and enable acceptance of additional organic material at the site.

The company also entered a 20-year partnership with the City of Bridgeport (Conn.) Water Pollution Control Authority that will enable the city to use renewable electricity generated from biosolids and food scraps using advanced anaerobic digestion technology. The digestion facility will generate more than 10 million kWh per year, enough to power more than 1,000 homes.

### Grundfos is part of project to extract phosphorus from wastewater

In cooperation with Danish water authority Aarhus Water and others, Grundfos is part of a project at Aby wastewater treatment plant in Aarhus, Denmark, that will test technologies to extract phosphorus from wastewater. The plant opened in November 2013. Grundfos is supplying specialized components for phosphorus extraction including dosing pumps, booster systems and control systems for the treatment plant.

### I. Kruger to upgrade Georgia treatment plant

I. Kruger, a Veolia Water Solutions & Technologies company, won a contract to upgrade the Edison Wastewater Treatment Facility in Edison, Ga. Kruger will furnish the state's first AnoxKaldnes MBBR LagoonGuard system in upgrading the plant with a new secondary treatment train. The system is designed to treat an average daily flow of 250,000 gpd and will meet effluent ammonia limits of less than 5 mg/L.

### TrojanUV to supply disinfection system for Greater Chicago district

TrojanUV will install its newest UV disinfection system, the TrojanUV-Signa, at the Metropolitan Water Reclamation District of Greater Chicago (MWRD). The system is designed for large-scale wastewater disinfection. The company will supply 14 UV banks with Solo Lamp technology. The Chicago system will have a capacity of 450 mgd, making it one of the 10 largest wastewater treatment plants in the United States. The UV system, to be operational in 2015, was chosen for benefits including low number of lamps required, ease of operation and maintenance, low capital and operating cost, and suitability for seasonal operation.

### CH2M HILL to maintain Arkansas wastewater treatment plant

CH2M HILL won a five-year contract to manage a Berryville (Ark.) wastewater treatment facility as that city aims to protect its water system. The firm began operating and maintaining the city's wastewater system last September and has trained former city personnel now working for the firm on safety, laboratory analysis, sampling and control, maintenance and regulatory compliance.

### Xylem wins \$2.7 million contract for New Jersey stormwater drainage system

Xylem won a \$2.7 million contract to supply the equipment and technology for a stormwater drainage system to protect against future storm damage along Route 35 on the New Jersey coastline. The system is a key part of a \$265 million reconstruction program that follows the damage caused by Superstorm Sandy in October 2012. The drainage system will consist of 47 Flygt Slimline pumps and 27 smaller Flygt submersible N-pumps in nine pump stations at intervals along a 12-mile stretch of road that was severely damaged by the storm. Flygt MultiSmart pump controllers will ensure efficient operation of the system. Each pump station will be able to move 25,000 to 35,000 gpm. The system is to be in operation before summer 2014. **tpo**

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**BUSINESSES**

**Wastewater Treatment Plant Opportunity – Acquisition, Lease or Partnership:** AG Global Canada, L.P. is offering for sale, lease, or partnership an aerobic wastewater treatment plant (the “WWTP”) located at 201 MacDonald Road in Collingwood, Ontario. The WWTP occupies 4.1 acres and is equipped with aeration basins, clarifiers and dissolved air flotation (“DAF”) unit operations. The WWTP is a two-stage activated sludge plant with primary settling capability, final clarification with dual mode DAF/conventional settler clarifiers and aerobic digestion for waste activated sludge solids reduction. It is designed to remove an average 6,000 kilograms per day of chemical oxygen demand from up to 1,500 m3 per day of influent flows and produce a final effluent with less than 300 milligram per litre cBOD5, which is less than 350 milligram per litre total suspended solids. Expressions of interest should be directed to Michael Beattie at AG Global. Offers must be received by March 15, 2014 and are subject to AG Global’s Terms and Conditions of Sale. The highest or any offer may not be accepted. AG Global Canada reserves the right to accept offers prior to March 15, 2014. A Confidential Information Memorandum is available from AG Global upon request. For additional information please contact: AG GLOBAL CANADA, L.P., 201 MacDonald Road, Collingwood, Ontario L9Y 4J1 Attention: Michael Beattie. Tel: 705-443-8201 ext. 299; Fax: 775-256-1547; Email: mbeattie@agglobalco.com; www.agglobalco.com (o03)

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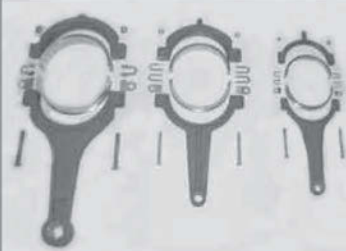
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## people/awards

The **Town of Clarkdale, Ariz.**, dedicated a new wastewater treatment plant, culminating an effort that spanned more than 25 years. The plant will process 350,000 gpd.

**Rick Crosby** and **John Burn** were elected to serve on the Mount Pleasant (S.C.) Waterworks Commission.

**Pat O'Neill** was promoted to wastewater treatment plant superintendent in Chatfield, Minn., after the retirement of **Darryl Haner**.

