TREATMENT PLANT OPERATOR

Hearts and Minds: An online education library

PAGE 20

Tech Talk: Seeing the total system PAGE 56

DEDICATED TO WASTE<mark>WATER &</mark> WATER TREATMENT PROFESSIO

www.tpomag.com OCTOBER 2014

In My Words: Revenue by the truckload

PAGE 62

Provide the second seco

Doug Brooks Chief Operator Owenton, Ky.

YOUR PROCESS. UNDER CONTROL.



A conventional activated sludge plant using Hach's RTC-N to control nitrification. Area in green indicates total savings.

Why overtreat? Simply set your process control limits and let RTC do the rest.

Situation:

Over treating gets the job done and keeps your facility compliant, but it wastes money. Whether you're removing phosphorus, controlling nitrification or treating sludge, there is a more sustainable way to manage your processes.

Action:

Using tools you already know, Hach's Real-Time Control (RTC) Systems monitor and optimize your process minute by minute, treating only what you need.

Results:

By treating only what you need your facility operates efficiently, meeting permit limits and reducing operating costs.

To learn your savings potential with RTC, visit: hach.com/RTC

Phosphorus Removal | Nitrification Control | Sludge Treatment











See the full capabilities of the solutions from Xylem's Flygt during WEFTEC 2014 in New Orleans September 29th - October 1st, in booth #4329

Flygt MultiSmart brings a state-of-the-art Pump Station Manager to Xylem's innovative offering within Monitoring & Control. With up to 35% reduction in energy consumption, it can pay for itself in less than 15 months. It also eliminates nuisance call-outs and provides a wealth of operational information.





At Neptune, we offer design and manufacturing expertise all under one roof! No matter the size of the project – from a single metering pump to the most advanced custom chemical feed systems -Neptune's products are backed by an experienced engineering team ready to serve and support you.

- Hydraulic Diaphragm Metering Pumps backed by a 3-year warranty
- Self-priming Mechanical Diaphragm Pumps with excellent suction-lift capabilities
- Electronic Metering Pumps with 300 strokes per minute providing more even distribution of chemical and greater turn down
- Engineering capabilities offer custom and semi-custom systems to fit your needs





Neptune

PSG North Wales 295 DeKalb Pike North Wales, PA 19454 O: +1 (215) 699-8700 F: +1 (215) 699-0370 info@neptune1.com

www.neptune1.com



USA

advertiser index **OCTOBER 2014**

AdEdge Water Technologies, LLC 83

Aerzen USA	25	
Agru America, Inc	55	
All-Star Products	53	
AIIMAX		
AllMax Software, Inc	75	

American Pleasure Products, Inc	81
AmTech Tank Lining & Repair	58

Analytical Technology, Inc	57	
Aqua Ben Corporation	4	
Assmann Corporation of America	77	

BASE

BASF Corporation – Water Solutions Division	49	
BDP Industries, Inc Biowater Technology	73 38	

Blue-White

Blue-White Industries	45	
Bright Technologies	83	



Carylon Corporation	39	
Chemineer	29	
Chlorinators Incorporated	53	
CST Industries	59	
DEL Tank & Filtration Systems	65	
Enviro-Care Company	10	





Flo Trend Systems, Inc. 69

FLYGT

a xylem brand		
Flygt – a Xylem Brand	3	
Force Flow/Halogen	8	
Ford Hall Company, Inc	55	
Fournier Industries, Inc	81	

Gi

Gardner Denver 71 GR

PUMPS Gorman-Rupp Company	31	
Grace Industries, Inc	71	
HACH		
Hach Company	2	

Hawk Measurement America 75

HUBER Huber Technology, Inc. 7 Hvdro International 30 Imperial Industries, Inc. 70 INFILCO INFILCO DEGREMONT 21 S JDV Equipment Corporation JDV Equipment Corporation 75 Keller America Inc. 27 KOHLER Power Systems 13 Komline-Sanderson Komline-Sanderson 86 KSB, Inc. 26 **∢((UHN)**► LAKESIDE Lakeside Equipment Corporation ... 51 Lutz-JESCO America Corp. 77 McNish Corporation 69 Moyno 11 Nasco Nasco Neptune Chemical Pump Company 4 NETZSCH NETZSCH Pumps North America, LLC 29 OVIVO Ovivo USA, LLC 5 Parker Boiler 81 -17-Pollardwater Pollardwater 88 Red Valve Co. / Tideflex Technologies 17 ROTO-MIX Roto-Mix, LLC 58 SAD Smith & Loveless, Inc. 87 SRS Crisafulli, Inc. 38 Tank Connection Affiliate Group 44 Vaughan[•] Vaughan Company, Inc. 19 Walker Process Equipment, A Div. of McNish Corp. 65

YSI, a Xylem brand 9

CLASSIFIEDS 86

Henry Pratt Company 41 Heron Innovators 61



WHY GO WITH THE SAME OLD FLOW?

