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APRIL 2011

**In My Words: Prisoners
learn the treatment business**

PAGE 36

**Greening the Plant:
A small Wisconsin
community turns
to wind power**

PAGE 24

**Tech Talk:
Aeration improvements
in Bowling Green, Mo.**

PAGE 34

Forward Thinking

**MIKE TURLEY'S VISION HELPS HIS
VILLAGE PREPARE FOR THE FUTURE
AND KEEPS HIS TEAM ENGAGED**

PAGE 20





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advertiser index

APRIL 2011

AllMax Software, Inc.	50	ITT Water & Wastewater – Flygt Products	3
ATL		JDV Equipment Corporation	33
Analytical Technology, Inc.	52	Komline-Sanderson	50
Aqua-Aerobic Systems, Inc.	7	Markland Specialty Engineering Ltd.	11
Ashbrook Simon-Hartley	51	Meltric Corporation	13
Blue-White Industries	4	National Filter Media	49
Carylon Corporation	17	Ovivo	2
ClearSpan Fabric Structures	23	Pentair Technical Products	25
Detcon, Inc.	31	Prime Solution, Inc.	29
Environmental Dynamics, Inc.	35	Pulsar Process Measurement, Inc.	13
Flo Trend Systems, Inc.	31	Rig-A-Lite	19
Hach Company	5, 50	Sentry Equipment Corp.	39
HF scientific	19	Simple Solutions Distributing, LLC	50
Huber Technology, Inc.	9, 11, 13	The Bilco Co.	8
		WeirWasher Automated Cleaning Systems	29
		CLASSIFIEDS	50

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contents

April 2011

features

- 10 HEARTS AND MINDS: GREASE IS THE WORD**
Warwick Sewer Authority gets school kids involved in the never-ending war on FOG in the sewer system.
By Linda Krause
- 12 PLANTSCAPES: REFLECTING HISTORY**
City of Geneva (Ill.) staff members team up to restore a pond at the wastewater treatment plant originally established in 1933.
By Jeff Smith
- 14 TOP PERFORMER – BIOSOLIDS: DONE JUST RIGHT**
A Class A biosolids process keeps Stewartstown (Pa.) operations simple — and keeps area farmers coming back for more.
By Larry Trojak
- 20 TOP PERFORMER – OPERATOR: FORWARD THINKING**
Mike Turley's vision helps the Village of New Lenox (Ill.) prepare for the future and keep treatment plant personnel engaged and on board.
By Scottie Dayton
- 24 GREENING THE PLANT: WIND-POWERED**
A small Wisconsin village installs a pair of wind turbines at its treatment plant that could make electricity a source of revenue, rather than an expense.
By Doug Day
- 26 TOP PERFORMER – PLANT: WORKING HAND IN HAND**
An Illinois village makes sure its wastewater treatment capacity keeps pace with development in a fast-growing suburban community.
By Jim Force
- 32 HOW WE DO IT: SMALL PACKAGE, BIG RESULT**
An IFAS process helps a Colorado Sanitation District meet the challenge of a tougher permit limit on effluent ammonia.
By Scottie Dayton
- 34 TECH TALK: AN AIR OF EFFICIENCY**
A Missouri plant knocks down energy consumption and costs with aeration improvements including variable-frequency drives and SCADA control.
By Daniel A. Gummertsheimer and John Harris
- 36 IN MY WORDS: BEYOND THE WALLS**
A minimum-security prison's treatment plant sends clean water to the environment and better people back into society.
By Doug Day
- 39 TIPS AND TRICKS: P REMOVAL: A BETTER WAY**

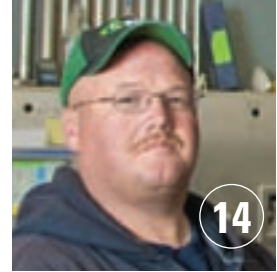
on the cover

Mike Turley, supervisor of Waste Water Reclamation for the Village of New Lenox Ill., oversees three treatment plants with a combined 3.6 mgd flow. He considers treating wastewater one of the most valuable services municipalities provide to their residents. (Photography by Michael Kelly)

20



26



14



36



14

departments

- 8 LET'S BE CLEAR: OBSERVING EARTH DAY**
Will your treatment plant mark April 22 with any sort of public commemoration? Let us share your event with our readers.
By Ted J. Rulseh, Editor
- 38 CASE STUDIES: MONITORING AND INSTRUMENTATION**
By Scottie Dayton
- 40 PRODUCT FOCUS: MONITORING AND INSTRUMENTATION**
By Benjamin Wideman
- 45 INDUSTRY NEWS**
- 46 PRODUCT NEWS**
Product Spotlight: Jet-Action Mixing System Keeps Tank Solids Suspended
By Ed Wodalski
- 48 WORTH NOTING**
People/Awards; Education; Calendar of Events

COMING NEXT MONTH: MAY 2011

Special Issue: Annual Company Directory:

- Top Performer – Plant: Upgrading plant and effluent in Madison, Ala.
- Top Performer – Operator: Dave Kalin, Town of Webster, N.Y.
- Top Performer – Plant: Staff-driven improvements in Tarpon Springs, Fla.
- How We Do It: Energy software at Western Racine County (Wis.) Sewerage District
- In My Words: Minnesota Pollution Control Agency operator training unit
- Greening the Plant: Digester gas and cogeneration in Waco, Texas
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let's be clear

Observing Earth Day

WILL YOUR TREATMENT PLANT MARK APRIL 22 WITH ANY SORT OF PUBLIC COMMEMORATION? LET US SHARE YOUR EVENT WITH OUR READERS.

By Ted J. Rulseh, Editor

I was a senior in high school at the time of the first Earth Day on April 22, 1970. In observance, I joined a small group of classmates who organized a Saturday morning cleanup of the beach in our Lake Michigan town.

Apparently we didn't organize very well, because no one outside our group showed up, and even some of our own fellow planners weren't there. We gave up in frustration and went home.

Thankfully, Earth Day took deeper root nationally and worldwide than it did in our community that day. Progress on clean air, water and land has been remarkable, and it continues. To cite just one example, diesel vehicle engines starting in 2010 have selective catalytic reduction systems that drive exhaust oxides of nitrogen (NOx)

down to near zero. That's on top of particulate filters that clean the soot from stack emissions.

Once these new-generation engines become dominant in the population — that will take time — our air will be a lot cleaner. Of course, one of the next environmental frontiers is nutrient removal at wastewater treatment plants.

GROWTH BY STAGES

It's been interesting to observe progress on the environment since the first Earth Day, launched by Gaylord Nelson, a U.S. Senator from my home state of Wisconsin. The early 1970s of course saw passage of the Clean Air Act, the Clean Water Act, and a great deal more landmark legislation.

Another big wave hit around 1990 and the 20th Earth Day as recycling took hold and became a national and global priority. About a decade later came the sustainability movement. Then in 2010 we began seeing truly serious attempts at legislation and social action to combat greenhouse gases and climate change.

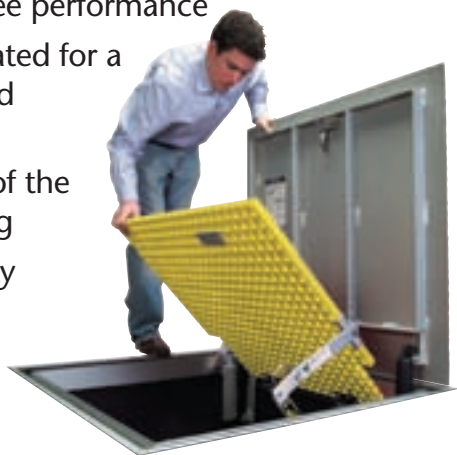
It seems at every stage there has been conflict — proposed regulations met with doom-and-gloom prophecies of bankrupted businesses, devastated taxpayers, and wrecked economies. Of course, the predictions didn't come true.

There are rumblings now in some quarters that nutrient reduction in wastewater will have crippling costs. Most likely

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SEE FOR YOURSELF

Starting this month, we're including GPS coordinates, where possible, for the treatment plants we feature in our Top Performer series. The coordinates will appear in the summary box that accompanies each story. This way, if you want to have a look at one of the plants we feature, you can go to Google Earth and get an aerial view.

We hope you enjoy this new offering, which came at the suggestion of Andy Heiliger, a Class II wastewater operator at the Plainfield (Ind.) Wastewater Treatment Facility.

that won't be the case, the treatment plants will be upgraded, and our waters will be healthier by one more significant degree.

WHO'S ON BOARD?

Businesses seem fully on board with sustainability now. In fact it's fair to say large companies are ahead of the politicians and are being more responsible than many or most individual homeowners. Some are notably leading the way on energy efficiency and greenhouse gas reduction.

For one example: Few high-profile companies today erect a new corporate headquarters or other major building that isn't certified green. How many of us take special pains to build green houses or to green the ones we already own?

A lot of all this progress must be credited to environmentalists, who have been derided for years as a bunch of tree-hugging, scruffy-haired, socialistic radicals. In fact they're still portrayed that way amid the debate about climate change.

But think for a minute. Even if you don't believe that climate change is real or is caused by humans, what is the downside to cutting carbon dioxide emissions by being more

Of course, treatment plant operators have been part of all the environmental progress — not by being political, not by holding demonstrations, just by quietly, effectively getting the job done, and in a great number of cases doing the job much better than the law says they have to.

efficient, using renewable sources, and buying less fuel produced by unstable countries that don't like us? Maybe the radicals will end up being right again.

Anyway it's hard to ridicule them when you look back and compare how things were 41 years ago with how they are now.

THE ROLE OF OPERATORS

Of course, treatment plant operators have been part of all the environmental progress — not by being political, not by holding demonstrations, just by quietly, effectively getting the job done, and in a great number of cases doing the job much better than the law says they have to. So members of the profession have every right and reason to celebrate Earth Day.

Are you celebrating this year? Tell us how your plant is marking the occasion, whether just among your own staff or in some sort of outreach to the community. Send a note to editor@tpomag.com that describes what you did. Include a picture or two if you can. We'll publish some of the material in an upcoming issue of *TPO*. **tpo**

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Grease Is the Word

WARWICK SEWER AUTHORITY GETS SCHOOL KIDS INVOLVED IN THE NEVER-ENDING WAR ON FOG IN THE SEWER SYSTEM

By Linda Krause

The Warwick (R.I.) Sewer Authority is addressing a long-standing problem with an innovative solution. The agency has teamed up with Sherman Elementary School students to cut down on grease entering the collection system.

The Turn Grease Into Fuel (TGIF) program converts used cooking oil into biodiesel, which is then donated to families who can't afford heating fuel. The conversion of grease into Bioheat fuel is done by Newport Biodiesel.

TGIF was started in Westerly by the Junior Westerly Innovations Network (WIN) team. Last winter, the initiative in Westerly collected 3,000 gallons of used grease each month and donated more than 4,000 gallons of biofuel to those in need.

Warwick is a good market for TGIF because residents are passionate about the city's rigorous recycling program. Because Warwick spends \$250,000 each year to clean its sewer lines, TGIF could bring significant cost savings.

HELPING THE SYSTEM

In a tour of Sherman Elementary students at the Warwick Wastewater Treatment Plant, lead operator Gwinlin Cox Jr. showed how

"What is amazing is when you see the kids excited. Then it is really inspiring. If these kids can do this in sixth grade, imagine what they will be able to accomplish as adults."

BETTYANNE ROSSI



PHOTOS COURTESY OF WARWICK SEWER AUTHORITY



Two students recycle grease as part of the Warwick Sewer Authority's TGIF program.

What's Your Story?

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

wastewater is treated and the benefits of having less grease in the system. "Your mother cooks dinner, then the grease floats here," he said.

Cox, who is on call around the clock, talks enthusiastically about TGIF and how it will save work for him and his crew. At present, operators are sent out once or twice a week with the flushing truck to deal with grease problems in the lines.

Cox hopes TGIF will cut down on the grease-cleaning expeditions and the laborious cleaning process that's needed when grease makes its way to the treatment plant's primary sedimentation tanks.

Also excited about the program is BettyAnne Rossi, pretreatment coordinator and laboratory director. "We had a tour today with the kids and I am still pumped up – but it's my career," she says. "What is amazing is when you see the kids excited. Then it is really inspiring. If these kids can do this in sixth grade, imagine what they will be able to accomplish as adults."

CHOSEN ON MERIT

The authority chose students from Sherman Elementary for the project because they were already involved in recycling programs in the city. In one case, the students questioned why bottle caps weren't accepted for recycling, and they convinced Rhode Island Resource Recovery Corporation, the quasi-public state agency responsible for solid waste, to accept them.

In TGIF, the students are focusing on residents near their school and have set up four recycling stations for the oil. Rossi says that if each household in Warwick removed only one teaspoon of oil from its waste every day, there would be 15 fewer 55-gallon barrels per month of grease going into the collection system.

The kids are getting homeowners involved by creating flyers and how-to information sheets. They are working with Public Works and the fire department to set up large recycling containers, which they decorate with the Sherman Elementary mascot, Sammy the Shark.

Warwick Sewer Authority lead operator Gwinlin Cox Jr. with students on a wastewater treatment plant tour.

So far, all locations are at fire stations, which are manned at all hours (helping to prevent vandalism).

LOOKING TO RESTAURANTS

There have been issues with fats, oil and grease in the past in residential areas of Warwick. The true impact of TGIF will not be felt until it is implemented on the outskirts, where some grease "hotspots" are located. Certain neighborhoods have ethnic populations that use more oil for cooking, and the authority intends to reach out to those areas.

Another component to be added in the future is curbside recycling. At present, some residents find it inconvenient to drop off grease at the recycling stations. Rossi believes even more grease will be collected if residents can place it at the curb with other recyclables.

Once the residential phase of TGIF is in place, the authority plans to target the city's 250 restaurants. Minor changes in restaurant procedures, such as adding grease traps or external grease interceptors and removing garbage grinders so that solid materials are disposed of in the trash, can have major benefits to the sewer system.

Rossi is confident the kids will remain committed. "You know how kids are," she says. "If they are passionate about something you can't keep them quiet!"

Previously, the authority's only way to deal with grease in the commercial sector was to hand out violation notices and fines. Rossi would rather say, "Thanks for recycling." In the end, she expects TGIF to help the community, benefit the restaurants, and best of all, help residents having trouble paying for heat.

Finally, it will benefit the Warwick Sewer Authority. Less grease reaching the treatment plant means less pipe cleaning and preventive maintenance. Cox says anything that improves the quality of the water leaving the plant is good for the people.

"What kids can do nowadays is unreal," he says. **tpo**

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The pond at the Geneva Wastewater Treatment Facility is located along the Fox River and bike trail.

PHOTOS COURTESY OF CITY OF GENEVA

Reflecting History

CITY OF GENEVA (ILL.) STAFF MEMBERS TEAM UP TO RESTORE A POND AT THE WASTEWATER TREATMENT PLANT ORIGINALLY ESTABLISHED IN 1933

By Jeff Smith

Pride runs deep at the wastewater treatment plant in the City of Geneva, Ill., and a 20-foot-diameter fish and wildlife pond reflects that pride for visitors to the plant, and for bicyclists and hikers who enjoy the pathway that runs next to the plant.

The pond dates to 1933, when the city built its treatment plant under the supervision of Juanita Martin, a 23-year-old woman who brought the project online within budget and on time.

"Juanita signed contracts, hired men, and bought materials for the job," says Bob Van Gyseghem, superintendent of water and wastewater. "And she directed day laborers with the same vim and tact she used when dealing with bankers and government inspectors."

One federal inspector pronounced her concrete work comparable to the best in the state. Her father's construction company handled the project, which included a decorative rock garden and a waterfall. City officials were so satisfied with her work that they publicly dedicated and christened the area Juanita Park.

BRINGING IT BACK

After a plant expansion in the 1970s, a lack of upkeep led to the pond's deterioration, so it was filled in with gravel. However, another expansion in 2004 at the single-stage activated sludge plant inspired a proud staff to resurrect the pond for the enjoyment of visitors, and to further recognize the accomplishments of Juanita Martin.

Staff members donated their time to rehabilitate the 6-foot-deep pond. "Workers were here on Sat-

urdays and Sundays and at no cost to the plant," says plant supervisor Dan Dobnick. They laid natural limestone from a nearby quarry, built a small waterfall, planted flowers and grasses, and added a number of colorful Japanese koi and goldfish.

"We're fortunate here in Geneva to have a lot of talented people in our departments," says Van Gyseghem. "We had people from our water department, our collection department, and maintenance department all come down to help us make the pond look as it appears in photos taken in 1933."

SHOWING THE WAY

The 2004 plant expansion, which increased design average flow to 5 mgd and design maximum capacity to 12.5 mgd, also inspired a new 4- by 8-foot sign that identifies the entrance road to the plant. The plant shared the \$5,000 cost of the sign with the Geneva Park District because access to a city park and the bike trail is through that same entrance road.