New Martinsville wastewater operator **Gary Young** was named the West Virginia Chief Wastewater Operator of the Year. He is the only repeat recipient (he also received the award in 2003).

**Manhattan, Kan.**, announced the completion of a \$23 million expansion and upgrade at its wastewater treatment plant. The project boosts flow capacity at the plant from 8.7 mgd to 11 mgd.

**Christina Galliher** was named as chief operator at the Penn Yan (N.Y.) Wastewater Treatment Plant.

**Vanessa Leiby** was named as the executive director of the Water and Wastewater Equipment Manufacturers Association. She succeeds **Dawn Champney**, who retired.

The **City of Florence, S.C.**, dedicated its new \$100 million wastewater management facility, which increases treatment capacity from 15 mgd to 22 mgd.

The **City of Blue Lake** received the Wastewater Treatment Plant of the Year Award for the North Coast Region from the California Water Environment Association.

The **University of South Florida** wastewater team took first place in the student design competition at WEFTEC 2013.

*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](mailto:editor@tpomag.com).*

## education

### Alabama

The Alabama Water Environment Association has a Collection System Operators Seminar March 25 in Huntsville. Visit [www.awea-al.com](http://www.awea-al.com).

### Arkansas

The Arkansas Environmental Training Academy is offering these courses:

- March 3-6 – Class II Wastewater, Camden

## CALENDAR OF EVENTS

### March 9-21

Water Environment Federation 2014 Water and Wastewater Leadership Center, Kenan-Flagler Business School, University of North Carolina, Chapel Hill. Visit [www.wef.org](http://www.wef.org).

### March 11-14

Water Environment Federation Collection Systems 2014: Collection on the Chesapeake, Baltimore Convention Center. Call 703/684-2441 or visit [www.wef.org](http://www.wef.org).

### March 18

Wisconsin Department of Natural Resources Spring Biosolids Symposium, Stevens Point. Visit [www.dnr.wi.gov](http://www.dnr.wi.gov).

### March 29-April 2

Missouri Water Environment Association/American Water Works Association Joint Annual Conference, Osage Beach. Visit [www.mwea.org](http://www.mwea.org).

### April 6-9

Alabama Water Environment Association Annual Conference, Orange Beach. Call 205/349-0067 or visit [www.awea-al.com](http://www.awea-al.com).

### April 6-10

Florida Water Resources Conference, Coronado Springs Resort, Lake Buena Vista. Event is a joint conference of the Florida Section of the American Water Works Association, the Florida Water Environment Association and the Florida Water

and Pollution Control Operators Association. Visit [www.fwea.org](http://www.fwea.org).

### April 14-16

Illinois Association of Water Pollution Control Operators Annual Conference, Crowne Plaza, Springfield. Visit [www.iawpco.org](http://www.iawpco.org).

### April 16-17

Nebraska Water Environment Association Great Plains Conference, Embassy Suites, LaViasta. Visit [www.ne-wea.org](http://www.ne-wea.org).

### April 22-24

Nevada Water Environment Association Annual Conference, location to be announced. Visit [www.nvwea.org](http://www.nvwea.org).

### April 22-24

Alaska Water Wastewater Management Association Annual Conference, Centennial Hall, Juneau. Visit [www.awwma.org](http://www.awwma.org).

### April 27-30

Arkansas Water Works and Water Environment Association Annual Conference, Hot Springs. Visit [www.awwwewa.org](http://www.awwwewa.org).

### April 29-May 2

California Water Environment Association Annual Conference, Santa Clara Convention Center. Call 510/382-7800 ext. 115, or visit [www.cwea.org](http://www.cwea.org).

### May 3-6

British Columbia Water & Waste Association Annual Conference and Trade Show, Whistler. Visit [www.bcwwa.org](http://www.bcwwa.org).

### May 12-16

New Jersey Water Environment Association Annual Conference, Bally's Atlantic City. Visit [www.njwea.org](http://www.njwea.org).

### May 18-21

Water Environment Federation Residuals and Biosolids 2014: Sustainability Made Simple/Facilitating Resource Recovery, Austin (Texas) Convention Center. Call 703/684-2441 or visit [www.wef.org](http://www.wef.org).

### June 5-6

Canadian Biosolids and Residuals Conference, Sheraton Wall Centre, Vancouver, British Columbia. Visit [www.acwwa.ca](http://www.acwwa.ca).

### June 22-25

Michigan Water Environment Association Annual Conference, Boyne Mountain Resort, Boyne Falls. Visit [www.mi-wea.org](http://www.mi-wea.org).

### Aug. 26-29

Ohio Water Environment Association and American Water Works Association Joint Conference, Hilton Columbus Downtown. Visit [www.ohiowea.org](http://www.ohiowea.org).