Ovivo is constantly innovating products and solutions in an effort to improve performance, increase production and save you money! After over 200 years, we've gotten pretty good at it.

Come visit us at WEFTEC 2014 (Booth #3629) and see the future of water & wastewater management.

1-855-GO-OVIVO www.ovivowater.com





Latest innovations:



Ovivo® MBR

Starting with a range of headworks options and ending with membrane-based solids management, each Ovivo®MBR can be an integrated, total solution to a wastewater treatment problem or reuse opportunity.



A.R.T.S. (Aerobic Retrofit Treatment System)

Reduce energy use, basin requirements & maintenance costs while increasing clarification, nutrient removal & plant capacity.



INLET SCREEN

The Ovivo® Duet screen provides a very low operating cost alternative and the highest capture & removal efficiency on the market without the need for upfront pre-screens and grit removal systems.

ontents October 2014







on the cover

Doug Brooks, chief operator at Kentucky River Station II at Hardin's Landing water treatment plant in Owenton, Ky., is always helping others. That includes assisting with Kentucky American Water's annual Waterfest, pitching in on the

Kentucky River cleanup, or working as a volunteer firefighter. (Photography by Shaun Ring)

LET'S BE CLEAR Page 8 A Wave Is Rolling

The more you look around, the more you see clean-water plants looking to fulfill their whole potential as centers for water reclamation and resource recovery.

By Ted J. Rulseh, Editor

LETTERS Page 10

@TPOMAG.COM Page 12

Visit daily for exclusive news, features and blogs.

HEARTS AND MINDS Page 20 **All-Out for Education**

A Florida water management district brings an extensive online library of educational materials to teachers, the general public and other agencies. By Linda J. Edmondson

HOW WE DO IT: WASTEWATER Page 28 **Process Protection**

A specially designed receiving station enables an Illinois village to receive septage as a source of revenue without creating treatment plant process issues. By Ted J. Rulseh

PERSPECTIVE Page 32 As the World Warms

Will hotter summers from climate change create a healthy environment for unhealthful organisms in sediment at the bottom of water tanks and towers? By Ron Perrin

HOW WE DO IT: WATER Page 40 **Pumping Up Efficiency**

A Rhode Island town expects payback of 3 1/2 years on an extensive project to upgrade inefficient pumps and install variable-frequency drives. By Chris Champi, Rob Little, P.E., and Mark Donovan

top performers:

WATER: PLANT

Small Town, Not Small Tech Page 46

Technology helps a water system in rural South Dakota operate efficiently, deploy effective treatment methods and deliver quality customer service. By Jim Force

WASTEWATER: OPERATOR

Still a Teacher Page 34

Kam Reeves applies education, coaching and lead-by-example principles to his superintendent's job at the Ottumwa Water Pollution Control Facility. **By Jack Powell**

WASTEWATER: BIOSOLIDS

Seeking Higher Levels Page 14

The Trinity River Authority looks to major advances in a biosolids program that already earns high marks for environmental quality and customer satisfaction.

By Ted J. Rulseh

WATER: OPERATOR

Pitching Right In Page 22

Whether on the job with Kentucky American Water or suiting up as a volunteer firefighter, Doug Brooks puts heart and soul into his work. By Trude Witham

SUSTAINABLE OPERATIONS Page 42 **Reusing More, Using Less**

A Maine composting facility creates beneficial recycled products and does it with less energy, thanks to innovations like geothermal heating and cooling.

By Doug Day

PLANTSCAPES Page 54 **Cleaning by Contest**

A friendly competition among team of plant workers keeps the Orem treatment facility clean and looking sharp for visitors. By Jeff Smith

TECH TALK Page 56 **Seeing the Big Picture**

A total systems approach to wastewater treatment helps industrial facilities develop solutions that cost-effectively meet permit compliance and business objectives.

By Chandler Johnson

TECHNOLOGY DEEP DIVE Page 60 Up to the Challenge

Koch Membrane Systems offers a hollow-fiber ultrafiltration system designed to function efficiently on feedwaters high in solids, color and TOC. By Ted J. Rulseh

IN MY WORDS Page 62

Revenue by the Truckload A Pennsylvania treatment facility helps make up for income lost with industrial plant closings by installing an efficient receiving facility for septage, grease and sludges. By Ted J. Rulseh

PRODUCT FOCUS Page 66

Tanks, Structures and Components By Craig Mandli

CASE STUDIES Page 72

Tanks, Structures and Components By Craig Mandli

INDUSTRY NEWS Page 77

PRODUCT NEWS Page 78

Product Spotlight: No-valve metering pumps / Portable E-Z Turn davit crane By Ed Wodalski

CONTRACTS AND AWARDS Page 82

WORTH NOTING Page 84

People/Awards; Education; Events

coming next month: November 2014

Product Focus: Wastewater Treatment Systems

- > Let's Be Clear: Showing pride in clean-water plants
- >> Top Performers: Wastewater Operator: Staying ahead of the regulations in Asheboro, N.C.