"Making a nice new sign for the front entrance to the plant was one of the final touches to our expansion," says Van Gyseghem. The sign stands along a major thoroughfare in this city of 22,000, which straddles the Fox River. The hand-carved oak sign includes the image of a duck in its natural habitat, since ducks nest each spring near the plant clarifiers.

"The treatment plant has always been an area of duck habitat, and each season we see a hatch of anywhere from 15 to 20 wood ducks," says Dobnick. "The sign is in a perfect spot on top of a hill. It's seen by everyone who passes by in cars, and by everyone who uses the road to our plant to visit nearby Island Park, the bike path or the Fox River."

Future plans include installing a gate in the iron fence that separates the bike path from the plant, allowing plant visitors to enjoy the pond and use it as a rest stop along the trail. **tpo**

Share Your Ideas

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“The old plant served its purpose, there’s no denying that. However, the Class B biosolids could not be applied in winter and could not be kept on hand long before odor and flies became an issue.”

DENNIS SARPEN



Stewartstown water/sewer supervisor Ira Walker Jr. (left), with Dennis Sarpen, president of James R. Holley & Associates, consulting engineers on the 2007 plant expansion. (Photography by Matthew Pilachowski)

The biosolids process includes a sludge thickener from Suburbia Systems (Unifilt) with drive assembly from EMCO Flow Systems. Sludge is pumped from this tank to a belt press on the second level of the plant.



A CLASS A BIOSOLIDS PROCESS KEEPS STEWARTSTOWN (PA.) OPERATIONS SIMPLE —
AND KEEPS AREA FARMERS COMING BACK FOR MORE

Done *Just Right*

By Larry Trojak

ALMOST EVERYTHING ABOUT THE STEWARTSTOWN Borough Wastewater Treatment Plant speaks to its diminutive size. Though located on 20+ acres, the plant itself occupies less than an acre.

It's designed for 740,000 gpd and is permitted for only 625,000 gpd. And when the plant was expanded in 2007, the cost was a modest \$4.2 million. But what the plant lacks in size, capacity and cost, it makes up for in performance.

In fact, since the expansion, the facility has dramatically improved the quality of effluent discharged to Ebaugh Creek. Ammonia levels which once repeatedly exceeded 7 mg/l, are now routinely less than 1 mg/l, and total nitrogen levels, previously estimated at 25 mg/l, have been reduced to less than 6 mg/l.

The plant now also uses a heating and lime stabilization process to create about 130 dry tons per year of Class A biosolids, all used by area farmers.

OUT WITH THE OLD

Located in south central Pennsylvania, 30 miles from Baltimore, Stewartstown Borough is a quaint community nestled amid rolling hills and family farms. Since 1978, the treatment plant has served the borough and neighboring areas, with a total population of fewer than 2,000, according to Dennis Sarpen, president of James R. Holley & Associates, the consulting engineers on the 2007 expansion.

"The plant takes in material from the borough as well as parts of nearby Hopewell Township that are zoned for higher-density residential, but couldn't qualify for onsite septic and well systems," he says.

In addition, the plant takes in leachate from the York County Solid Waste & Refuse Authority landfill in Hopewell Township. The landfill collects the leachate in a liner system, directs it to a lagoon, performs pretreatment, and then pumps the liquid into the borough's collection system. That represents

10,000 to 15,000 gpd — a bit less if the area has been rain-free for a time.

The old wastewater treatment facility generated a Class B biosolids which, while approved for land application, presented so many challenges that the borough needed an alternative treatment method.

"The old plant served its purpose, there's no denying that," Sarpen says. "However, the Class B biosolids could not be applied in winter and could not be kept on hand long before odor and flies became an issue." The plant also needed to meet tougher discharge requirements.

HIGH EFFICIENCY

The plant property includes mostly wetlands and hillsides, hardly ideal for an expansion. "We actually had to blast into a hillside to create a storage pad for the biosolids product," says Ira Walker, borough water/sewer supervisor.

"We actually had to blast into a hillside to create a storage pad for the biosolids product."

IRA WALKER

"We did a lot to save what we could from the previous plant, using a pair of existing tanks as part of the sequencing batch reactor (SBR) process, for example, and we built upon that. In the end, we had a nice, compact plant that does all that we want it to do and is giving us a far better byproduct than we had before."

In that small footprint, wastewater is first screened through mechanically cleaned bar screens with 3/8-inch openings from Hydro-Dyne Engineering and then passed on to a pair of Aqua-Aerobic Systems SBR units where the wastewater is mixed and aerated. "That is one of the big differences between this plant and the one it replaced," says Sarpen.



profile **Stewartstown Borough (Pa.) Wastewater Treatment Plant**

BUILT:	1978 (upgraded in 2007)	
FLOWS:	740 gpd (design)	
TREATMENT LEVEL:	Secondary	
TREATMENT PROCESS:	Sequencing batch reactor with nutrient removal	
RECEIVING WATER:	Ebaugh Creek	
STAFF:	Ira Walker Jr., water/sewer supervisor; Tracy Baldwin, sewer operator; Wayne Bush and Tommy Shaull, water/sewer operator trainees	
BIOSOLIDS PROCESS:	Schwing Bioset (heat and lime stabilization)	
BIOSOLIDS VOLUME:	130 dry tons/year	
BIOSOLIDS USE:	Land application of Class A material	
GPS COORDINATES:	Latitude: 39°44'43.02"N; Longitude: 76°36'17.05"W	
WEBSITE:	www.stewartstown.org	

"The previous plant oxidized the ammonia to nitrate, but it was still a form of nitrogen. The plant was then free, and permitted, to discharge into the creek. However, the Chesapeake Bay requirements that are in place now say that Stewartstown must have lower levels of both total nitrogen and phosphorus. The SBR makes that happen, leaving low phosphorus, low solids and low BOD."

While the previous plant used chlorine disinfection, the new one uses a 96-lamp UV system from the UV Technologies Division of Calgon Carbon Corp. "Most times of the year, discharge from the plant is required to be at no more than 200 fecal coliform units per 100 ml," says Sarpen. "Stewartstown's numbers are in the single digits and sometimes in the low double digits. It's a much cleaner effluent entering the creek."

SOLIDS TREATMENT

Biosolids at Stewartstown are first run through a Suburbia Systems (Unifit) thickener (with an EMCO Flow Systems drive assembly), then pumped to an upper level in the building to be dewatered to about 17 percent solids in a 1.7 meter X-roll belt press from Envirodyne Systems. The dewatered material drops down to the first floor and enters a hopper at the start of the Schwing Bioset process that produces Class A material.

Quicklime and sulfamic acid are added to increase the temperature and the pH. A Schwing Bioset KSP 10V(K) piston pump sends the blended product, now about 35 percent solids, on to a reactor, where the temperature and pH are raised to sufficient levels to kill off pathogens.

"Schwing Bioset specs say it takes 30 minutes at 158 degrees F to make Class A biosolids," says Walker. "But material here probably gets a couple of hours in that reactor before exiting to a truck. When the truck is filled, we haul the material over to the storage pad to be dumped and stockpiled until one of the area farmers calls for a load."

Walker says the Bioset process is simple in design and operation and a good fit for a no-nonsense plant. "We have been really satisfied, both with the performance we've gotten out of the system and the support we've gotten from Schwing Bioset," he says.

"We've really only had one issue in the two years the system has been in place — a problem with the sensors in the lime storage silo — but it occurred just as a huge snowstorm was about to hit. Schwing Bioset had a man out here quickly. He replaced the sensors with a newer, better type of sensor, and we were back in operation before the snow fell."

MAKES NO SCENTS

Perhaps Stewartstown Borough appreciates reliable support because that reflects how the borough treats its own customers. The borough delivers the Class A biosolids to the farmers at no cost.

"We do so because we farmers also haul grain or corn in their trucks and might not necessarily want to mix the two," says Walker. "Plus we want to make it as easy as possible to get it to them."

Sarpen says providing the biosolids for land application is as good for the borough as for the farmers. The alternative, taking untreated sludge to the landfill, would be cumbersome and costly.

"The landfill would charge the plant anywhere from \$50 to \$60 per wet ton to take the sludge," says Sarpen. "If they were to take untreated material to them it would be at a point when it is 20 percent solids and 80 percent water. In terms of collection, transportation and disposal, that would be a huge cost to incur."

Walker adds, "Mind you, the system was designed with a contingency where the mere push of a button switches the direction of a screw auger,



UV disinfection system from Calgon Carbon Corp.

(continued)

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LEFT: The Stewartstown team includes, on steps, from the top, secretary Melissa Matthews, treasurer Stacy Myers, and sewer operator Tracy Baldwin; in front, from left, water/sewer supervisor Ira Walker Jr., water/sewer operator trainee Wayne Bush, James R. Holley & Associates president Dennis Sarpen, and water/sewer operator trainee Tommy Shaul. BELOW: Suburbia Systems (Unifilt) sludge thickener with EMCO Flow Systems drive assembly.



A silo serves the Schwing Bioset process, which produces Class A biosolids for use by area farmers.



PROVEN INNOCENT

When residents of Stewartstown detect a scent of anything coming from the wastewater treatment plant, they generally assume the source is the biosolids material stockpiled on the storage pad. A closer inspection almost always proves them wrong.

"Recently, one of our nearby residents called saying he thought he could smell an odor," says Ira Walker, borough water/sewer supervisor. "We invited him down and took him right to the storage pad, and he realized then that it wasn't coming from our stored solids at all. Schwing Bioset has brought people here from around the country, and each time the visitors are amazed at how little of an odor there is, how free of flies the area is."

"The treated solids have a real organic nutrient value, including lime, nitrogen and phosphorus which the farmers love. To answer or even anticipate any questions, we provide a fact sheet for the farmers with information such as where they should and shouldn't apply the biosolids product."

IRA WALKER

allowing the sludge to bypass the Bioset system. But I hope we never have to use it. This is a great system providing a nice product to area farmers."

SECOND TIME'S A CHARM

In 2009 alone, Stewartstown delivered more than 372 wet tons (130 dry tons) of Class A biosolids to area farms. Walker expected to surpass that tonnage in 2010.

"The treated solids have a real organic nutrient value, including lime, nitrogen and phosphorus which the farmers love," says Walker. "To answer or even anticipate any questions, we provide a fact sheet for the farmers with information such as where they should and shouldn't apply the biosolids product."

"We also make test data showing concentrations of pollutants in samplings readily available. We want to assure them in every way possible that they've made a good decision in taking this Class A biosolids for application."

Walker will never forget the first load of Class A the plant sent out of the newly expanded facility. The customer (still the borough's largest) was initially hesitant because he thought there would be a problem with flies and odor. "But after the first application, when he came back for seconds, we knew we were going to be all right." **tpo**

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FORWARD THINKING

MIKE TURLEY'S VISION HELPS THE VILLAGE OF NEW LENOX (ILL.) PREPARE
FOR THE FUTURE AND KEEP TREATMENT PLANT PERSONNEL ENGAGED AND ON BOARD

By Scottie Dayton

MIKE TURLEY CONSIDERS TREATING WASTEWATER ONE OF THE MOST valuable services municipalities provide to their residents.

Turley, 58, is supervisor of Waste Water Reclamation for the Village of New Lenox, Ill., overseeing three treatment plants with a combined 3.6 mgd flow. The effluent permits are some of the most restrictive in the state because the plants discharge to sensitive waters. Plant 1 discharges to Hickory Creek, one of the most pristine waterways in the Chicago area.

Turley has spent much of his career emphasizing that wastewater treatment is a keystone to advanced civilization and instilling its importance in his staff and to students in his classes at Joliet Junior College and Southern Illinois University. He also serves as a prime example of the career opportunities in the industry — he started as an operator and worked his way up to his present position.

Turley worked for six years with the DuPage County (Ill.) Department of Public Works before moving to New Lenox, where he has been for 25 years. At New Lenox, his accomplishments include developing a method to gauge the inflow and infiltration (I&I) entering Plant 1. He also created construction and inspection policies for new infrastructure and started a continuing education plan for the wastewater department.

His leadership has inspired loyalty: Many of his 11 team members have served 15 to 20 years or more, and the staff has a combined 159 years of experience.

In 2002, the Illinois Water Environment Association (IWEA) named Turley Best Operator of the Year. The Illinois EPA selected him as the 2003



Mike Turley, supervisor of Waste Water Reclamation for the Village of New Lenox, Ill.
(Photography by Michael Kelly)

Wastewater Operator of the Year, the highest honor for an operator in the state. Turley also won the American Public Works Association Chicago Chapter's 2005 Charles Nichols Award for environmental excellence. In 2010, he received the IWEA Golden Manhole Award for his professional contributions to the collection system industry.

NORMAL CIRCUMSTANCES

New Lenox built its first treatment plant in 1960 in the heart of the downtown business district. It was expanded in 1970, 1989, 1992, 1999 and 2005 to handle 2.5 mgd. As development moved south, Plant 2 was built in 1970 and updated in 1995 to treat 0.7 mgd.

Plant 3, designed for an average flow of 60,000 gpd and a maximum of 1.24 mgd, was built on the north side in 2002 with intent to serve an office complex and a hospital and retail outlets under construction. An anticipated residential expansion never happened, and a large subdivision sits vacant. The village also has 113 miles of sewers; 2,640 manholes; a two-acre stormwater lagoon; and 12 remote lift stations.

Meeting maintenance requirements is challenging for Turley's staff, but it gives them opportunities to expand their horizons and heighten their sense

of self-worth. "For little boys, the world is mud-luscious and puddle-wonderful, and there is no better place for that than treatment plants," says Turley, paraphrasing the poet e.e. cummings. "Good employees enjoy the challenge of multiple duties. Keep them busy, show them respect, offer advancement, and they're happy to stay."

Turley assigns an area of responsibility to every member. "I tell them what needs to be done, but they decide how to do it," he says. "Empower-

profile

**Mike Turley, Waste Water Reclamation Supervisor,
New Lenox, Ill.**

EXPERIENCE: 30 years

RESPONSIBILITY: Oversees three plants and collection system

EDUCATION: Liberal arts degree, Governors State University; water and wastewater studies at Joliet Junior College, Southern Illinois University, Penn State University, University of Wisconsin School of Engineering, and California State University

CERTIFICATION: Class 1 wastewater operator

GOALS: Provide quality customer service at a reasonable rate

GPS COORDINATES: Latitude: 41°30'54.46"N;
Longitude: 87°58'5.13"W

WEBSITE: www.newlenox.net

"Good employees enjoy the challenge of multiple duties. Keep them busy, show them respect, offer advancement, and they're happy to stay."

MIKE TURLEY

Mike Turley, part-time summer intern Zack Carlson, operator Mike Boban and senior operator Randy Schram set a Generac generator in place.



ment helps them realize the value of their work and function better as a team.” The staff stays connected through weekly meetings.

INNOVATION RULES

The policy has paid huge dividends, as members freely make suggestions and solve challenges using old-fashioned ingenuity. For example, in 2000, Plant 1 added a gravity thickener that layered solids in anaerobic conditions. The bound water returned to the plant, while the thickened solids went to aerobic digesters. The gravity thickener, however, had no odor control.

“The odor was so bad that the village considered abandoning the thickener,” says Turley. “The engineers’ estimate to cover the circular tank was \$80,000 to \$100,000, but my team figured they could do it for around \$8,000.” They built a frame out of two-by-fours, coated it with two-part epoxy, laid a Plexiglas cover over it, and caulked the seams. A pump drew the air into an underground biofilter.

The design worked well until ultraviolet rays from sunlight rotted the cover. At a staff meeting, Class 1 operator Paul Burris recalled that landfills used UV-resistant liners. Turley contacted MPC Containment Systems in Chicago and got his cover, then six more for the digesters. Two more digesters, added during the 2005 expansion, have concrete covers. Fifteen homemade odor-control units treat the drawn-off air.

In another instance, the staff corrected the lagoon’s chlorination system after two engineered designs failed. “In the first design, the flowmeter that turned on the chlorine was on the discharge side of the lagoon, so the 100,000-gallon chlorine contact system was full of unchlorinated water before the meter registered anything,” says Turley. “By the time the chlorine turned on, it couldn’t catch up.”

The engineers then built a traditional chlorine contact concrete tank on the other side of the flowmeter. Now chlorine turned on the minute there was flow. But that fix did not always produce water that met the 0.75 ppm free chlorine limit and the fecal coliform requirements.

So, the staff fashioned a plastic divider with a hole in the bottom and installed it near the end of the contact tank. A sump pump mixes liquid sodium bisulfate, injected at the hole, with water as it passes through and flows out the top of the tank. “Feeding chlorine enabled us to meet our fecal

“The village is unique in that our administrator, Russ Loebe, and public works director, Ron Sly, are Class 1 operators. It’s a blessing to have people who understand what I’m talking about when there is a problem.”