- March 18-20 – Advanced Industrial Wastewater, Fayetteville
  - March 25-27 – Advanced Industrial Wastewater, Hot Springs
  - April 8-9 – Basic Industrial Wastewater, Fayetteville
  - April 21-24 – Class II Wastewater, Burdette
  - April 28-30 – Class I Wastewater, Hot Springs
  - May 12-20 – Basic Industrial Wastewater, Fort Smith
  - May 19-20 – Basic Industrial Wastewater, Camden
  - May 27-June 5 – Class I Wastewater, Camden
- Call 870/574-4550 or visit [www.sautech.edu/aeta/schedule.aspx](http://www.sautech.edu/aeta/schedule.aspx).

## Florida

- The University of Florida TREEO Center offers these courses in Gainesville:
- March 11-12 – Sequencing Batch Reactor Operation: Make it Work for You
  - March 18-20 – Activated Sludge Process Control and Troubleshooting
  - April 29 – The Science of Disinfection
  - April 30 – Energy Conservation at Water and Wastewater Treatment Facilities
  - May 1 – Dissolved Oxygen and Oxidation Reduction Potential Training
  - June 17-19 – Microbiology of Activated Sludge
- Visit <http://www.treeco.ufl.edu/wastewater-courses.aspx>.

The Florida Water & Pollution Control Operators Association will hold its annual Spring State Short School March 24-28 at Indian River State College in Fort Pierce. Visit [www.fwpcoc.org](http://www.fwpcoc.org).

## Kansas

- The Kansas Water Environment Association is offering these courses:
- March 5-6 – Wastewater Collections, Hays
  - March 6 – Introduction to Water and Wastewater Conveyance, Phillipsburg
  - March 14 – Applied Math for Wastewater, Dodge City
  - March 21 – Wastewater Stabilization Lagoons, Syracuse
  - March 26 – Small Wastewater Systems, Goodland
  - April 2 – An Examination for Your Safety, Garden City
  - April 2-3 – Safety, Manhattan
  - April 4 – Wastewater Treatment, Pratt
  - April 8 – An Examination of Your Ethics, Garden City
  - April 8-9 – Lift Stations, Sedgwick
  - April 16-17 – Wastewater Stabilization Ponds, Lagoons and Lift Stations, Great Bend
  - April 17 – Wastewater Stabilization Lagoons, Hays
  - April 22 – Wastewater Stabilization Lagoons, Scott City
  - April 22-23 – Wastewater Stabilization Ponds, Pomona
  - April 23-24 – Utility Management Skills, Fort Scott
- Visit [www.kwea.net](http://www.kwea.net).

## Michigan

The Michigan Water Environment Association has a biosolids training seminar March 11-12 in Big Rapids. Visit [mi-wea.org](http://mi-wea.org).

## Ohio

The Ohio Water Environment Association is offering these courses in Lewis Center:

- March 13 – Government Affairs Workshop
  - May 1 – Collection Systems Workshop
  - May 21-22 – Operations/Lab Analysis Workshop
- Visit [www.ohiowea.org](http://www.ohiowea.org).

## Virginia

- The Virginia Water Environment Association is offering these courses:
- Apr. 30-May 1 – Education Conference, Richmond
  - June 12-13 – Wastewater and Collection Systems Operator Conference, Wintergreen
  - July 28-29 – Lab Practices Conference, Charlottesville
- Call 804/332-5286 or visit [www.vwea.org](http://www.vwea.org).

## Wisconsin

The University of Wisconsin Department of Engineering-Professional

Development is offering these courses in Madison:

- March 24-25 – Upgrading Your Sanitary Sewer Maintenance Program
  - March 26-28 – Wastewater Pumping Systems and Lift Stations
  - April 15-17 – Nutrient Removal Engineering: Phosphorus and Nitrogen in Wastewater Treatment
- Visit <http://epdweb.engr.wisc.edu>.

The Wisconsin Department of Natural Resources is offering these courses:

- March 4-5 – Phosphorus Removal-Intro and Advanced, Janesville
  - March 10-14 – General Wastewater Treatment, Intro and Advanced, Green Bay
  - March 18-19 – Ponds and Lagoons, Intro and Advanced, Black River Falls
  - March 24-28 – General Wastewater Treatment, Intro and Advanced, Chippewa Falls
  - March 26-28 – Wastewater Pumping Systems and Lift Stations, Madison
  - April 9-10 – Activated Sludge, Introduction and Advanced, Oconomowoc
  - April 15-17 – Nutrient Removal Engineering: Phosphorus and Nitrogen in Wastewater Treatment, Madison
  - April 15-17 – Lab Intro, Wausau
  - April 22-23 – Disinfection, Intro and Advanced, Green Bay
  - April 28-29 – Primary Treatment, Intro and Advanced, Chippewa Falls
  - April 30-May 1 – Lab, Advanced, Chippewa Falls
  - May 6-8 – Pumps and Motors, Madison
  - May 13-14 – Advanced Asset Management Practices for Water and Wastewater, Madison
- Visit <http://dnr.wi.gov.tpo>


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**"I think USABlueBook is great, and everyone I talk to seems to feel the same way I do."**

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Matt Green  
Operator  
City of Loganville WWTP  
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