Wastewater Plant: Putting knowledge to work in the Florida Keys

Wastewater Plant: Biological nutrient removal in Clinton, Iowa

Water Plant: Energy savings in Roanoke, Va.

- > How We Do It: Radio communication in Rapides Parish, La.
- > How We Do It: CoMag process for phosphorus removal
- >> Sustainable Operations: Green buildings and processes in Calgary, Alberta
- > In My Words: Getting help with biogas-fueled cogeneration
- >> PlantScapes: Creating an oasis in Henderson, Nev.
- >> Hearts and Minds: Pet waste management in Northeast Ohio



See the RoS3Q displayed at wefter 2014 Booth #7529

Looking for RELIABLE DEWATERING?

you FOUND THE SOLUTION

RoS3Q Inclined Screwpress

- Efficient and reliable operation
 - Minimum operator attention
 - Simple slow rotational design
 - Energy efficient low hp motor
 - High performance sludge dewatering
 - Compact entirely enclosed machine
 - Stainless Steel construction



Learn more at huberforum.net/ros3q

solutions@hhusa.net • 704.990.2054

GRIT

SOLUTIONS FOR:





SCREENING

SLUDGE



Emergency Valve Actuator Replaces Gas Scrubber • Gas Detector or Manual Activation Fire Code Approved for Toxic Gases • Fail-Safe Battery Operated System (925) 686-6700 • (800) 893-6723 www.halogenvalve.com



DEDICATED TO WASTEWATER & WATER TREATMENT PROFESSIONALS

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

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

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

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

Non-qualified subscriptions are available at a cost of \$60 per year in the United States and Canada/Mexico and \$150 per year to all other foreign countries. To subscribe, visit tpomag.com or send company name, mailing address, phone number and check or money order (U.S. funds payable to COLE Publishing Inc.) to the address above. MasterCard, VISA and Discover are also accepted. Include credit card information with your order.

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

Our subscriber list is occasionally made available to carefully selected companies whose products or services may be of interest to you. Your privacy is important to us. If you prefer not to be a part of these lists, please contact Nicole at nicolel@colepublishing.com.

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

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

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

CIRCULATION: 72,241 copies per month.

© 2014 COLE PUBLISHING INC. No part may be reproduced without permission of publisher.

A Wave Is Rolling

THE MORE YOU LOOK AROUND, THE MORE YOU SEE CLEAN-WATER PLANTS LOOKING TO FULFILL THEIR WHOLE POTENTIAL AS CENTERS FOR WATER RECLAMATION AND RESOURCE RECOVERY

By Ted J. Rulseh, Editor



ot long ago, a couple of *TPO* colleagues and I toured the clean-water plant in Stevens Point, Wis. What we saw there was impressive (you read about it in the September issue), and yet in various ways it was not at all unusual.

The team at Stevens Point is going all out to save energy, produce energy (with combined heat and power), reuse effluent and, perhaps in the not-too-distant future, harvest nutrients from wastewater to create a marketable fertilizer, something fully separate from the Class B biosolids the plant already supplies to farmers.

And speaking of biosolids, the plant feeds its anaerobic digesters

with wastes from local brewers, food processors and dairies, increasing the volume of biosolids and of methane gas, which fuels the generator that supplies nearly all the plant's energy. A plan is in the works to pipe waste from a fast-growing brewery directly to one of the digesters. That will give gas production another boost and enable the plant to land solidly in energy-positive territory.

It's an interesting story about a great plant team, but the most interesting thing is how mainstream it all now appears. Look around the industry today and you see fewer and fewer "sewage plants" and more and more of what the Water Environment Federation calls "water resource recovery facilities."

HUGE POSSIBILITIES

Using the resources inherent in wastewater makes incredible sense. Take biogas for just one example. The 2014 Biogas Market Snapshot from XPRT Media says the United States contains the world's greatest untapped potential to use that fuel.

The report says that although more than 1,500 of the nation's clean-water plants have anaerobic digesters, only about 250 use the biogas; the other 1,250 flare it. All told, between clean-water plants, farms and various sources of urban organic waste, the report says the U.S. could produce nearly 70 million megawatt-hours of renewable electricity per year from biogas.