MIKE TURLEY

standards, while the bisulfate lowered our chlorine residual to meet our effluent chlorine residual standards,” says Turley.

FREE THINKING

Turley’s liberal arts degree from Governors State University provided a background in science, computer science, business management, finance, and public administration, but access to water and wastewater classes enabled him to advance through the ranks. To offer his team the same opportunities, Turley won approval from the village council for a continuing education program, paid for by the village.

“The staff can earn an associate in science degree or take courses in mechanical maintenance, then advance to a business management or public administration degree,” says Turley. For example, Burris earned his master’s in public administration while with New Lenox and is now assistant executive director of the East Orange Water Commission in Orange County, N.J.

Not content to keep education in-house, Turley began teaching environmental science classes at Joliet Junior College. He also taught short schools at Southern Illinois University to prepare students for their state Class 3 or 4 wastewater operator licenses.

In 1998, he added an advanced wastewater treatment course at Joliet for operators planning to take the state Class 1 and 2 license exams. A year later, he compiled and taught a course in collection system management that has been part of Joliet curriculum ever since.



The New Lenox team includes from left, Paul Webster, operator; Luke Miller, laborer; Randy Schram, senior operator; Dani Cieply, laborer; Jeremy Turrisi, operator; Kathy Baltz, operator; Mike Boban, operator; Keith McKeen, senior operator (sitting); Mike Turley, plant superintendent; Steve Helis, senior operator; and Devon Dempsey, laborer.

Advancement, empowerment, and monetary reward have kept turnover low and dedication high among Turley’s team. For example, Kathy Baltz, a Class I operator in charge of the laboratory, has been with the village 21 years, while Brian Williams, a Class 1 operator in charge of Plant 1, has been there 20 years.

IS THAT OUR WATER?

As the village expanded, Turley battled with how to measure flows to detect I&I. “I began by comparing our water sales with plant flows,” he says. “Anything arriving in the plant that we didn’t sell as water is excess.”

He determined the theoretical flow by dividing the 12-square-mile service area into subsections and counting the number of houses per section. Crews then used two portable flowmeters to monitor them. It took two years to determine actual flows.

Turley also looked at influent total solids and BOD, which should average 0.2 pounds per person per day. “It’s a time-consuming process,” he says. “We also do a lot of visual observations and sampling throughout the system for ammonia nitrogen and turbidity. Then we compare those numbers with the plant numbers. If turbidity and ammonia are much lower in one area, it’s probably due to I&I, and we concentrate our rehabilitation efforts there.”

The numbers prove the success of the program. In 2000, the effluent flow at Plant 1 was 1.6 mgd with 150 ppm total solids during wet weather. In 2009, the flow was 2.1 mgd with 234 ppm. “The flow is increasing because we



From left, intern Zack Carlson, laborer Luke Miller, Mike Turley, and intern Neil Andrews review the town's sewer maps for the summer sewer cleaning program.

PLANNING AHEAD

Frustrated with constant plant expansions and with developers tying into sewers too small for the flow, New Lenox supervisor of wastewater reclamation Mike Turley pushed for a plan showing the village's total possible expansion, treatment plant capacities and conveyance line sizes.

Village administrator Russ Loebe agreed, and the community hired Earth Tech Environmental Engineering (now AECOM) to create it. The village has used the plan since 1997 for all development.

"If the plan calls for a 24-inch line, that's what goes in, even though a 12-inch will suffice for now," says Turley. "Developers install the pipe at their expense, but get recapture when the next subdivision or development ties in. That prevents the village from laying out any cash and keeps New Lenox growing."

have more people, and the solids concentration should be going up because of less I&I," says Turley.

After crews worked hard to reduce I&I in one area, it shot back up when contractors built a subdivision with defective infrastructure. "That began our subdivision inspection policy, and my Class 1 maintenance man, Ken Brozovich, became the inspector," says Turley.

CONTROLLING PRODUCT

Turley also convinced the village engineer to let him review new subdivision blueprints to see if the designs worked from an operational perspective. The policy has prevented such errors as connecting a lateral with the sewer by running the line under a retention pond instead of around it.

"The village is unique in that our administrator, Russ Loebe, and public works director, Ron Sly, are Class 1 operators," says Turley. "It's a blessing to have people who understand what I'm talking about when there is a problem."

During the 2005 expansion, for example, Turley wanted recirculation on the solids handling system, but the engineers proposed the traditional

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approach — thicken the material before it went to the digester, then send it to storage. Loebe and Sly, knowing that recirculation offered more flexibility, supported Turley.

The recirculation system allows operators to send waste activated sludge to the digesters or gravity thickener. They can split the flow to different digesters or, after dewatering with a gravity belt thickener, send it to the storage tanks or return it to different points in the digestion system based on dissolved oxygen in the tank and the solids concentration in the digesters.

Loebe and Sly also backed Turley as he helped to develop bid specifications identifying the materials to use in sewer lines, manholes and lift stations. One unique specification requires contractors to insert PVC pipe into steel sewer pipes that run under railroad tracks and busy roads. "The aged steel pipes are thin and difficult to clean, while the plastic pipe does not corrode or lose carrying capacity," says Turley.

Turley's post-construction inspection program checks sites for damage during the later stages of construction. The village obtains a one-year warranty from developers, and Turley developed an end-of-warranty inspection program.

Meanwhile, Brozovich routinely inspects construction sites through all phases of development. "Bad sewer contractors avoid us because they know of our stringent requirements and inspections," says Turley.

While treating sewage properly is essential to human health and the environment, Turley's years of experience assure the community of award-winning service. **tpo**

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By Doug Day

Anyone would rather receive a check than a bill from the power company every month. That is a real possibility for the Village of Cascade, Wis., about 15 miles west of Lake Michigan.

Coasting down the long hill to downtown, you'd have to know exactly where to look to see two wind turbines that have made the Cascade wastewater treatment plant the first in the state to be 100 percent powered by wind energy.

The 130,000 gpd aerated natural pond treatment plant serves about 700 customers in and around the village. The two 100 kW wind turbines installed this year will save the community \$30,000 a year in electrical costs. That's nearly 10 percent savings in the village's annual budget of \$330,000. With an expected lifespan of 30 years, and with utility power rates expected to escalate, the turbines could save more than \$1 million.

INCENTIVES HELP

Being the first wind-powered treatment plant in the state is a source of pride, according to village trustee Joe Harrison, but it also makes financial sense. "We'll get our money back in twelve-and-a-half years, and that's at current electricity costs," he says.

The village invested \$504,000 toward the total cost of \$904,000. The rest came from Wisconsin Focus on Energy (\$250,000) and the local utility, WE Energies (\$150,000). The village's share of the cost is being funded through the savings, from selling excess power to WE Energies through the utility's net metering program, and from future energy credit revenues.

None of the cost was borne by taxpayers, and there was no sewer fee increase. While residents in some nearby towns pay up to \$200 a month for sewer and water, Harrison pays about \$180 for three months for his 3,300-square-foot home and business.

The turbines, from Northern Power Systems in Vermont, went online in June 2010. Standing 120 feet high, the gearless Northern Power 100 turbines are designed for remote and isolated sites with lower wind speeds. It took just 13 hours for Kettle View Renewable Energy of nearby Random Lake to install the turbines.

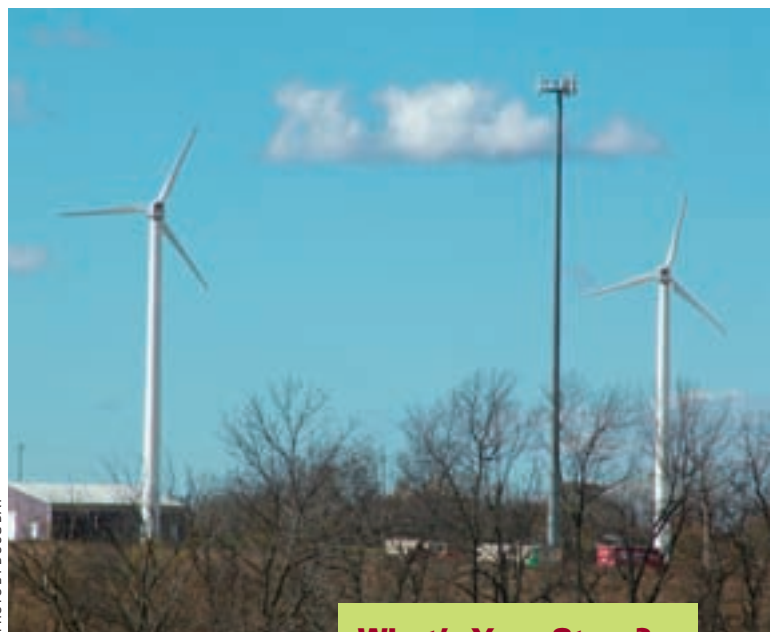


PHOTO BY DOUG DAY

The Northern Power 100 turbines at the Cascade wastewater treatment plant stand only 120 feet high, and flank a cellular tower that generates rental income for the village's park fund.

What's Your Story?

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

The Northern Power website includes real-time monitors of several of its installations, including data on cost savings and emission reductions. It also offers renewable energy educational programs for schools. System owners have access to real-time monitoring and historical reports.

RENEWABLE OPTIONS

Cascade spent two years, with help from Focus on Energy and the village engineering firm, Strategic Municipal Services, looking at ways to power the treatment plant completely with renewable energy. Biogas was the first idea eliminated, simply because the plant doesn't create enough methane.

Harrison says solar was 50 percent more expensive than wind, would take up four of the plant's 95 acres, and would meet only 80 percent of the electrical need. With an average wind speed of 12.4 mph at the plant, the two wind turbines are forecast to generate



PHOTO COURTESY OF THE VILLAGE OF CASCADE WASTEWATER TREATMENT PLANT

A wind turbine at the Cascade facility during construction.




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PHOTO BY DOUG DAY

Net metering and renewable energy credits are expected to create a revenue stream for the village of Cascade for many years to come.

about 110 percent of plant demand, an expected 295,000 kWh per year.

"It just seemed to us that wind power was going to supply the best bang for our buck," says Harrison. "It's a

totally green setup. If there's a breeze, they're producing pennies. With higher winds, they're producing nickels." The turbines will also prevent the emission of nearly 400,000 pounds of carbon every year.

The plant's lagoon and treatment systems were also upgraded in 2010. The \$1.4 million project replaced the three existing lagoons with a 1.2-acre covered lagoon to meet new ammonia standards. With better temperature control to improve bacterial treatment, the wastewater will be returned to the north branch of the Milwaukee River in about three weeks rather than 45 days.

The upgrade went online last October with a new clarifier; high-efficiency pumps, blowers and other equipment; and an Eaton motor control system. The higher efficiency will help increase the amount of electricity sold back to the utility.

In addition, UV disinfection replaced chlorine, cutting chemical costs. That work was funded by a 2.5 percent loan from the state's Clean Water Fund.

The two wind turbines may not be the end of renewable energy for the village. "There is interest in solar power for the village hall and garage," Harrison says. **tpo**

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Working Hand in Hand

AN ILLINOIS VILLAGE MAKES SURE ITS WASTEWATER TREATMENT CAPACITY
KEEPS PACE WITH DEVELOPMENT IN A FAST-GROWING SUBURBAN COMMUNITY

By Jim Force



LIKE A HAND IN A GLOVE, WASTEWATER TREATMENT has matched the rapid growth of housing in Huntley, Ill. Developments like Sun City, Talamore, Heritage, and Covington Lakes have boosted the population of this suburban Chicago village from 5,000 to 23,000 in 10 years.

Rather than become outdated or overwhelmed, the public infrastructure has kept pace through forward-looking planning and partnership between village officials and developers. As part of the planning, Huntley's West Wastewater Treatment Plant, built in 1999 and managed by chief operator Adrian Pino, has grown from a capacity of 650,000 gpd to 2.6 mgd through a series of regular expansions, funded by the development companies.

In return, the plant pumps purified effluent back to the community's developments as irrigation water for a new championship golf course and other common areas. It's a classic case of residential development and infrastructure working together to deal with growth and progress.

Utilities superintendent Steve Zonta says the development proceeded neighborhood by neighborhood. Residential areas were built out in succession and the infrastructure was put in place. "Meetings were held weekly with the public works director, street superintendent and village manager," he recalls. "We worked on all the infrastructure issues at once — sewers, meters, force mains."

"It's been a great marriage," says the public works director Jim Schwartz.

BRAND-NEW PLANT

The West treatment plant was a greenfield project, the first phase consisting of a headworks containing three 1,700 gpm Weir

Specialty Pumps / WEMCO Pump raw sewage pumps and a RAPTOR fine screen (Lakeside Equipment). An Orbal oxidation ditch (Siemens) matched with a pair of 50-foot-diameter Tow-Bro clarifiers (Siemens) provided secondary treatment. Two Siemens traveling bridge sand filters and a vertical UV disinfection system from Ozonia (Degremont Technologies) polished and disinfected the effluent.

Biosolids were aerobically digested in the converted outer ring of the oxidation ditch, a temporary cost-saving solution as further expansions were planned. A Komline-Sanderson Kompress belt filter press with the company's Roto Kone design dewatered the biosolids cake, which was stored on concrete pads and trucked by a private hauler four times a year to farm fields for application.

Pino, who joined the Huntley water and wastewater staff in 1999, explains that Phase 2 of plant improvements occurred in 2002, as capacity increased to 1.6 mgd through the addition of a second Orbal oxidation ditch and another clarifier. In 2008, Phase 3 expanded the plant to its present capacity. "We added quite a bit of new equipment, including another oxidation ditch (for a total of three), two new 85-foot clarifiers, and a single 50-foot clarifier (for a total of six), and an additional traveling bridge filter," says Pino.

Three Pulsafeeder pumps and a 6,500-gallon alum storage tank supply aluminum sulfate to remove phosphorus. The UV system was replaced with a new system of the same design from Ozonia. "The system consists of two channels, with two modules each, and a total of 160 bulbs," says Pino. "It's really easy to clean the bulbs and it only takes one person to do it." The system is also flow-paced, providing only as much UV light as needed.

The Huntley West Wastewater Treatment Plant.
(Photography by Eddie Quinones)

profile

West Wastewater Treatment Plant, Huntley, Ill.



BUILT:	1999; upgraded 2002 and 2008
POPULATION SERVED:	18,000
FLOW:	2.6 mgd design
TREATMENT LEVEL:	Tertiary
TREATMENT PROCESS:	Oxidation ditch, gravity sand filtration
RECEIVING WATER:	100 percent reuse spring through fall; discharge to Kishwaukee River in winter
BIOSOLIDS:	Aerobic digestion; filter press dewatering; land application
STAFF:	Steve Zonta, utilities superintendent; Adrian Pino, chief wastewater operator; Tim Kerley, Dave Foss, Jason Stumbaugh, operators. East plant operators Brian Baumann, Nick Theis.
ANNUAL BUDGET:	\$1.85 million (West and East plant operations)
GPS COORDINATES:	Latitude: 42°10'2.71"N; longitude: 8°25'3.27"W
WEBSITE:	www.huntley.il.us

Dave Foss, operator, checks the Ashbrook gravity belt thickener.



Village of Huntley West Wastewater Treatment Plant PERMIT AND PERFORMANCE			
	INFLUENT	EFFLUENT	PERMIT
BOD	250 mg/l	2.8 mg/l	10 mg/l
TSS	278 mg/l	2.8 mg/l	12 mg/l
Phosphorus	5.5 mg/l	0.44 mg/l	1.0 mg/l

The biosolids side also saw improvements in Phase 3. The material goes through a pair of Ashbrook gravity belt thickeners and then it is stabilized in a new four-celled aerobic digester supplied with air from two 150 hp Kaeser blowers. Two Moyno progressive cavity pumps move the digested solids to the existing filter press. A new 80- by 100-foot storage pad more than doubled biosolids cake storage.

The upgraded plant contains new power and control systems. A 1,250 kW Cummins diesel generator supplies emergency power for the entire plant. SCADA software (Invensys Operations Management — Wonderware) and Allen-Bradley (Rockwell Automation) PLCs were integrated by Baxter & Woodman Control Systems Integration (BWCSI), of nearby Ridgefield, Ill. The system controls water and wastewater treatment as well as sanitary lift stations. All information is communicated to the control panel at the West plant.

Pino says the control system is “an outstanding addition. We can monitor the process and make changes in operational values from virtually any place there is a computer with Internet. It’s saving us a lot of time and money.”