By my dinner-napkin calculation, that's the amount produced by eight large coal-fired power plants. That alone won't resolve all the country's energy challenges, but in a time of concern over climate change, a clean and renewable fuel like biogas has to be looked at seriously.

MORE IN THE STREAM

And biogas is only one part of the picture. There's all kinds of progress toward better-quality biosolids — not the Class B kind used only for animal feed crops and trees and mine reclamation, but the Class A material people can use right on their lawns and gardens. One increasingly attractive option is solar biosolids drying, a highly sustainable practice.

That's to say nothing about the nutrients — nitrogen and phosphorus — carried in the wastewater. Processes now available can capture those nutrients in the form of a granular, slow-release, marketable fertilizer. The purveyor of one such process says it can remove up to 90 percent of the phosphorus and 40 percent of the ammonia from centrate or filtrate from biosolids dewatering.

Then of course comes the resource that is the plants' reason for being: the water. As drought paralyzes California and other states, we see more communities studying the full reclamation of wastewater, not just for landscape irrigation but for drinking or, at the minimum, recharging groundwater aquifers.

IT'S ABOUT THE PEOPLE

And who are the people doing all this? They're the folks often perceived by the public as the guys and gals in dirty jeans at that smelly place on the dead-end road outside town. In other words, clean-water operators. The more progress

Look around the industry today and you see fewer and fewer "sewage plants" and more and more of what the Water Environment Federation calls "water resource recovery facilities."

they make toward energy production and resource recovery, the more the public will see them for who they really are.

That is, men and women often with two-year associate, four-year college or advanced degrees. People who, whatever their formal education, have become experts in microbiology, chemistry, mechanics and other disciplines, while effectively deploying, operating and maintaining a host of sophisticated machines and systems.

They're dedicated not just to meeting their discharge permits but to getting the absolute most from their facilities, in ways that safeguard the environment and treat ratepayers fairly. Thanks to them, and their initiative, we're on the way toward a time when fully optimized, truly outstanding facilities are the rule, not the exception. **tpo**



www.facebook.com/TPOmag www.twitter.com/TPOmag www.plus.google.com www.youtube.com/TPOmagazine www.linkedin.com/company/ treatment-plant-operator-magazine

in



a xylem brand

TECHNOLOGY REDUCES MAINTENANCE AND SAVES TIME



IQ SensorNet 2020 XT



Visit us at

WEFTEC

IQ SensorNet with UltraClean® Technology

Monitor and control your wastewater process with our advanced water quality monitoring network. Incredibly flexible with multiple parameters and outputs, easy to use, and ideal for any size facility. Our unique ultrasonic technology on TSS and UV/VIS sensors prevents fouling. Reduce maintenance, save time, improve data.

Booth #4329 \$

800 897 4151 US +1 937 767 7241 YSI.com/IQ • info@ysi.com

YSI Incorporated is a brand of Xylem, whose 12,900 employees are addressing the most complex issues in the global water market. ©2014 Xylem Inc.

xylem

On the reclamation imperative

"When the well is dry, we know the worth of water." — *Benjamin Franklin* Since I live in a desert and manage a facility that produces drinkingquality water from raw wastewater, I am obviously going to be biased toward reclamation being the default ("The Reclamation Imperative," *TPO*, August 2014).

Treatment to a higher level is not cheap by any means. However, we should not compare that cost to what it takes to pump and disinfect ground-water or treat surface water. The justification is based on future costs, when (in our case) desalination or source water importation may be required. All clean water produced at this facility goes to reuse, whether for power plant cooling, irrigation, construction, or reinjection into groundwater. We have been doing this for 29 years without issue. This is considered indirect potable reuse because the water is delivered to the aquifer before being recovered as potable.

As you stated, the typical quality of treatment plant effluent is very good and getting better. All four wastewater treatment plants in this city have been producing and dispensing reclaimed water for quite a long time, but we can think of taking this even further. Our utility is planning additional treatment capability at our largest clean-water plant. The intent is to produce drinking-quality water for direct potable reuse.

There are several direct potable reuse projects permitted in Texas. One is the result of an emergency permit due to the drought conditions. Those folks are starting to realize the true worth of water. Does it not make sense for us to maximize our resources earlier rather than later to avoid emergencies?

I was recently on a shuttle bus and overheard two gentlemen who were residents of that community. This was a few days before the water utility



there was to start delivering treated effluent directly to the town's drinking water distribution system.

The terms these men used when referring to the treated effluent were disparaging, to say the least. They were obviously not happy with the notion that wastewater plant effluent was to piped directly to their homes and workplaces. I cannot really blame them if they have not been informed of the quality of the water produced, the qualifications of the treatment professionals involved and of the monitoring requirements imposed by regulations.

I was at this water reclamation plant on day one of water production and am still here three decades later. I have intimate knowledge of the operation and maintenance costs of recycling this precious resource. But this is not much different than using preventive maintenance to extend the useful life of plant equipment, or personal equipment such as a car. It involves either investing a little more now, or much more later. And this has to include education of the general public, tying closely to the Fire Chief Project. Convince the general public that funding these efforts is good for all, before the well is dry.

I did comment to the guys on the shuttle bus that they could rest assured that highly qualified professionals stand vigilant over the processes necessary to ensure the quality of the water delivered to their homes.

Vick Pedregon, Superintendent Fred Hervey Water Reclamation Plant El Paso, Texas

Just too costly

Here's my two cents on the reclaimed water issue. I already have provision in my NJPDES discharge permit for what the state calls "beneficial reuse" (reclaimed water). However, depending on the intended use of this water, there are different quality standards it must meet.

If it is to be used for irrigation where the public could come in contact with it, I must treat it to an even higher degree than is required to just discharge it into the receiving stream. I operate an 8 mgd tertiary nitrification process.

The ammonia levels in our effluent are generally below 0.1 mg/L, but our effluent nitrogen levels average about 30 mg/L to achieve this. I have a stringent ammonia limit in the summer months, but no nitrogen limit (yet). The beneficial reuse requirements are 10 mg/L of total nitrogen, so I would have to initiate denitrification. There are similar issues with fecal coliform and TSS.

The WMUA did a study on potential customers for reclaimed water in our area, and there were a lot of zeroes on the end of the price tag to build the infrastructure to get it there. No one wanted to pick up the tab. While the shortage of water in some areas of the U.S., like the Southwest and Florida, is driving this concept there, water supply is not an issue in central New Jersey at this time.

So, bottom line, unless there is a market for the water and someone is willing to pay for the infrastructure and production costs, it doesn't work for us. However, several miles downstream from my outfall is a water treatment plant, so in a way, our effluent is being reclaimed.

Dane Martindell, Facilities Manager Western Monmouth Utilities Authority Manalapan, N.J.



Availability

We are the world's largest manufacturer of progressing cavity pumps. So it's not surprising that we also offer over 3,000,000 high quality, precision-engineered parts that fit in other brands of progressing cavity pumps.

With comprehensive inventories held throughout our international facilities and global distribution network, this provides fast turnaround to keep your pumps and processes running at peak efficiency.





weftec 2014

VISIT US AT BOOTH 3115



Otpomag.com

Visit the site daily for new, exclusive content. Read our blogs, find resources and get the most out of TPO magazine.



NATURAL APPROACH A Wastewater Wetland Experiment

At first glance, the George Shannon wetlands system looks no different than other low-lying marshes. Water birds roost in old oaks and pelicans wade across shallow ponds. But this man-made marsh has another purpose: Its sedges, rushes and other plants are slowly converting effluent-dominated water into drinking water. Learn more about this massive project and how it could signal a change in how we treat water. www.tpomag.com/featured

OVERHEARD ONLINE

"Though made of steel and concrete, your treatment facility might not be as inflexible as it seems. An older facility likely has mothballed or off-line pumps, tanks and mixers that can be put to new uses."

Operator Solution Center: How to Think Outside the Pipe www.tpomag.com/featured

CENTENNIAL CELEBRATION Happy 100th, Evanston Water!



In 1870, Evanston, Ill., was a sleepy farming community on the outskirts of Chicago.

But then came the Great Chicago Fire in 1871, which pushed many survivors into the community. Combine a growing population with a high risk of fires, cholera epidemics and more, and Evanston knew it had to address its water situation. Learn more about the city's water plant — and its colorful history — as it celebrates a century of providing clean water.

www.tpomag.com/featured

KING COUNTY TUNES It's All Flushing Awesome

With tipping fees steadily increasing, King County, Wash., knew it had to do



something to change customer behavior. The resulting wastewater-themed Macklemore parody — *This is Flushing Awesome* — has quickly become a regional favorite, garnering more than 11,000 views on YouTube. Learn more about King County's approach and take a look at the video. But be aware: You'll probably catch yourself humming along in no time.

www.tpomag.com/featured

Emails & Alerts

Join the Discussion

www.facebook.com/TPOmag

www.twitter.com/TPOmag

Visit www.TPOmag.com and sign up for newsletters and alerts. You'll get exclusive content delivered right to your inbox, and you'll stay in the loop on topics important to you.

IT SAVES THE DAY. AND YOU LOOK LIKE THE HERO.