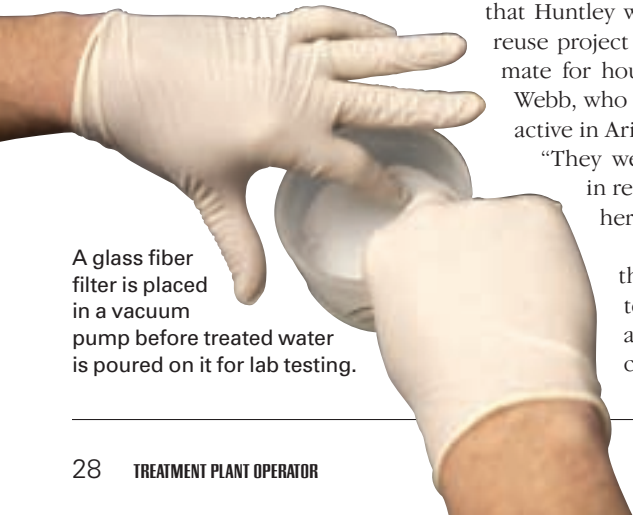
RECYCLE, REUSE

The West plant’s permit calls for recycling 34 percent of its effluent as irrigation water for the community from April through October. The plant is actually recycling and reusing 100 percent of the effluent during those months. “We use a flow baffle to divert all of our effluent for recycle and reuse from spring through fall, and discharge treated water to the Kishwaukee River during the winter,” Pino says.

Two WEMCO pumps move the recycled water to the recycle pond through a 7,000-foot pipeline. Pino explains that Huntley was the first recycle-reuse project in a four-season climate for housing developer Del Webb, who had previously been active in Arizona and California.

“They were really interested in reuse when they came here,” he says.

Zonta notes that the recycle-reuse system takes considerable strain off the community’s potable



A glass fiber filter is placed in a vacuum pump before treated water is poured on it for lab testing.

INTEGRATING TREATMENT

In many communities, wastewater treatment is dealt with as an afterthought or hidden necessity. Not so in Huntley, Ill. Wastewater infrastructure was an essential part of the development planning, right from the start.

The original Village of Huntley, population about 5,000, is served by the East Wastewater Treatment Plant, built to capacity at just under 2 mgd. For the new development, which ultimately would add 15,000 to 20,000 new residents, the master plan laid out 130 miles of new sewers in neighborhood grids to the west and north of the village center. And space was set aside for the new West treatment plant.

“We applied for a phased permit,” says public works director Jim Schwartz. “That meant we didn’t have to keep going back to the state and start all over again each time we expanded.” The phased permit also helped in negotiations with local environmental groups, since that discussion and agreement took place just once.

Coordination with the developers was also essential. The locations and number of lift stations was an example. “When we started out, we wanted to limit manholes to a depth of 20 feet, but that meant we’d need five lift stations,” Schwartz says. “We negotiated, and by going to 30 feet, we reduced the number of lift stations to just two.”

Not only was wastewater treatment part of the community’s development plan, it actually helped recruit new homeowners. The treatment plant and the sewer system helped convince potential buyers that Huntley was the right community for them. “We invited prospective residents to the plant and showed them how our infrastructure was ready to serve their water and wastewater needs,” Pino says.

source — a deepwater aquifer. “This year, we supplied 243 million gallons of water,” he says. “That is about 25 to 30 percent of the total potable water used by the village in a typical year, so the savings in cost and source water usage is significant.”

Plans are in place to start supplying recycled water to another development, and the reuse piping is already in place.

WORK-AROUNDS

Expanding and upgrading treatment while continuing to treat flow and meet permit is always a challenge. Like other treatment plant staffs, the Huntley team has learned some lessons from these on-the-fly situations.

“It really helped that we had a phased long-term plan and permit in place,” says Schwartz. “And it was also helpful that we used one contractor (J.J. Henderson of Gurnee, Ill.) throughout the initial construction and the expansions.”

Pino says extra tank capacity came in handy as new lines and processes were tied into the system. “We were able to divert flow or stop flow as necessary,” he says. However, no matter how well one prepares, there are bound to be incidents.

“Something always gets hit during excavation when existing pipe and conduit are in place,” says Pino. “It’s inevitable.” He says good communication is the key. He acted as the single point of contact between the plant staff and the contractor: all communications about requests, issues and projects channeled through him.

The expansion presented opportunities to improve treatment, as well. “We used the project as a chance to start the biomass over again from scratch,”

(continued)

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Jason Stumbaugh, maintenance worker, reads the meter on the Pulsafeeder chemical feed pump.

Pino says. "Due to long conveyance time in our sewers, we were getting significant filamentous growth. We pressed and dewatered all our old solids, then started new by filling a tank with effluent, mixed liquor and raw wastewater. With new biomass, we saw improved settling and ammonia numbers, and we solved the filamentous issues."

The new developments in Huntley are nearly completed. Original plans called for more than 11,000 new homes and a population of about 25,000. Today, the last of the developments is awaiting the end of the recession before construction is complete, and the village population is nearly 24,000.

"Fifteen years ago, this was the wild west out here," says Schwartz. Now, Huntley is one of the more substantial communities in the northwest suburban areas of Chicago. In addition, while the current growth spurt is just about over, village officials are already prepared for future needs. Phase 4 of the West treatment plant expansion is already on the books and would take the capacity to 4.8 mgd with a maximum build-out to nearly 8 mgd. **tpo**



Adrian Pino, chief operator of the Huntley Wastewater Treatment Plant.

"The control system is an outstanding addition. We can monitor the process and make changes in operational values from virtually any place there is a computer with Internet. It's saving us a lot of time and money."

ADRIAN PINO

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AN IFAS PROCESS HELPS A COLORADO SANITATION DISTRICT MEET THE CHALLENGE OF A TOUGHER PERMIT LIMIT ON EFFLUENT AMMONIA

By Scottie Dayton

In April 2005, the Fairplay (Colo.) Sanitation District's permit limit for effluent ammonia dropped from 25 mg/l to 10 mg/l. The three-cell, 7.4-million-gallon surface aeration lagoon could not meet that limit, as half the year the water was frozen or so cold that nitrifying bacteria perished.

In September 2006, the state EPA issued a cease-and-desist order. It also fined the district \$112,000 because effluent discharged to the Middle Fork of the South Platte River, a high-quality trout stream, exceeded ammonia limits.

The district board decided to build a new plant and charged David Stanford, contract wastewater operator, and an attorney to write a request for proposals for a design-build team.

"The RFP was very specific and tough," says Stanford. "The plant had to meet present and future ammonia standards, be expandable, address future nutrient issues, and fit in a small footprint. The design had to have a two-year process warranty, and be operated and maintained by one man."

The board chose the team of Burns & McDonnell Engineering Co. in Centennial and Moltz Construction from Salida. Andrew Waddoups, P.E., project manager from the engineering firm, met the challenge by specifying the AnoxKaldnes Hybas system from Kruger USA in Cary, N.C.

"Adding media to the aeration basins makes it possible to maintain nitrifying biomass in a much smaller footprint than with conventional activated sludge systems. We increased our nitrification capacity without increasing the solids loading rate to the clarifiers."

DAVID STANFORD

COLD AND CLEAR

"We selected integrated fixed-film activated sludge (IFAS) reactors because they can remove ammonia at cold temperatures," says Waddoups. "A primary goal was to treat the wastewater quickly, before it had time to cool off further."

The 72- by 73-foot plant received influent in late November 2008. By Jan. 1, 2009, ammonia levels were less than 1 mg/l. By summer 2010, BOD was 2 mg/l, TSS 5 mg/l, *E. coli* well in compliance, and ammonia averaged 0.10 mg/l.



PHOTOS COURTESY OF H2O CONSULTANTS LTD.

During construction, the contractor's biggest challenge was finding small enough forms to pour the concrete treatment basins and two 100,000-gallon rectangular clarifiers, one on either side of the basins, as one unit.

Share Your Idea

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

That fall, the Fairplay Wastewater Treatment Facility received an award from the American Council of Engineering Companies in the water and wastewater category, and a 2010 Design-Build Award from the Design-Build Institute of America.

Winter temperatures in Fairplay, elevation 9,800 feet, reach 20 degrees below zero, sending frost 11 feet deep. Influent entered the 400,000 gpd lagoon system at 40 to 42 degrees and discharged at 32.5 degrees. The first cell held 3.5 million gallons, the second 1.5 million gallons, and the third, a polishing pond, held 800,000 gallons.

The original system, built in the 1970s, was designed around residents leaving their taps open in winter to prevent the shallow water mains from freezing. When the town installed new mains eight feet deep, the winter access flow was eliminated, allowing Waddoups to downsize the facility to 300,000 gpd based on a 20-year population projection of 1,200.

CHALLENGING INSTALL

Project manager Cole Phillips and crew from Moltz Construction backfilled the three cells. Their biggest challenge was finding small enough forms to pour the concrete treatment basins and two 100,000-gallon rectangular clarifiers, one on either side of the basins, as one unit. The clarifiers would be outside the building and covered.

When the work was completed, wastewater entered the headworks through a 3-mm spiral bar screen and grit removal unit, then flowed into the anoxic reactor. The dual trains of the aeration system each have two aerobic reactors containing AnoxKaldnes K1 media, secondary clarification, and UV disinfection.

"Moltz rebuilt the polishing pond as a 400,000-gallon aerobic digester for waste activated sludge," says Stanford. "Our volume was so limited that it wasn't financially viable to install a belt press." Moltz lined the pond and installed floating aerators.

The 15-foot-square reactors are 16 feet deep with media levels in the first and second at 65 and 38 percent full. The design mixed liquor suspended solids is 3,000 mg/l. The biological system treats screened influent down to

LEFT: A worker adds media to an aeration basin. The media made it possible to maintain nitrifying biomass in a much smaller footprint than with conventional activated sludge systems. BELOW: Plant operator David Stanford samples for ammonia.



The covered clarifier basins behind the treatment plant.

10 mg/l BOD and 1.0 mg/l effluent NH-N. The return activated sludge (RAS) rate has a maximum of 150 percent of influent flow, and the internal recycle design rate is 70 percent.

HOW IT WORKS

The process uses stainless steel retention screens to keep 6,427 cubic feet of non-clogging high-density polyethylene media inside the basins. The media does not require backwashing and has a low headloss. Mixed liquor passing through the screens settles in the secondary clarifiers.

"Adding media to the aeration basins made it possible to maintain nitrifying biomass in a much smaller footprint than with conventional activated sludge systems," says Stanford. "We increased our nitrification capacity without increasing the solids loading rate to the clarifiers."

The pre-denitrification zone combines nitrified internal recirculation, raw influent, and RAS to achieve total nitrogen removal and partial BOD reduction. "Our flows average 100,000 gpd, so we don't detain the water for very long to retain its residual heat," says Stanford. "During cold weather, we increase the sludge to achieve the desired ammonia removal. Right now, the flows are so low that I'm using only one clarifier, and keeping the balance of food-to-microorganisms ratio to a three-day sludge life."

The alkalinity reaching the plant was a concern, as it averaged just 120 to 150 mg/l. In 2007, the district hired Insituform to line 50,000 feet of clay tile sewers to solve inflow/infiltration problems. "It made a dramatic difference," says Stanford. "Alkalinity numbers jumped to 350 mg/l, which meant we didn't have to add any to the process."

The project was budgeted at \$5 million and came in at \$4.7 million. **tpo**

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An Air of Efficiency

A MISSOURI PLANT KNOCKS DOWN ENERGY CONSUMPTION AND COSTS WITH AERATION IMPROVEMENTS INCLUDING VARIABLE-FREQUENCY DRIVES AND SCADA CONTROL

By Daniel A. Gummersheimer and John Harris

In March 2010, the municipal wastewater treatment plant in Bowling Green, Mo., worked with Alliance Water Resources and equipment vendors to improve the aeration process and drive down energy consumption.

The improvements included replacing coarse-bubble diffusers with fine-bubble diffusers and the addition of variable-frequency drives connected to the existing blower assemblies that provide air supply to the two aerations basins.

After the improvements, the treatment plant (850,000 gpd design flow, 500,000 gpd average) realized a reduction in electric power consumption averaging 40 percent or greater. The municipality benefits through lower monthly electricity bills and reduced quantities of waste activated sludge and biosolids.

The city saved additional money because the local electricity provider later implemented a 10 percent electric rate increase, and because the aeration process improvements reduced power demand and therefore demand charges.

Reducing operating costs through an equipment retrofit is a clear illustration of a municipality working to save customers money and is especially valuable during an economic downturn.

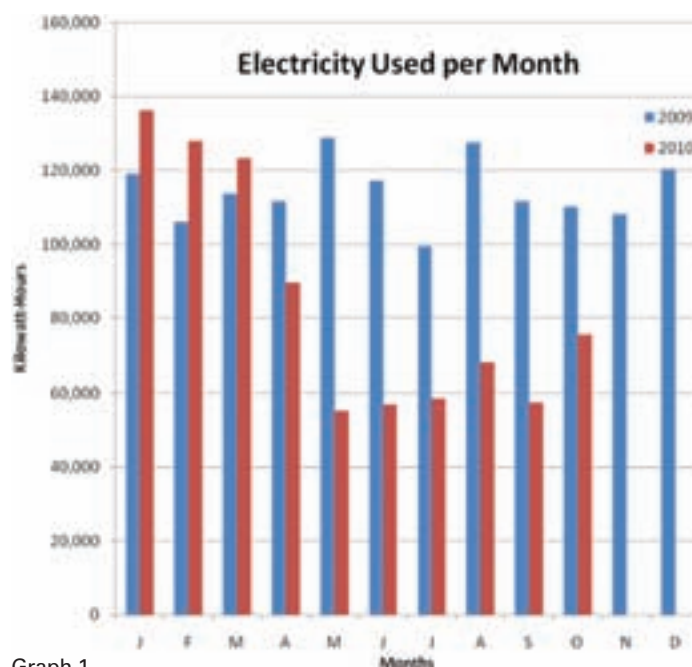
bubble diffusers in the two aeration basins and two digester basins with fine-bubble diffusers, and reprogramming the SCADA controls that integrate equipment operations with the attributes of the influent wastewater.

Alliance Water agreed to fund the estimated \$120,000 in capital improvements through an enhanced operations contract. Two Altivar 61VFD units (Schneider Electric) now control the rotational speed of the electric motors connected to the three Sutorbilt positive displacement blowers (Gardner Denver), each rated at 75 hp and

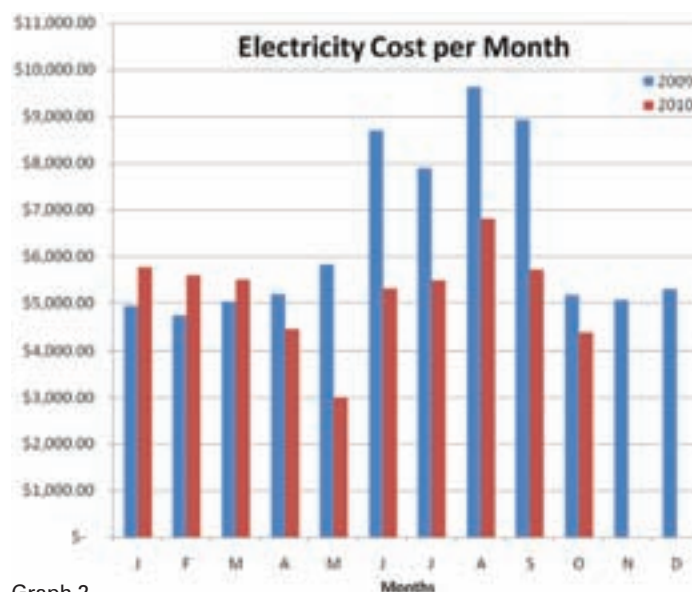
A one-time incentive of \$55,220 from the local electricity provider, Ameren UE, helped offset the capital cost of the improvements, reducing the actual project cost from \$120,227 to \$65,007, a 46 percent savings.

PRODUCTIVE PARTNERSHIP

Alliance Water partnered with Environmental Dynamics Inc. (EDI) and Vandevanter Engineering to explore the feasibility and estimate the benefits of installing variable-frequency drives (VFDs), replacing the coarse-



Graph 1



Graph 2

each providing 900 icfm airflow to the aeration basins.

EDI supplied 96 FlexAir Mini Panel fine-bubble diffusers in each aeration basin, reducing the air volume required and providing airflow over a larger surface area of the basin. Lower air requirements reduced the air-supply demands required from each blower, in turn reducing electric demand from 75 hp per basin to 20 hp per basin.

The control logic ties the blowers to dissolved oxygen probes in the aeration basins. When a basin DO level reaches 2.0 mg/l or less, a SCADA signal calls for the blower to power up. The VFD controls the rotational speed and therefore the air volume delivered to the basin.

For each of the two digesters, EDI supplied and installed 64 FlexAir 63P Magnum fine-bubble diffusers.