KOHLER

 TOTAL SYSTEM INTEGRATION

 GENERATORS
 TRANSFER SWITCHES
 SWITCHGEAR
 CONTROLS

This is a KOHLER_☉ power system. And it's built to perform. How do we know? We engineered it ourselves. Generators, transfer switches, switchgear, controllers – you name it, we make it. Every part is designed to work with the entire system.

So when the grid goes down, you'll be glad you spec'd Kohler.

SPEC YOUR JOB AT KOHLERPOWER.COM/INDUSTRIAL

SEE US AT WEFTEC 2014 • BOOTH 8703

1111





The Trinity River Authority's Central Regional Wastewater System produces Class A biosolids for beneficial use on cropland. The future may include a thermal hydrolysis process yielding an even higher-quality Class A product.

Seeking Higher-quality Class A product. This product.

THE TRINITY RIVER AUTHORITY LOOKS TO MAJOR ADVANCES IN A BIOSOLIDS PROGRAM THAT ALREADY EARNS HIGH MARKS FOR ENVIRONMENTAL QUALITY AND CUSTOMER SATISFACTION

STORY: Ted J. Rulseh PHOTOGRAPHY: Jimmy Alford

AN EXCELLENT BIOSOLIDS BENEFICIAL USE PROGRAM in Texas is about to get even better.

The Trinity River Authority's Central Regional Wastewater System, which now applies some 69,000 dry tons per year of dewatered Class A biosolids to nearly 90,000 acres of cropland, is planning major advances in the solids side of its process in the next four years.

The net result likely will be a lower volume of a higher-quality material, saving on hauling costs and opening possibilities for new uses, such as for lawn and landscape fertilizer. The planning is still underway and many details remain to be decided. What's certain is that the authority will continue improving its solids processes with an eye on changing regulations and the use of technology to enhance sophistication.

"Much of what I tell you about our solids process today may no longer be true four or 4 1/2 years from now," says Bill Tatum, project manager for the Central Regional system. "We started a solids master plan in 2009 and carefully evaluated six alternatives. The option with the highest opportunity for return on investment included thermal hydrolysis and anaerobic digestion — technologies that create new opportunities for our treated solids stream. We still have to determine exactly what those opportunities may include."

TEXAS-SIZED TERRITORY

The Trinity River Authority (TRA) of Texas is a conservation and reclamation district that provides water and wastewater treatment along with

Trinity River Authority, Central Regional Wastewater System, Dallas, Texas

FOUNDED: 1959	
POPULATION SERVED: 1.2 million	
PLANT FLOWS: 162 mgd design, 130 mgd average	7
PLANT PROCESS: Activated sludge, tertiary filtration	
BIOSOLIDS PROCESS: Dewatering, lime stabilization	
BIOSOLIDS VOLUME: 69,000 dry tons per year	
BIOSOLIDS USE: Land application (hay fields)	
WEBSITE: www.trinityra.org	
GPS COORDINATES: Latitude: 32°46'38.35" N; longitude:	96°55′47.16″ W

recreation and reservoir facilities for municipalities in the Trinity River basin. The basin, spanning some 18,000 square miles, cuts a generally northsouth swath across east Texas with Dallas-Fort Worth at its approximate geographic center.

The authority operates five wastewater treatment plants and six watersupply systems. The Central Regional Wastewater System, by far the largest with 162 mgd design capacity and 130 mgd average flow, serves 21 cities including Arlington, Irving, Grand Prairie and part of western Dallas, about 1.2 million people in all.

Water released from the Central Regional Wastewater System has had 99 percent of all pollutants removed. Contraction of the





The Central Regional system has beneficially used biosolids since 1996. The biosolids from the other four wastewater treatment plants (design capacities 3 to 24 mgd) are landfilled. "Every time we do a master plan for those facilities, we look at the business case," says Julie Hunt, P.E., assistant manager of operations for the TRA's Northern Region. "Right now, the business cases for those four plants indicate that it's more economical for our customer cities if we take the biosolids to the landfill."

ANOTHER GREAT PERFORMER

While the Central Regional Wastewater System runs an exemplary biosolids reuse program, the Trinity River Authority's Ten Mile Creek Regional Wastewater System is outstanding in its own way.

The system received the 2012 Ronald B. Sieger Biosolids Management Award from the Water Environment Association of Texas for a project conducted with the Alan Plummer Associates engineering firm. Projects there dealt with various issues that faced the plant several years ago.

A new dewatering facility ended the practice of storing biosolids on site, eliminating an odor source and ending a cycle of storage basin clean-outs needed to keep storage space available. TRA turned one of three former biosolids storage basins into a wet-weather influent storage facility, using the existing footprint and levee system. The added storage helps prevent sanitary sewer overflows from the 24 mgd (design) treatment plant. The dewatering facility itself is state of the art. To create the wet-weather storage, TRA sampled and tested the biosolids in one surface storage cell for the Texas Commission on Environmental Quality. The biosolids met the TCEQ Class A requirements, qualifying it for land application at a considerably lower cost than for landfilling — the management method practiced by the Ten Mile Creek system.

The dewatering facility includes a blend tank, a waste sludge storage tank, gravity belt thickeners, centrifuges and ancillary equipment. Waste activated sludge is now thickened separately, freeing capacity in existing gravity thickeners to handle primary sludge only. That increases thickening effectiveness on both sludges and extends gravity thickener service life.

Looking ahead, a second sludge storage basin is available for conversion to wet-weather storage, and the plant's anaerobic digesters will be refurbished with new covers and a new heating and mixing system to improve process consistency and maximize biogas production. [With thermal hydrolysis] you can get 60 to 65 percent volatile solids reduction, which is a major reduction. You get methane gas, and you get an odorless Class A biosolids on which biological regrowth will not occur." BILL TATUM

TERTIARY PROCESS

The TRA's Central Regional system discharges excellent-quality effluent to the Trinity River with a tertiary treatment process. Influent passes through coarse and then fine bar screens, removing debris down to about 6 mm. Two pump stations, each rated 350 mgd, deliver screened wastewater to parallel north and south treatment trains that begin with grit removal, followed by settling in eight primary clarifiers.

Primary effluent enters 12 aeration basins, each holding 3 million gallons, with fine-bubble diffusers. The outflow from each basin enters two

secondary clarifiers with traveling bridges that siphon activated sludge for wasting or return to aeration. (In a year or so, the TRA plans to add anaerobic selector technology to the aeration process for phosphorus removal.)

Flow from the final clarifiers passes to tertiary filtration, where 30 sand filters are being progressively replaced by AquaDiamond cloth media filters (Aqua-Aerobic Systems). "We are retrofitting the cloth filters in the existing sand filter basins," says Tatum. "The sand filters are rated at 7.5 mgd, whereas we can get 25 mgd off the Aqua-Aerobic filters. A master plan 10 years ago called for adding 10 more sand filters, but in 2005 we switched gears and looked at the cloth filtration technology. Instead of adding more sand filters, we will ultimately have 16 cloth media filters in those 30 sand filter basins. At present, we have 10."

Final effluent from the filters typically contains about 1.0 mg/L BOD and 1.0 mg/L TSS. The effluent is disinfected with chlorine for a 20-minute contact time and dechlorinated with sulfur dioxide before discharge to the river.

PROCESSING SOLIDS

On the solids side, primary sludge is gravity-fed into four gravity thickeners. For waste activated sludge, a dissolved air flotation process is being phased out in favor of gravity belt thickeners (Alfa Laval Ashbrook Simon-Hartley). Four 2-meter units are in place, and two 3-meter units are being installed.

The thickened primary and waste activated sludges contain 4 to 4.5 percent solids. "Those are mechanically mixed in two sludge-blending tanks of about 125,000 gallons each," says Tatum. "The blended sludge is drawn out by pumps for dewatering."

There are two separate dewatering processes. About one-fourth of the material is conditioned with ferric chloride and lime and dewatered on three 2-meter Passavant Chamber filter presses (Bilfinger Water Technologies). "We have a dose rate of about 25 percent lime and 5 to 6 percent ferric chloride," says Tatum. "We wind up with about 43 percent solids cake. That material drops out of the filter presses directly into trucks we own. We haul it to an area where it is stored for five to seven days, after which it is agronomically applied as Class A biosolids to hay ground in the Dallas-Fort Worth metroplex area."

The balance of the biosolids is dosed with polymer and dewatered to about 26 percent solids on four 2-meter belt presses (one Andritz, three Alfa Laval Ashbrook Simon-Hartley). In the next two to three years, TRA proposes to add two more belt presses to replace the filter press dewatering process.

"When the material comes out of the belt presses, we convey that to a lime stabilization process [RDP Technologies]," says Tatum. "We add pulverized lime at a dose rate of about 30 percent and mix the material with thermal blenders. Then we hold it for 30 minutes in a pasteurization vessel to achieve the temperature required to qualify it as Class A."

Material coming out of the pasteurization vessel is placed in piles, then



Tideflex® Technologies | 600 N. Bell Ave. | Carnegie, PA 15106 | 412.279.0044 | www.tideflex.com



stored in bins for 24 hours and monitored to verify the required pH for Class A status (pH 12 for two hours, pH 11.5 for 22 hours).