		BOD	TSS	NH3	Oil & Grease	pH
		30	30	2.1 summer; 3.0 winter	10	>6.0
Before Aeration Improvements	Apr-09	4.5	5.2	0.49	2.6	6.7
	May-09	3.5	2.7	0.55	1.5	7
	Jun-09	3.4	2.9	0.2	1.3	7
	2nd Qtr. Ave.	3.8	3.6	0.41	1.8	6.9
	Jul-09	3.3	3.2	0.35	0.9	7.2
	Aug-09	3.1	3.4	0.42	3.9	7.3
	Sep-09	2.7	4.4	10.58	5.8	7.3
	3rd Qtr. Ave.	3.0	3.7	3.78	3.5	7.3
	Oct-09	3.2	7.0	16.46	1.0	7.2
	Nov-09	3.8	6.0	0.02	0.6	6.7
	Dec-09	4.7	7.7	0.02	0.5	6.9
	4th Qtr. Ave.	3.9	6.9	5.5	0.7	6.9
	Jan-10	4.2	12.2	0.02	1.1	6.5
	Feb-10	6.1	7.0	<0.015	1.4	6.5
	Mar-10	6.5	7.6	<0.015	0.9	6.7
	1st Qtr. Ave.	5.6	8.9	0.02	1.1	6.6
After Aeration Improvements	Apr-10	2.9	3.9	<0.015	1.0	6.7
	May-10	2.9	3.7	0.126	0.6	6.6
	Jun-10	3.8	5.6	0.08	0.7	6.8
	2nd Qtr. Ave.	3.2	4.4	0.10	0.8	6.7
	Jul-10	3.8	5.2	0.33	1.1	6.8
	Aug-10	2.3	2.4	0.39	1.0	6.9
	Sep-10	5.1	7.4	<0.015	1.4	6.9
	3rd Qtr. Ave.	3.7	5.0	0.36	1.2	6.9

Note: Ammonia as N
Summer (May 1- Oct 31) = 2.1 ppm
Winter (Nov 1- Apr 30) = 3.0 ppm

Table 1

SUSTAINED COMPLIANCE

The treatment plant staff took the aeration basins down one at a time for the retrofits, each of which took three days. The first day consisted of emptying the basin and removing the old equipment. On the second day workers installed the new equipment. The third day's work consisted of pressure testing and commissioning.

The aeration process improvements reduced monthly electricity consumption by an average of 44 percent per month (Graph 1). Before the improvements, from January 2009 through March 2010, average monthly usage was 117,480 kWh. After the improvements, from April 2010 on, the average monthly usage was 65,897 kWh.

The average electric bill (Graph 2) was \$6,215 before the improvements and \$5,024 after. Therefore, the average monthly reduction in electricity cost was about \$1,200, or 19 percent. At the current pace, annual savings of at least \$15,000 can be expected, even after the 10 percent electric rate increase.

The aeration process improvements did not adversely affect effluent quality (Table 1). Key parameters remained well below permit limits.

Additional electricity cost savings came from disconnecting two motive pumps as part of the aeration basin work. These pumps (40 hp) used to run continuously but were no longer needed after installation of the new diffusers and equipment.

The plant staff also has observed a reduction in wasting of sludge from the aeration basins from 30,000 gpd to 10,000 gpd, attributed to improved air distribution across the basins, leading to higher microbial activity and increased consumption of organic matter. Less wasting is expected to bring a significant reduction in the volume of biosolids, which are land-applied at about 3 percent solids.

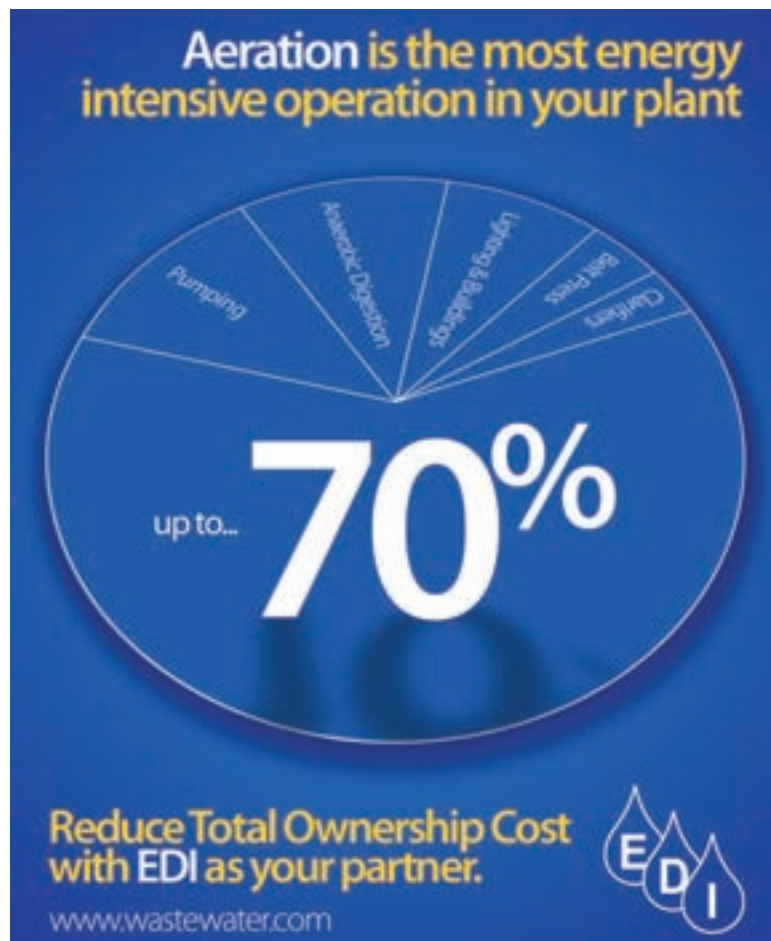
The staff also expects to see less buildup of heavy sludge in the

aeration basin bottoms when the basins are taken down for regular maintenance.

The electricity and other savings will continue to reward Bowling Green with dividends long after the estimated three-year payback on the initial investment. Reducing operating costs through an equipment retrofit is a clear illustration of a municipality working to save customers money and is especially valuable during an economic downturn.

ABOUT THE AUTHORS

Daniel A. Gummertsheimer, P.E., is a division manager with Alliance Water Resources, a provider of contract management and operations services based in Columbia, Mo., and serving Missouri and surrounding states. He can be reached at dgummertsheimer@alliancewater.com. John Harris is plant operator for Alliance Water at the Bowling Green treatment plant. tpo



Beyond the Walls

A MINIMUM-SECURITY PRISON'S TREATMENT PLANT SENDS CLEAN WATER TO THE ENVIRONMENT AND BETTER PEOPLE BACK INTO SOCIETY

By Doug Day

As certified operators at a wastewater treatment plant in Littlerock, Wash., Derek Williams and Anthony Nitsch are looking for new opportunities anywhere in the country. Their boss, Ed Burns, would be happy to see them leave his plant at the Cedar Creek Corrections Center and move into careers in the wastewater industry.

Williams and Nitsch are inmates at the Cedar Creek minimum-security prison southwest of Olympia. While incarcerated, both have earned their Group 2 Wastewater and Group I Water Distribution certificates.

Another inmate, Dustin Harris, just started the prison's 4,000-hour operator's course. Their hopes are to have a career in the field, just like the last inmate to leave the prison's program. He is now running the treatment plant of a large Washington ski resort at a salary of \$25 per hour, along with a house to live in and free lift tickets.

While learning, the inmates operate the prison's 46,000 gpd activated sludge tertiary treatment plant under the leadership of plant manager Demar Holtz and two prison staff members, backup operator Steve Blahut, and Burns, the senior operator and trainer.

Built in 1991, the plant consists of a headworks, aeration basin, secondary clarifier, sand filter, cooling tower, two UV disinfection channels, and a digester. The plant staff talked about the treatment plant and the training program in an interview with *Treatment Plant Operator*.

tpo: Why offer a training course for wastewater operators?

Holtz: It's part of our re-entry initiative to get these guys back into the community. Once they finish the program, inmates continue working at the plant until they qualify for work release or finish their sentence.

tpo: How is the plant staffed?

Holtz: We have two staff operators and three inmates. One staff operator is on call after normal hours. The inmates are the first responders during plant upsets.

tpo: What kind of treatment performance have you seen?

Holtz: We have no redundancy, but our operators have been able to operate it extremely well. We received the state Department of Ecology's 100 Percent Wastewater Award in 1995, 1996, 2007, 2008 and 2009.

tpo: You also received acknowledgement for an emergency repair last summer?

Holtz: The operators did a critical and outstanding job alongside



PHOTOS COURTESY OF CEDAR CREEK CORRECTIONS CENTER



TOP LEFT: Inmate operator Anthony Nitsch cleans the UV disinfection system at the Cedar Creek Corrections Center. Nitsch recently became eligible for the prison's work release program and has applied at two area wastewater plants. TOP RIGHT: Inmate operator Derek Williams conducts a BOD test. Williams will soon become eligible for work release and hopes to find work in the wastewater field. LOWER: Dustin Harris, the newest member of the wastewater operators' class, collects a mixed liquor sample.

the contractors when we had to replace the aeration basin liner. We brought in a large tank to act as a waste holding tank and installed fine-bubble diffusers so the digester could be used as a temporary aeration basin. We bypassed the headworks and influent line to install two valves and an 8-inch line from the headworks to the digester and from the digester to the clarifier to isolate the aeration basin.

We then removed the single 30 mil liner and the underdrain system and installed two 60 mil liners with a mesh layer and leak detection, and a new underdrain system. The aeration basin replacement took 36 days and the entire project took three months. We met our permit requirements the entire time.

Nitsch: We also drained, cleaned, and inspected the clarifier while refilling the new aeration basin. And we replaced the variable-frequency drives, giving us control of RAS/WAS flow rates from the lab, which is better than trying to maintain flow manually from a valve at the pumps.

Williams: Earlier this year, we replaced our UV disinfection system with a slightly larger one, while keeping the same footprint. The new one gives a digital readout of the UV intensity, and an alarm to indicate when it drops below its set point.

tpo: Cedar Creek offers many vocational programs. Why did you, as inmates, pick wastewater?

Williams: I knew someone who had done this and saw the chance he had to make a change in his life and the type of money he

can make. It was an opportunity to do something different with my life and become successful at something. I gain a sense of gratification in helping protect the world's water and environment.

Nitsch: I've been locked up for more than 13 years, so I was looking for something to help me get back into the community. I just got my Operator 2 license and became eligible for work release, so I've applied at two plants.

Harris: It's an industry that's going to be here for a long time, and I wanted to have a career that would support my family in the long term.

tpo: With 480 inmates and only three positions available in the treatment plant, how are people selected?

Williams: There is an interview process when they need someone. If selected, you're on a trial basis for the first month. If you do well, you start the Sacramento State University correspondence course to help you get a Group 1 certification. Since we also work with the water system, we have the opportunity to take the Waterworks Operator Certification exam.

tpo: What does the training program include?

Nitsch: The program offers three courses. It is recommended that we also take the Operation and Maintenance of Collection Systems course to give us a better understanding of the affect a collection system has on a treatment plant. We can, at our own expense, continue courses to help us take the Group II test. There are a lot of other study material and books available to us.

Williams: They give us hands-on experience in learning the

year carpentry program, but I never really knew what I wanted to do.

I was looking for something to better my future. It's a wide open field with a lot of room for growth. I have three years left on my sentence, so I have plenty of time to obtain my Operator 2 certificate. I'd like to go all the way to an Operator 4. I'm excited about my future.

tpo: Why should a treatment plant hire people from this training program?

Burns: These inmates have worked hard to learn this trade and are treated as regular employees, expected to show up ready for work and to learn every day, weekends included, as if this were a regular job. They are not going to easily forfeit this hard work once released. I am confident they will work as hard for you as they have for me. These guys are not just worker bees; they know what they are doing.

Holtz: The program not only benefits the offenders, it's a great benefit to the staff, the facility and our taxpayers. These guys perform a major responsibility at pennies on the dollar. There is a recognizable difference in them.

Blahut: Our inmates learn every process. I see them as they begin to appreciate our ecology and environment. Then they start seeing how it correlates with their social environment and start making personal changes.

Harris: Wastewater pays a lot less than most jobs around here, plus we have to study and take the courses. The people coming out of the program have a passion for this.

Williams: We're not just felons. We're people who are coming back into society. We've learned some good things and have a lot to

"I've been locked up for more than 13 years, so I was looking for something to help me get back into the community. I just got my Operator 2 license and became eligible for work release, so I've applied at two plants."

ANTHONY NITSCH

entire process and teach us how to make decisions. We do everything from walk-throughs to laboratory tests such as TSS, VSS, settleometer, DO uptake, pH, BOD, fecal coliform, chlorine residual, and microorganism examination.

They teach us to interpret that data and apply it to process control. Ed Burns makes sure we understand the operation and maintenance of all the equipment, and we have the responsibility of maintaining it. The plant is susceptible to seasonal flow increases and upsets. We're taught to recognize, understand, and deal with problems.

Harris: We receive a combination of schooling and on-the-job training. Being able to apply what we are taught helps us absorb the knowledge and understand the process.

tpo: Beyond running a wastewater plant, what have you learned?

Nitsch: How to approach studying and learning, and about taking responsibility. I've spent a lot of time preparing for release. Before I joined this program, I concentrated on trying to survive.

Before being locked up, I wasn't concerned about much and wasn't responsible for anything. I feel good about my chances of getting a job in wastewater, being responsible for myself and others around me, and being a productive member of society.

Williams: I didn't have a lot of hope for my future. I've learned a lot about myself. It's given me confidence in my ability to have a career, learn new skills, overcome my past, and become a positive member of society. I take pride in doing this.

Harris: Being new, I'm learning so much so quickly it's hard to pinpoint. Definitely responsibility and working with others. Before going to prison, I graduated from community college and took a one-

offer. The past is the past and we're trying to do something about our future.

Wastewater treatment plants can contact Holtz at 360/359-4141 for more information about the offender training program, work release opportunities, or hiring certified operators when they get out of prison. tpo

"In my experience as a state regulator of more than 100 wastewater treatment plants, I'm generally impressed with the operators trained by the Department of Corrections. Operators from this training program have become operators in responsible charge, lead operator, contract operator, and operators working for large corporations."

Pat Bailey
Environmental Specialist
Washington State Department of Ecology

"These operators are highly trained, responsible, valued employees. They have taken what could have been the worst situation in life and turned it into an opportunity to change their life. Given a chance, these men are career operators. I have a great respect for them in turning their lives around."

Carl Jones
Outreach Operator
Washington State Department of Ecology

Magmeters resolve wastewater overflow

Problem

During high-water events, the main wastewater treatment plant of the Greater Pottsville (Pa.) Area Sewer Authority flooded, causing combined sewer overflows to the Schuylkill River and fines from the state Department of Environmental Protection. To find a solution, the city hired the Bucharth-Horn engineering and architectural firm in York. Senior engineer Bruce Hulshizer brought in Krohne Inc. to decide how to divide the sanitary and stormwater flows.

Solution

Krohne recommended 21 Tidalflux electromagnetic flowmeters. By partially filling them, the authority could measure normal flows, which would not fill the magmeters. Once the plant personnel knew the normal flows, they knew how much stormwater to divert during heavy rains.

The capacitive flow-level measuring system, built into the wall of the measuring tube, provides accurate flow measurements in the partially filled pipes, with levels between 10 and 100 percent of the pipe cross-section. The units were wet-calibrated by direct comparison of volumes for an accuracy of plus or minus 0.2 percent of actual value. "The flowmeters give a steady display of measured values regardless of rough product surfaces and distorted flow profiles," says Hulshizer.

RESULT

The load on the plant was substantially reduced in high-water events, allowing it to meet the DEP consent order and protect the environment. 800/356-9464; www.krohne.com.



Air/gas mass flowmeter improves treatment efficiency

Problem

Plant engineers for a wastewater treatment facility near Phoenix, Ariz., needed to place airflow meters underground in a rugged area requiring remote access. The site was further challenged with straight pipe run limitations, the presence of hazardous gases, and a wet and dirty environment.

The meters had to be installed in a 24-inch line for blower airflow to the aeration basins. Accurate airflow measurement was necessary for the control system to maintain correct levels of dissolved oxygen in aeration basins and proper wastewater treatment. The meters needed to be accurate over a wide wastewater flow range based on flow rates projected to increase from 0.5 to 3.0 mgd.

Solution

The engineers selected the **ST98 flowmeter from Fluid Components International (FCI)** because of its accurate performance over a wide flow range, ease of installation, reliable performance, and low maintenance. The meter's thermal dispersion mass flow sensing element promised the necessary performance in the harsh environment. To compensate for flow disturbances from the limited straight pipe runs, the Vortab Insertion Panel Flow Conditioner (Model VIP) was installed to ensure accuracy.

RESULT

Optimizing the aeration process by measuring and controlling the aeration system's airflow with an accurate, reliable flowmeter significantly improved plant efficiency. The control of airflow to the aeration tanks enabled useful bacteria growth to increase together with the removal capacity for suspended organic materials.

The treatment process is now better controlled to meet peak demand processing requirements such as wet weather. The remaining water can leave the aeration secondary treatment process at least 85 percent cleaner than when it arrived. 760/744-6950; www.fluidcomponents.com.



Reinforcing risk management

Problem

The Trenton (Mich.) Wastewater Treatment Plant processes 4 mgd with a design flow of 6.5 mgd. Even with the extra capacity, heavy rains occasionally cause overflows into the Detroit River. In 2002, Trenton upgraded its plant and lift stations with process protection and redundancies hardware and software from Rockwell Automation. Five years later, with the city facing budget shortfalls, Rockwell offered a way to minimize maintenance costs while adding a services and support contract.

Solution

The main process control system upgrade featured **components from Allen-Bradley**. Besides ControlLogix programmable automation controllers, the FactoryTalk AssetCentre change management software ensured compliance with state disaster recovery requirements.

The plant's power distribution system used IntelliCENTER motor control center software with Powermonitor meters. Operators monitor the SCADA



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TIPS AND TRICKS

The author, Robert Stull (right) is shown with operator Randy Fulcher at the head of the Elliston facility, where alum used to be fed into the process before the splitter box system was devised.



P Removal: A Better Way

Submitted by: Robert M. Stull, Class I operator and wastewater manager at the Elliston (Va.) Wastewater Treatment Plant.
Contact: stullrm@montgomerycountyva.gov

We have an oxidation ditch system. Since the plant was started up in 1987, we have been feeding alum for phosphorus removal at the head of the plant. We have four channels: The two outer ones are used to treat the waste, and the two inner channels are used as digesters. Normally, we use the outermost channel (Number 1) for treatment and Number 2 for heavy flows and backup. We decided to drain and clean the Number 1 channel and switched to Number 2 for treatment.

When we drained the Number 1 channel, we found a large amount of solids that had settled below our aeration disks right where the alum was feeding to the plant. I asked Donna Lawson, wastewater technician II with the Virginia Rural Water Association, to stop by, look at the situation, and give us feedback and suggestions. She immediately questioned why we were feeding alum at the head of the plant right where our raw wastewater came in. The only reply I could give was, "It has been done that way for 20-plus years."

We agreed that alum should be fed at the splitter box just before the clarifiers. The piping was already in place, and turning two valves was all it took to make the change.

Our permit limit on phosphorus is 2.0 mg/l monthly average. When feeding alum at the head of the plant, our phosphorus tests were averaging 1.0 to 1.3 mg/l, well below our limit. We were feeding about 190 to 200 gallons per week.

After switching to the splitter box feed, we cut our alum usage in half to 95 gallons per week, and our phosphorus is running 0.3 to 0.4 mg/l per test. This is saving us about \$1,800 every eight months.

As operators we do some things because, "That's the way it has always been done." I know we have to be careful and always keep our permit limits in mind, but we can take calculated small steps that can improve our plant operations. **tpo**

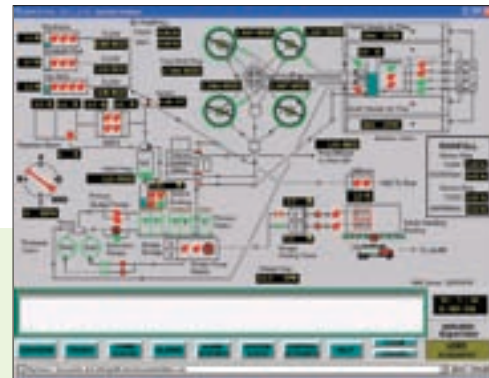
We welcome reader contributions to this column. Please send them to editor@tpomag.com

system by redundant servers running FactoryTalk View SE human-machine interface software. It uses wireless EtherNet/IP to monitor four remote pumping stations running on PowerFlex drives. The standardized system enables Pat Raftery, plant superintendent, to run the facility with 11 operators and one electrical technician.

The services contract includes monthly visits from a Rockwell technician, staff training, access to specific area specialists, software upgrades, a fixed rate for emergency service, and unlimited, real-time Automation TechConnect support.

RESULT

When the facility's main server failed, operators faced the risk of an overflow or process failure. A Rockwell technician quickly transferred plant operation to the redundant system, bringing remote monitoring and control functions back online within five hours. "The meltdown made us immediately aware of how dependant we'd become on our monitoring, diagnostic, and control capabilities," says Raftery. "With the service contract, we don't have to worry about operation failures from technical issues." **519/244-3681; www.rockwellautomation.com. tpo**



Monitoring and Instrumentation

By Benjamin Wideman

ELECTROMAGNETIC FLOWMETERS

FMG600 Series electromagnetic flowmeters from Omega Engineering measure conductive liquids. The meters have no moving parts and a PTFE lining. Standard outputs include analog, frequency and RS485 communications. Optional sanitary tri-clamp mounting allows use of the FMG600 flowmeters in applications not previously open to magmeters. Local- and remote-display models are available. **203/359-1660; www.omega.com.**



FMG600 Series flowmeters from Omega Engineering



NanoCourier Transmitter from Automata

VERSATILE TRANSMITTER

The NanoCourier Transmitter from Automata is a tool for applications such as sending flow or water-quality data back to the user. It is available with spread spectrum or satellite telemetry. The data can be transmitted to a home or office computer or be made available via the Internet. Extremely low standby current makes the device suitable for solar sites. In applications reporting infrequently it can be used with no charger. It includes a set of configurable parameters that add versatility to many applications. It can be networked with the company's Mini Field

Station. **800/994-0380; www.automata-inc.com.**

FULL-FEATURED METER

The Model ST51 mass flowmeter from Fluid Components International is a full-featured meter with high-accuracy electronics in a compact, explosion-proof transmitter that is easy to install and requires minimal maintenance. The device measures digester gas, biogas and other methane composition biofuel gases. It is calibrated to match the gas composition of the user's digester system under site-specific flow conditions.

The device uses a thermal mass flow element with flow accuracy to ± 1 percent of reading over a broad flow range from 0.3 to 400 SFPS and repeatability of ± 0.5 percent. A robust thermal mass flow-sensing element has no moving parts and no orifices. It includes built-in temperature compensation circuitry. The flow element is constructed with a 316L stainless steel body and Hastelloy C-22 thermowell sensors to resist corrosion in digester gas pipelines. **800/854-1993; www.fluidcomponents.com.**



Model ST51 flowmeter from Fluid Components International

OUTDOOR-RATED MODULES AND MODEMS

Zlinx Xtreme outdoor-rated I/O modules and modems from B&B Electronics Manufacturing Co. eliminate up to 40 miles of wiring in plant wire replacement. The IP67 outdoor-rated I/O modules and radio modems provide reliable wireless monitoring and control of sensor or serial data in harsh and remote environments. Field configuration options facilitate wireless connections (2.4 GHz short range, 900 MHz long range) to monitor temperature, pressure, level, flow or other analog or digital I/O.



Zlinx Xtreme I/O modules and modems from B&B Electronics Manufacturing Co.

Wirelessly emulating wired technology, the units mount directly to poles or machines. The license-free

RF wireless sensor transceiver technology connects data loggers, controls or SCADA equipment with up to 99 percent of sensors available. The

I/O modules provide two analog inputs, two analog outputs, two digital inputs, and two relay outputs and feature selectable I/O, both digital and analog. Configurations include point-to-point/peer-to-peer or Modbus. **800/346-3119; www.bb-elec.com.**

SELF-CLEANING SENSOR

The S8000 pH/ORP Platform from Sensorex combines a next-generation, flat-surface, self-cleaning pH/ORP sensor along with modular mounting hardware and optional electronics. The product provides accurate and repeatable pH/ORP measurements. The same electrode can be used in tank submersion or inline mounting applications to measure pH, HF resistant pH, ORP (REDOX) or low ionic pH.

The electrode incorporates double-junction ERP technology, which provides a complex path to protect the reference in the presence of interacting ions. High temperature reference gels protect against thermal breakdown. The sensor cartridge features Ryton (PPS) parts and Viton seals in a chemically resistant body. The sensor electrode measures a pH range from 0-14 at a pressure range of 0-100 psig de-rated under temperature. **714/895-4344; www.sensorex.com.**



S8000 pH/ORP Platform from Sensorex



LevelRat level transmitter from Keller America

NON-FOULING TRANSMITTER

The LevelRat level transmitter from Keller America is used for lift station level measurement. The Kynar diaphragm combines the non-stick properties of Teflon with resistance to puncture and abrasion to create a small, non-fouling level

transmitter. The device includes guaranteed lightning protection. **877/253-5537; www.kelleramerica.com.**

VERSATILE MEASUREMENT

The FreeWave IO Expansion Module measures and controls intake pumps, temperature, water levels, flow rates, pressures and chemical levels. It has a scalable IO solution with up to 12 IO points per module. Up to 15 modules can be stacked on the radio or base module, allowing up to 192 additional IO points per 15-module stack. **866/923-6168; www.freewave.com.**



IO Expansion Module from FreeWave



MOBILE PHONE APP

The i-View mobile phone application from ProSoft Technology transforms iPhone, iPad and iPod touch devices into mobile human machine interfaces using 802.11 industrial wireless or cellular solutions. The application enables interoperability between iPhone, iPad and iPod touch devices and industrial control systems. It provides real-time, remote SCADA and process control, enabling engineers to monitor and modify live control values on an Ethernet/IP or Modbus TCP/IP network. **661/716-5257; www.prosoft-technology.com.**

i-View mobile phone application from ProSoft Technology

SUBMERSIBLE TRANSDUCER

TruBlue 555 Level submersible level transducer from Pressure Systems is designed for long-term measurement of water levels. With an internal memory of 8 MB, it stores up to 550,000 level and temperature measurements. An internal 3.6V lithium battery with onboard surge protection lasts five years. The unit provides an accuracy of ± 0.1 percent.

The transducer has an RS485 electrical interface. The device is shipped with TruWare software. Users can graph and export data. The transducer sampling modes include linear, linear averaging and event, with programmable sampling rates of up to five readings per second. **800/328-3665; www.pressuresystems.com.**



TruBlue 555 Level submersible level transducer from Pressure Systems



STAINLESS STEEL CONNECTION

BinMaster Level Controls has introduced a stainless steel process connection for the BMRX and MAXIMA+ rotary level indicators, designed for use in corrosive materials. The 304 SS solid stainless steel fitting is available in 1 1/4-inch and 1 1/2-inch NPT sizes and comes with a stainless steel seal/bearing carrier.

Rotaries equipped with this connection are configured so that all materials contacting the rotary are stainless steel. The rotaries are designed for level

detection of dry bulk material storage and flow in bins, hoppers, tanks, chutes and conveyors. **800/278-4241; www.binmaster.com.**

Stainless steel process connection from BinMaster Level Controls

SINGLE-PARAMETER COLORIMETERS

Orbeco-Hellige offers SC450 Series single-parameter colorimeters, which test for a wide range of water-quality parameters. Using the open reagent system, which uses Powder Pack, stable tablets and liquid reagents, many of the instruments offer a choice of multiple ranges and reagent style platforms. Up to 16 data sets can be stored in the internal memory and can be transferred to a computer using a waterproof infrared data port. Each device is supplied with three 24-mm sample cells, required reagents and batteries. **800/922-5242; www.orbeco.com.**



SC450 Series single-parameter colorimeters from Orbeco-Hellige



CONTROL PANEL

The Eco Smart Station control panel from Best Controls Co., CSI Controls, Control Works Inc. and SJE-Rhombus provides a safe, simple, energy-efficient solution for optimum pump control in lift stations. It uses the latest in variable-frequency drive, microprocessor-based controller, data storage and communication technology. The pre-engineered solution is available in 29 models, from 10 to 100 hp.

The unit is housed in a multiple-compartment design of the Arc Armor Enclosure, reducing risk of injury from

Eco Smart Station control panel from Best Controls Co., CSI Controls, Control Works Inc. and SJE-Rhombus

electric shock and exposure to arc flash. The EnergyView controller is powered by kW Logix Software. The color touchscreen HMI provides level control, pump alternation, flow monitoring, data logging, alarm log and historical trending, and comes with an SD memory card. Multiple communication streams for remote monitoring and control are available. **800/746-6287; www.sjerrhombus.com.**

LED COLORIMETER

Lightweight and field portable, the V-2000 microprocessor-based LED colorimeter from CHEMetrics uses pre-programmed methods to measure 13-mm, 16-mm or 1-inch cells in concentration, percent transmittance or absorbance modes. With a built-in computer interface/output, the device can log 100 data points and download them to a printer or PC. Self-filling Vacu-vial reagent ampules minimize contact with chemicals and provide reliable, accurate and safe tests for more than 30 important analytes, including ammonia, chlorine and COD. **800/356-3072; www.chemetrics.com.**



V-2000 LED colorimeter from CHEMetrics



PHOTOMETER DETECTS LOW LEVELS OF LEAD

The eXact LEADQuick photometer from Industrial Test Systems uses a three-minute procedure that detects low levels of lead. The meter is waterproof and fits in hand. The built-in sampling cell and auto-timer provides convenience. The device provides accurate results with 1 $\mu\text{g/l}$

resolution and a range of 0 to 500 $\mu\text{g/l}$. **800/861-9712; www.sensafe.com.**

eXact LEADQuick photometer from Industrial Test Systems

CONTROL DATA LOGGER

The CR1000 measurement and control data logger from Campbell Scientific retains the versatility of the company's earlier loggers with a detachable wiring panel, separate power supply and optional keyboard display. It has increased memory and more measurement channels, plus an RS232 port for communication, supporting PAKBUS, Modbus, DNP3, TCP/IP, FTP and SMTP communication protocols. Built to be compatible with a wide range of sensors and communication devices, it can measure and control wastewater treatment facilities anywhere on site. **435/753-2342; www.campbellsci.com.**



CR1000 data logger from Campbell Scientific

(continued)

SUBMERSIBLE LEVEL TRANSMITTER

AMETEK PMT Products offers a low-power version of its Model 575 submersible level transmitter. The low-power requirements of the Model 575SB 1-5 VDC output sensor allow the transmitter to operate on battery or solar power. The transmitter indicates the level of the liquid by continuously measuring hydrostatic pressure via its sensing element, an ion-implanted, silicon semiconductor chip with integral Wheatstone Bridge circuit.

All electronics are mounted in a submersible 316 stainless steel housing. A special cable support bracket is available for extra stability. The unit can be calibrated for any span needed. **215/355-6900; www.ametekusg.com.**



**Model 575 transmitter from
AMETEK PMT Products**



**LevelMaster monitoring system
from EPG Companies**

LIQUID LEVELS MONITOR

The LevelMaster stand-alone liquid level monitoring system from EPG Companies monitors and displays liquid levels. It includes the EPG LevelMaster CH1000 liquid level meter and the LevelMaster liquid level sensor. Monitoring systems are available with built-in, thermostatically controlled panel heaters to maintain minimum

temperature, eliminating condensation and optimizing meter accuracy. Designs also offer options such as intrinsically safe circuitry, level sensors with additional surge suppression, Tefzel sensor cables, and a portable 12V version. **800/443-7426; www.epgco.com.**

LIFT STATION ALARM

The Viper kit lift station alarm monitor from OmniSite installs in four easy steps. The kit includes everything needed for installation, including a non-mercury float. The product has complete over-the-air programming. **317/885-6330; www.omnisite.com.**



**Viper kit lift station alarm
monitor from OmniSite**

OPEN-CHANNEL METERING

The HachFL900 Series flow logger with Marsh-McBirney Flo-Dar Sensor from Hach Company is an open-channel flow-metering system that provides users with a time-saving wireless (or standard) flow-monitoring solution. The logger and sensor streamline the flow-monitoring process by reducing site time while increasing personnel safety.

The logger provides verification of on-site operation/communication. Real-time alarms are sent directly to e-mail or mobile phones. The non-contact sensor eliminates sensor maintenance and confined-space entry while reducing monitoring costs. Wireless logger models utilize Hach FSDATA Web-based software that eliminates site visits, allowing users to easily manage flow data 24/7. The logger is compatible with the Marsh-McBirney Flo-Tote 3 sensor. **800/368-2723; www.hachflow.com.**



**HachFL900 Series flow logger with
Marsh-McBirney Flo-Dar Sensor
from Hach Company**

MULTI-PARAMETER INSTRUMENT

Model 4083 EC Meter from Amber Science is a multi-parameter instrument for measuring within aqueous solutions. It has a user-friendly interface, auto range, backlit display, and RS232 output for data logging. It operates on a 9V battery or 115V AC adapter. The non-volatile memory allows parameter set points to be saved when power is removed. Options include a remote audible alarm box that buzzes when measurements fall above or below set limits. **541/345-6877; www.conductivity-meters.com.**



**Model 4083 EC Meter
from Amber Science**



**mxCONTROL Type 8620 from
Burkert Fluid Control Systems**

AUTOMATED PROCESS CONTROL

The mxCONTROL Type 8620 from Burkert Fluid Control Systems incorporates multi-parameter, panel-mounted transmitters in single-platform, multi-parameter controllers. The unit automates the control of process variables, integrating all control, monitoring and display features and event logging functions in one compact unit.

The controller can be configured to display, transmit and record flow, pressure, pH/ORP, conductivity, turbidity, O₂, O₃, Cl₂, level and temperature through standard 4-20 mA inputs. It processes up to four analog and four digital inputs, five relay and four transistor outputs, and four optional analog outputs simultaneously. **800/325-1405; www.burkert-usa.com.**

ULTRASONIC FLOWMETER

The Flow Hunter II and XDS 03 ultrasonic open-channel flowmeter from ECHO Process Instrumentation is easy to program with the five-button keypad and quick-start menu. It comes with two relays and a 4-20 mA output in a NEMA 4X enclosure with a UV-protected clear lid. It can measure any V-notch or rectangular weir and an assortment of flumes like the Parshall or Palmer-Bowlus. **850/609-1300; www.echopi.com.**



**Flow Hunter II and XDS 03
flowmeter from ECHO Process
Instrumentation**



**RDO sensor and analyzer from
Rosemount Analytical**

DO MEASUREMENT

The RDO sensor and analyzer from Rosemount Analytical measures dissolved oxygen in water and is suited for wastewater aeration basins and ponds. Because the sensor uses an equilibrium method, fluorescence quenching, it is less affected by fouling and does not

require a flowing sample. The sensor is available with integral or quick-disconnect cable and can be calibrated against a referee instrument or in water-saturated air.

Air calibration is automatic. Maintenance consists of replacing the sensing cap every year. The analyzer accepts one or two sensors and has a customizable two-line display. It has two loop-powered 4-20 mA fully programmable analog outputs. Modbus/RS485 serial communication is also available. **800/854-8257; www.raihome.com.**

BIOLOGICAL NITROGEN REMOVAL

The BIOS (Bioprocess Intelligent Optimization System) from BioChem Technology can reduce aeration energy by up to 20 percent while maximizing biological nitrogen removal. This hardware and software solution provides real-time monitoring and control based on the dynamically changing biological activity occurring in the bioreactor.



BIOS from BioChem Technology

The BIOS monitors influent and operating data by communicating with the SCADA and in situ nitrogen (ammonia and nitrate) analyzers. It simulates the process in real time using the activated sludge model and calculates optimal DO and internal recycle rate set points for the momentary conditions and overall treatment objectives. The system can also control the WAS rate and SRT and carbon dosing for enhanced nutrient removal, where applicable. Plants using the system typically report a 15 to 20 percent reduction in aeration energy and up to 40 percent improvement in TN reduction. **610/768-9360; www.biochemtech.com.**



Master Station fieldbus from Bernard Controls

MASTER STATION

The Master Station fieldbus from Bernard Controls eases the command and control of many motor-operated valves. The system combines PLC technology, full redundancy and bus con-

tinuity. Digital communication enables users to retrieve information from field units. **312/327-5260; www.bernardcontrols.com.**

OPTICAL DO/BOD KIT

YSI Inc. offers an optical dissolved oxygen/BOD kit. The ProOBOD optical-based BOD probe works with the ProODO handheld instrument to make it a true lab/field device.

Optical technology allows users to reduce or eliminate membrane changes, calibrations, warm-up times and interferences. The probe is tapered to fit into a standard 300 mL BOD bottle in the lab.

The ProOBOD is a self-stirring device that ensures a representative sample. The ProODO instrument allows for USB connectivity to send data to a PC. The instrument can accommodate a field DO cable for versatility in instrument choice. **800/897-4151; www.ysi.com.**



ProOBOD optical dissolved oxygen/BOD kit from YSI Inc.



CSX sensor from Electro-Chemical Devices

CONDUCTIVITY SENSOR

The two-electrode CSX2 conductivity sensor from Electro-Chemical Devices measures electrolytic conductivity and is designed for high-temperature service up to 392 degrees F at 250 psig. At temperatures below 212 degrees F, the sensor is rated for pressure up to 400 psig. The unit features a 316 stainless steel outer body and center

electrode, separated by a poly ether ether ketone (PEEK) internal insulator. It has a weather-resistant aluminum junction box for easy access to the terminal strip or signal conditioner and uses a 0.75-inch FNPT connection. **800/729-1333; www.ecdi.com.**

GAS DETECTION CONTROLLER

The TA-2016MB-WM gas detection digital wall-mount controller from Mil-Ram Technology features a 16-channel system using the RS485 Modbus RTU multi-drop smarter transmitter (sensor) network. It has four relays, 10 Amp/channel, latching/non-latching function, low/mid/high fault relays, LED alarm indicators, a local buzzer, backlit 16-character by two-line LCD display, auto scrolls for channel data/fault conditions, and simple front panel, pushbutton channel setup. An eight-channel controller is available. **888/464-5726; www.mil-ram.com.**



TA-2016MB-WM gas detection controller from Mil-Ram Technology



G460 multi-sensor atmospheric monitor from GfG Instrumentation

ATMOSPHERIC MONITOR

GfG Instrumentation offers the G460 multi-sensor atmospheric monitor. A concussion-proof boot, combined with a dust- and water-resistant housing, protects the instrument. Installed sensor options include infrared (NDIR) for CO2 and PID for a direct reading of toxic VOC measurements.

It offers automatic calibration, one-button operation, top-mounted display, interchangeable battery packs, and a highly configurable smart sensor design. A wide range of additional sensors is available, including SO2, HCl, Cl2 and NO. **800/959-0329; www.gfg-inc.com.**

HANDHELD DIAGNOSTICS

The micro LM-100 laser distance meter, micro CD-100 combustible gas detector and the micro IR-100 non-contact infrared thermometer are the latest handheld diagnostic tools from RIDGID. The LM-100 laser meter provides distance readings up to 164 feet. It stores the last 20 measurements, weighs 0.5 pounds and measures within 1/16 inch. The CD-100 combustible detector detects methane, propane, butane, ethanol, ammonia, hydrogen and other gases. The IR-100 infrared thermometer provides surface temperature readings at the push of a button. It has a temperature range of -58 to 1,472 degrees F and is equipped with a tripod for repeatable measurements. **800/769-7743; www.ridgid.com.**



Handheld diagnostic tools from RIDGID

DO ANALYZER

The Model 2100SC industrial-grade dissolved oxygen combination analyzer/sensor from RELIANT Water Technologies is designed for maintenance-free use in wastewater treatment aeration basins or bioreactors. It has a multi-line, backlit digital display that continuously shows DO and temperature and active relay status. Other features include single-button automatic calibration, programmable relays, isolated analog and digital outputs, 72-hour trend graph, sensor and analyzer self-diagnostics. **504/400-1239; www.reliantwater.us.com.**



Model 2100SC analyzer/sensor from RELIANT Water Technologies

(continued)

LOW-POWER GAS SENSOR

The DM-100 low-power gas-detection sensor from Detcon monitors a range of toxic gases and can be used with the SmartWireless product line or as a stand-alone. The sensor is 4-20 mA loop-powered and detects gases from 0-1 ppm and 0-10,000 ppm. The unit uses fully encapsulated electronics housed in a stainless steel vault to eliminate water ingress and corrosion. Options include an explosion-proof junction box with field replaceable transient protection circuit, a loop-powered LED display, and an alarm relay board. **888/367-4286; www.detcon.com.**



DM-100 gas-detection sensor from Detcon

INFORMATION MANAGEMENT

Hach Company offers expanded electronic EPA filing and flexible pricing with version 7.1 release of Hach Water Information Management Solution (WIMS) software. This data management software program is designed for the drinking water and wastewater industries. The new version offers electronic reporting in all states that require or allow electronic filing. Users can eliminate paperwork by electronically filing reports.



Hach Water Information Management Solution (WIMS) software

The software includes automatic output of graphs and reports,

along with a 4 GB database with all multi-user licenses. It integrates data from many sources into one central, secure database for easy monitoring, analysis, reporting and predictive modeling. It is fully configurable to each organization. Streamlined reporting, user-defined alerts, and charting, graphing and mapping tools help users make informed decisions. **800/227-4224; www.HachWIMS.com.**

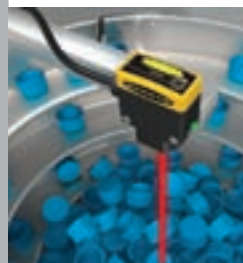
VIDEO MANAGEMENT SYSTEM

Version 5.2 of the Video Management System from Longwatch includes a Value Edition of the Console Recorder, a low-power XLP version of the Video System that delivers surveillance in remote areas, and improved database functions. The recorder monitors and records activities at up to six operator consoles, including screen displays and operator actions via the keyboard and mouse, allowing engineers and supervisors to replay an event. The low-power option enables the system to operate on solar power and batteries. **781/255-7400; www.longwatch.com.**



Video Management System from Longwatch

ADJUSTABLE-FIELD SENSORS



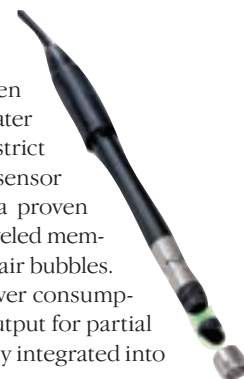
QS30AF600 suppression sensor from Banner Engineering

The QS30AFF400 foreground suppression sensor and QS30AF600 background suppression sensor from Banner Engineering use linear imager technology. The foreground suppression sensor detects targets varying in color or shape against a fixed background, while the background suppression sensor detects objects when the background is neither controlled nor fixed. It also ignores objects beyond the sensing field cutoff. The sensing range for both units can be adjusted with a screwdriver potentiometer or via remote teach wire input. A visible red LED-sensing beam ensures sensor alignment. **888/373-6767; www.bannerengineering.com.**

WATER-QUALITY SENSORS

The WQ-FDO optical dissolved oxygen sensor from the ITT Corporation Global Water Instrumentation brand helps users meet strict water-quality regulatory requirements. The sensor offers fast and precise DO measurements, a proven green-light technology for long life, and a beveled membrane that minimizes interference caused by air bubbles.

It is simple to operate and offers low power consumption and maintenance. It has dual 4-20 mA output for partial pressure and temperature, which can be easily integrated into an existing or new monitoring system. Optional stainless steel or plastic armor is available to protect the sensor in harsh environments. **800/876-1172; www.globalw.com. tpo**



WQ-FDO optical dissolved oxygen sensor from ITT Corporation Global Water Instrumentation

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Backman Appointed Managing Director for Vacon Canada

Douglas K. Backman has joined Vacon Inc. as managing director for Vacon Canada. Backman, fluent in both English and French, will be responsible for operations throughout Canada, including sales, marketing and after-market services. He brings 25 years of industry experience to his position.



Douglas K. Backman

Calgon Carbon's Ohio Plant Receives NSF Certification

Calgon Carbon Corp.'s Columbus, Ohio, plant has received certification from NSF International under NSF/ANSI Standard 61: Drinking Water System Components – Health Effects for custom reactivated carbon for potable water applications. To obtain certification, Calgon Carbon completed a multi-month process that included submission of applications and product samples, data collection and monitoring.

Teledyne Tekmar Forms Water Quality Group

Teledyne Tekmar has formed the Teledyne Water Quality Group, consisting of Teledyne Analytical Instruments, Teledyne Isco Inc., Teledyne Leeman Labs, Teledyne RD Instruments Inc., Teledyne Webb Research and Teledyne Tekmar Co. The new group will focus on providing measurement and analytical solutions for the water and water-related markets.

New Orleans Named Winner of Nash Oldest Pump Contest

The Sewerage and Water Board of New Orleans, Drainage Station No. 6, was named winner of the Gardner Denver Nash Oldest Pump Contest. The two winning pumps were installed in 1928 when the station was built. Dur-

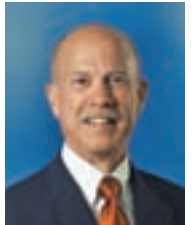
ing Hurricane Katrina, the station where the pumps were located was submerged. Once the water level dropped, the Nash pumps were started up to prime the drainage pumps, which ran for several weeks draining the city. Other contest entries included two Nash pumps that have been running in a Florida water district since 1953.

Select WAGO Terminal Blocks Earn SCCR Rating

Select WAGO Corp. through-panel and chassis-mount terminal blocks, as well as interconnect devices, have earned a 100 kA short circuit current rating (SCCR) with appropriate fuses. The newest products receiving the rating are 862 and 264 Series chassis-mount blocks, 826 and 828 Series through-panel blocks, 831 Series multi-connector system pluggable connector and X-COM's pluggable connector system.

Alfa Laval Names Atanasio President and CEO

Alfa Laval Inc. named John Atanasio president and chief executive officer. Atanasio joined the company in 1982 and holds a Bachelor of Science degree. He has completed executive management programs at Duke University's Fuqua School of Business and the Ashridge Business School.



John Atanasio

Gutierrez Joins EOSi as VP of Sales and Marketing

Maurice Gutierrez joined EOSi as vice president of sales and marketing. He brings 20 years of experience in the water treatment industry to his position. He has a Bachelor of Science degree in chemical engineering from the University of Rhode Island, served in the U.S. Navy and received a master's degree in business administration from California State University.



Bill Gaff

Vacuum Truck Rentals Names Gaff VP Sales and Marketing

Vacuum Truck Rentals and Vacuum Truck Sales and Service have named Bill Gaff vice president of sales and marketing. Gaff brings 30 years experience in the industrial and municipal markets to his position. He also serves as chairman of the board for WJTA/IMCA and is a graduate of Illinois State with degrees in business administration and finance.

Synagro Acquires HyPex Centrifuge Repair Service

Synagro Technologies Inc. acquired HyPex Inc.'s Centrifuge Repair Service, Lansdale, Pa. The acquisition enables Synagro to add maintenance, process optimization and emergency repair to its dewatering services.

Consortium Seeks U.S. Businesses for Global Projects Database

The Consortium for Global Development, through its Global Contractors Library database, seeks to match U.S. companies with projects in the \$130 billion global development market. The consortium is especially seeking small, medium and SBA 8(a) businesses. For more information on available projects and the free database listing, go to www.cfglobaldevelopment.com or www.global-contractors.com. **tpo**

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1. GENERAL MONITORS OFFERS GAS LEAK HANDBOOK

The Gassonic Technical Handbook from General Monitors explains how to incorporate ultrasonic gas leak detectors into plant fire and gas detection systems. The handbook includes applications data with respect to specific gases and application locations. It also provides step-by-step guidelines for retrofitting existing facilities. **800/330-9161; www.generalmonitors.com.**

2. LOWELL SCOTT INTRODUCES PTO-POWERED TRUNKPUMP

The 3-inch, high-volume, PTO-powered model TP-3PTV TrunkPump from Lowell Scott Enterprises Inc. is designed for one-person operation. The hydraulically powered dewatering pump is rated at 440 gpm and 26,400 gph at 40 psi and 90-foot head. **910/463-1282; www.trunkpump.com.**

3. GRISWOLD OFFERS ATEX 811 SERIES PUMPS

ATEX-compliant standard and low-flow 811 Series centrifugal pumps from Griswold Pump Co. are certified for use in explosive atmospheres containing a mixture of air and flammable materials such as gases, vapors, mists and dust. **229/226-5255; www.griswoldpump.com.**

4. BLUE-WHITE OFFERS SKID SYSTEM FOR M SERIES PUMPS

CHEM-FEED Skid Systems for M Series metering pumps from Blue-

White Industries can be floor or wall mounted. Custom universal mounting blocks and preassembled components can be stacked and are field replaceable. The system includes a self-filling calibration cylinder, flow indicator, single or dual pump, rear access to wiring components, removable drip containment trays, dual side inlets to connect multiple skids, stainless steel mounting pads, check valve and powder-coated, welded-joint construction. **714/893-8529; www.bluwwhite.com.**

5. MOYNO OFFERS CAVITY PUMP WITH CROWNED GEAR JOINT

The 2000 Progressing Cavity Pump from Moyno Inc. features a crowned gear universal joint drive train configuration, optimal torque and thrust control. The gear joints are grease-lubricated to run at 180 degrees F. The rear gear joint is located to reduce radial load on the drive shaft and bearings. It requires minimal pump disassembly to service. **877/486-6966; www.moyno.com.**

6. ASSMANN INTRODUCES MODULAR POLYETHYLENE TANK STAND

Modular polyethylene tank stands from Assmann Corporation of America can be installed on any suitable flat surface, elevating polyethylene tanks 12 inches from grade for a full drain tank without the need to pour concrete. The stands are 100 percent chemical resistant and suitable for all corrosive environments. Features include corrugated side-walls for maximum support, interlocking dovetail joints and optional

wind load anchoring points. The stands have been tested to 300,000 pounds of crush force and are available in a range of colors. **888/357-3181; www.assmann-usa.com.**

7. WILDEN INTRODUCES FULL STROKE PTFE DIAPHRAGMS

Full Stroke PTFE (Teflon) diaphragms from Wilden Pump and Engineering Co., available in all of the company's AODD pump lines, are designed to increase product displacement per stroke for greater efficiency and flow rates. The Full Stroke diaphragms use the same shaft and piston combinations as the company's standard rubber and thermoplastic elastomer diaphragms for easy retrofitting. The diaphragms are available on 1-, 1.5-, 2- and 3-inch pumps. **909/422-1730; www.wildenpump.com.**

8. PUMP-FLO INTRODUCES INSIGHT PUMP SELECTION TOOL

The Insight pump selection software tool from PUMP-FLO Solutions features fully customizable configuration, pricing and quoting capabilities. Features include scalable, Web-based, secure cloud computing technology, integration with CAD, ERP, CRM and other systems. An interactive tour is available online. **360/359-4026; www.pump-flo.com.**

9. PENTAIR OFFERS SPECTRACOOOL AIR CONDITIONERS

McLean brand SPECTRACOOOL air conditioners from Pentair Technical Products are made to cool sensitive electronics within enclosures. The units feature a dust-resistant treated coil, supporting filterless operation in most environments and a range of cooling capacities, power input and mounting options. Models provide 4,000, 6,000, 8,000, 12,000 and 20,000 Btus per hour and operate on 115, 230 or 400/460 3-phase AC power. **763/421-2240; www.hoffmanonline.com.**

10. GARLOCK OFFERS SGI SHAFT GROUNDING BEARING ISOLATOR

The SGI shaft grounding bearing isolator from Garlock Sealing Technologies protects bearings from electrical damage, lubricant loss and contamination by combining the GUARDIAN non-sparking bronze labyrinth seal and AEGIS shaft grounding ring in a single unit. **800/448-6688; www.garlock.com.**

11. SHERWIN-WILLIAMS INTRODUCES EPOXY TANK COATING

Cor-Cote HT FF epoxy coating from Sherwin-Williams Protective & Marine Coatings is designed for high temperature immersion and atmospheric applications, including tank linings and piping under insulation at both ambient and high temperatures, as well as service with gasoline, fuel oil, ethanol and other hydrocarbons. The coating contains mica-ceous iron oxide for enhanced anti-corrosion and edge protective properties. The 90 percent solids coating is resistant up to 450 degrees F in a dry environment and will perform in areas subject to wet/dry cycling up to 300 degrees F. The self-priming coating provides high build and edge retention in a single coat. **800/524-5979; www.sherwin-williams.com.**

12. RED VALVE OFFERS CHECKMATE INLINE CHECK VALVE

The CheckMate inline check valve from Red Valve Co. is designed for backflow prevention and odor mitigation. The all-rubber, maintenance-free valves are available in 4- to 72-inch sizes. **412/279-0044; www.redvalve.com. tpo**

product spotlight

Jet-Action Mixing System Keeps Tank Solids Suspended

By Ed Wodalski

The JetMix hydraulic mixing system from Siemens Water Technologies Corp. is designed to agitate slurries in digesters and sludge storage tanks as well as liquid streams with odd-sized tanks or channels.

The system is suitable for new installations, retrofits or upgrades. Its internal jetting action can deliver a mixing volume rating of up to 95 percent. Nozzles can be rotated 360 degrees from outside the tank for optimum digestion and maximum methane production.

"With the rotatable nozzle option we can do a very effective job mixing what would otherwise be considered hard-to-mix tanks," says Marc Roehl, product manager, biosolids technologies. "Since the plant operator can come in and rotate the nozzles, you can get to those hard-to-mix areas and keep everything in suspension."

The system's external pump draws liquid solids off the bottom of the tank and sends slurry out the nozzle, while recirculating solids back through the pump. An optional top nozzle controls scum and grease as well as foam and other floatables.

The system can be used in small or large plants and enables operators to schedule mixing times. That can reduce power usage by 60 to 80 percent without decreasing gas production or negatively affecting volatile solids reduction, Roehl says. The modular design allows pumps and nozzles to be combined to meet load fluctuations and application needs.

"The way the system is designed, it's very good for high solids concentrations – up to 6 to 8 percent and as high as 10 percent," Roehl says. "In difficult mixing applications, like sludge storage tanks, where the tanks might be allowed to settle for months at a time, the system is very good at coming back online and re-suspending those solids in a relatively short time."

Aside from typical pump maintenance, the system requires virtually no upkeep. Thorough mixing action saves on tank cleaning and washdown. "There are more than 300 installations in the field," Roehl says. "The technology has a proven track record." **866/926-8420; www.water.siemens.com. tpo**



JetMix hydraulic mixing system from Siemens Water Technologies

people/awards

Brian Skaife, Jeff Wellnitz and **Marc Zimmerman** of the Janesville (Wis.) Wastewater Treatment Plant received the Best Operations Award during the Wisconsin Wastewater Operators Association Conference. Joe Zakovec of Janesville received the Operator of the Year Award.

The **Roger Hawkins Water Treatment Plant** in Dyersburg received the Tennessee Water and Wastewater Association's 2010 Julian R. Fleming Award for Outstanding Water Treatment Plant.

Jeff Eger, executive director of Sanitation District 1 in Fort Wright, Ky., was named the executive director of the Water Environment Federation.

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

education

Alaska

The Alaska Water Wastewater Management Association has these courses:

- April 4-6 – Wastewater Analysis, Unalaska
- April 4-8 – Introduction to Small Wastewater Systems Provisional Level, Bethel
- April 7 – OSHA 8 Hour Hazwoper, Unalaska
- April 18-22 – Introduction to Small Wastewater Systems Provisional Level, Fairbanks
- May 10-11 – Introduction to Membrane Treatment, Anchorage
- May 10-12 – Pumps and Controls Training, Bethel

Visit www.awwma.org.

California

The California Water Environment Association has these courses:

- April 6 – O&M Infiltration and Inflow, and Line Cleaning, Eureka
- April 7 – Avoiding Common Violations, Fortuna
- May 3 – SSO Spill Volume Estimating & How to Use CIWQS (online seminar)

Visit www.cwea.org.

Georgia

The Georgia Association of Water Professionals has a Customer Service Training seminar on April 18 in Macon. Visit www.gawp.org.

Michigan

The Michigan Water Environment Association has a Wastewater Operators Seminar on May 12 in Gaylord. Visit www.mi-wea.org.

New York

The New York Water Environment Association has these courses:

- April 5 – Nitrogen Removal, Batavia
- April 6 – Anaerobic Digestion, Little Falls
- April 27 – Asset Management, Chenango, N.Y.
- May 3 – Anaerobic Digestion, Amherst
- May 4 – Asset Management, Rochester

Visit www.nywea.org.

North Carolina

The North Carolina AWWA has these courses:

- May 2-6 – Eastern Biological Wastewater Operators School, Raleigh
- May 10 – Lab Tech Day, Raleigh

Visit www.ncsafewater.org.

Ohio

The Ohio Water Environment Association has these courses:

- May 5 – Collection Systems Workshop, Lewis Center
- May 24 – Ohio Operations Challenge and Hands-On Operator Training Day, Columbus

Visit www.ohiowea.org.

Texas

The Texas Water Utilities Association has these courses:

- April 12 – Wastewater Collection, Carrollton
- April 19 – Utilities Management, San Marcos
- May 17 – Utility Safety, Gatesville

Visit www.twua.org.

Wisconsin

The Wisconsin Department of Natural Resources has these courses:

- April 5-6 – Primary Treatment, Introduction and Advanced, Chippewa Falls
- April 12-13 – Iron and Zeolite, Green Bay
- April 12-13 – Lab, Advanced, Fond du Lac
- April 19-20 – Ponds and Lagoons, Introduction and Advanced, Wausau
- April 19-21 – Surface Water Certification, Appleton
- April 26-27 – Mechanical Sludge Handling, Introduction and Advanced, Appleton
- May 2-3 – Iron, Zeolite and VOC, Fond du Lac
- May 5 – Working In The Streets: Traffic Control and Clothing, Janesville
- May 10-11 – Utility Management 2, Madison
- May 17 – Surface Water Processes, Green Bay
- May 18 – Water Supply Safety, Madison

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

The University of Wisconsin Department of Engineering-Professional Development has a course on Nutrient Removal Engineering: Phosphorus and Nitrogen in Wastewater Treatment April 26-28 in Madison. Visit www.epdweb.engr.wisc.edu.

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CALENDAR OF EVENTS

March 27-April 1

Kentucky Water and Wastewater Operators Association 2011 Conference, Galt House Hotel and Suites, Louisville. Visit www.kwwoa.org.

April 5-8

Texas Water 2011, Fort Worth Texas. Visit www.weat.org.

April 5-8

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

April 10-12

Water Environment Federation, Disinfection 2011, Hyatt Regency Cincinnati, Ohio. Call 703/684-2441 or visit www.wef.org.

April 10-12

Water Environment Association of Ontario Technical Symposium and Exhibition, Westin Harbour Castle, Toronto. Visit www.weao.org.

April 10-13

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

April 12-15

California Water Environment Association Annual Conference, Ontario Convention Center, Ontario. Call 510/382-7800 or visit www.cwea.org.

April 16-20

British Columbia Water & Waste Association Annual Conference & Trade Show, Kelowna. Visit www.bcwwa.org.

April 17-20

Maritime Provinces Water & Wastewater Association Annual Seminar, Westin Hotel, Halifax, N.S. Visit www.mpwwa.ca.

April 19-20

Georgia Association of Water Professionals Spring Conference & Expo, Macon. Visit www.gawp.org.

April 26-29

Alaska Water Wastewater Management Association Statewide Conference, Hilton Anchorage. Visit www.awwma.org.

April 30-May 4

Florida Water Resources Conference, Gaylord Palms Resort, Kissimmee. Visit www.fwrc.org.

May 9-13

New Jersey Water Environment Association Annual Conference, Bally's Atlantic City, Atlantic City. Visit www.njwea.org.

May 10-12

Montana Section-American Water Works Association Conference, Holiday Inn and Best Western GranTree Hotels, Bozeman. Visit www.montana-awwa.org.

May 17-18

Nevada Water Environment Association Annual Conference, Sam's Town Hotel and Casino, Las Vegas. Visit www.nvwea.org.

May 22-25

Water Environment Federation, Residuals and Biosolids 2011: Adapting Residuals Management to a Changing Climate, Sacramento (Calif.) Convention Center. Visit www.wef.org.

May 22-25

West Virginia Water Environment Association/AWWA Annual Conference, Oglebay State Park, Wheeling. Visit www.wv-wea.org.

May 23-24

Louisiana Water Environment Association Spring Conference, Lod Cook Alumni Center, Baton Rouge. Visit www.lweaonline.org.

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DEWATERING

2007 New Tech NT-4000E dewatering unit mounted on a 10-ton capacity trailer for septic and grease traps. It is equipped with 750 micron filter screens and is a diesel/hydraulic powered system with 3" pump, 132 gpm polymer mixing device. \$45,000. 928-300-0583 AZ. (P04)

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2000 1.5 Meter Belt Press, variable speed, complete, excellent condition, 20 yrs. in pumping business. \$27,500. Call Steve @ 503-577-7223. Portland, Or. (P05)

DEWATERING

2006 Ashbrook 2.0 Meter Dewatering Klampress Machine with 1,100 hours and Polymer mixing pump on portable trailer with conveyor. \$185,000. 901-493-6968 TN. (P05)

22-yard dewatering box w/steel rolling tops. Does not include filter media or polymer injection system. Asking \$23,000. 770-917-0377 GA. (PBM)

EDUCATION

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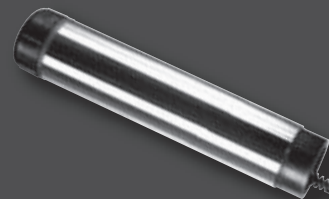


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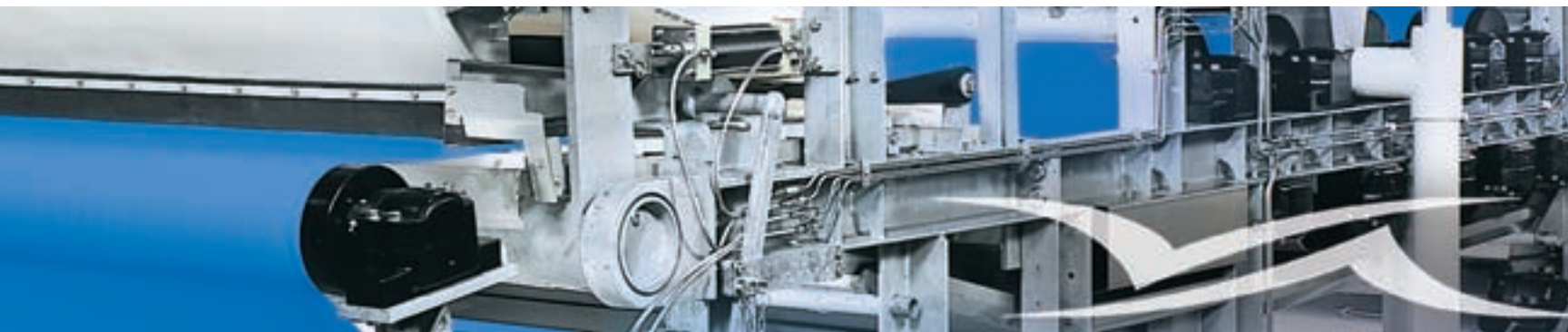
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Wet H₂S Monitor

Odor Control Monitor

Q45S

The Q45S provides the solution for monitoring H₂S in wet environments typically found in scrubbers. A specifically designed wet gas sensor measures in moisture saturated atmospheres where other standard gas sensors typically fail.



- Special Sensor for Wet Gases
- Optional Air Purge for Long Term Sensor Operation
- Multiple Power Configurations

Auto-Clean pH/ORP

Sensor Cleaning Problems?

Q45P/R

Q45P/R Monitors enhance the reliability of long term pH or ORP measurement by providing automatic sensor cleaning. Effective on biological slimes, oily coatings and other non-crystalline buildups, sensor maintenance is greatly reduced.



- Air Blast Sensor Cleaning System
- Programmable Auto-Clean Interval
- Self-Contained Air Supply
- Differential pH and ORP Sensors

Dissolved Oxygen Monitor

Process Control Starts With Reliable Measurement

Self-Cleaning DO system greatly reduces maintenance headaches.



- Dissolved Oxygen Monitoring Without the Maintenance
- "Air-Blast" Sensor Cleaning Insures Accuracy and Reliability
- Save Power and Improve Aeration System Performance
- Guaranteed Performance in Any Aeration Environment

Dissolved Ammonia Monitor

Unique Measurement Approach

Q45N

The Q45N uses reaction chemistry that converts ammonia in solution to a stable monochloramine compound equivalent in concentration to the original ammonia level. The measurement is then made with a unique amperometric sensor.



- New Approach to On-Line Ammonia Measuring
- Total Ammonia Measurement
- Optional Free Ammonia and Monochloramine Measurement
- 4-20 mA Outputs and Alarm Relays

Total Residual Chlorine Monitor

Amperometric Measurement

Q45H/79

The Q45H/79 provides highly accurate measurement of total residual chlorine down into the parts per billion range. Total chlorine is measured using EPA recommended method for reaction of the sample with butler and KI.



- Uses a Direct Reading Membrane Amperometric Iodine Sensor
- High Accuracy and Sensitivity Down to PPB
- 2-Assignable 4-20 mA Outputs Configured for Chlorine, Temperature or PID Control

Wastewater Measurement Solutions

Quality, Price & Performance

Residual Sulfite Monitor

Save \$1000's of Dollars in Dechlorination Costs

A15/66 Dechlorination Monitor

Can Greatly Reduce Chemical Usage

Stop needlessly wasting chemicals by guessing sulfite levels in your dechlorination process. Continuously monitor and control dosage of costly chemicals and run your process more efficiently, knowing that all chlorine has been eliminated.

- Continuous Monitoring Insures Complete Dechlorination
- Reduces Chemical Usage by Allowing The Process to Operate at Low Sulfite Levels
- Gas Phase Measurement, No Process/ Sensor Contact
- Low Maintenance Membrane Sensor



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