TO THE LAND

Contractor Renda Environmental removes material from both solids process trains and applies it to farmland, mostly within 35 to 50 miles of the treatment plant. The firm typically hauls about 36 truckloads per day, each with a 25-ton payload. The program operates year-round. Farmers pay \$10 per acre at the time they sign up. TRA's 2014 land application budget was \$4.7 million.

"We save the farmers a lot of money on fertilization," says Tatum. "They get a much better crop yield at a dramatically reduced cost. It's a very good program from an economical and agronomic standpoint. If you look at what farmers are charged throughout the U.S., I don't think you'll find many other programs as economical for them as ours." Renda handles all noticing for application sites (permitting is not required for Class A material) and maintains complete application records. Every August, the TRA submits a yearly summary to the Texas Commission on Environmental Quality. "It's a verification and certification of all the Class A material we produced," says Tatum. "We show where everything went. We have extensive records of our land applications, from cradle to grave."

BETTER THINGS AHEAD

TRA is now exploring thermal hydrolysis and digestion of biosolids at the Central Regional system, with the aim to reduce the volume of solids handled.

Tatum notes that thermal hydrolysis began in Europe about 20 years ago and has been steadily refined. During the process, primary and waste activated sludges at about 4 percent solids are blended in a holding tank under anaerobic conditions to achieve release of about one-third of the biological phosphorus.

Material emerging from that tank is pre-thickened with centrifuges or belt presses to 13 to 15 percent solids and transferred to a stainless-steel pulper/preheating vessel, from which it is fed at a metered rate into the thermal hydrolysis reactor.

"One of the systems we are considering has four reactors, each one holding 6 cubic meters of material," says Tatum. "The reactors are filled, topped off with steam and brought up to about 330 degrees F at 160 psi for 20 minutes. Each reactor then discharges into a flash tank."

When the material emerges from the bioreactor, the microorganisms' cell walls are ruptured (lysis). The resulting material is held in the flash tank for an interval, then cooled to about 110 degrees F and fed to anaerobic digesters. A portion of digester material is continuously recirculated to the hydrolysis process.

"In the end, you can get 60 to 65 percent volatile solids reduction, which is a major reduction," says Tatum. "You get methane gas, and you get an odorless Class A biosolids on which biological regrowth will not occur."

TRA expects to burn some of the digester methane (biogas) as fuel to heat the thermal hydrolysis process. "We still haven't determined what we will do with the remaining gas," Tatum says. "Combined heat and power may not be practical because our utility electric rates are very low, at about 4.8 cents per kilowatt-hour. We may look at using the methane to dry a portion of the biosolids. Taking the material from about 30 percent to more than 90 percent solids would reduce hauling costs significantly."

It's the kind of innovation that helps a biosolids program make the leap from good to great. **tpo**

featured products from:

Alfa Laval Ashbrook Simon-Hartley 866/253-2528 www.alfalaval.us

Andritz Separation, Inc. 800/433-5161 www.andritz.com/separation

Aqua-Aerobic Systems, Inc. 877/271-9694 www.aqua-aerobic.com

Bilfinger Water Technologies, Inc. 800/833-9473 www.water.bilfinger.com

RDP Technologies, Inc. 610/650-9900 www.rdptech.com

DEPENDABILITY DEPENDABILITY IN THE MIX SINCE 1960



@Rotamix

Vaughan's Rotamix System sets the standard for hydraulic mixing, providing the customer with lower operating and maintenance costs, more efficient breakdown of solids and Vaughan's UNMATCHED RELIABILITY. It's perfect for digesters, sludge storage tanks, equalization basins and other process or suspension type mixing applications.

- Over 1000 installations worldwide

- Optimizes solids contact with its unique "dual rotational zone" mixing pattern

- 10 Year Nozzle warranty

See videos, drawings, and details at ChopperPumps.com or call 888.249.CHOP







All-Out for Education



A FLORIDA WATER MANAGEMENT DISTRICT BRINGS AN EXTENSIVE ONLINE LIBRARY OF EDUCATIONAL MATERIALS TO TEACHERS, THE GENERAL PUBLIC AND OTHER AGENCIES

By Linda J. Edmondson

I lorida's focus on water resource management goes back to the early 1970s, when voters and lawmakers passed the Water Resources Act, creating water management districts to balance human needs for water with nature's needs, recognizing the state's fickle rainfall patterns.

Today, Florida is divided into five such districts to preserve and manage water resources. One of these, the St. Johns River Water Management District, is responsible for ground and surface water in all or part of 18 northeast and east-central counties.

As part of daily operations, the district sets rules for water use, conducts research, collects data, manages land, and restores and protects water above and below the ground, all while preserving natural areas. Like similar agencies around the country, it has a strong mandate to educate the public about water conservation.

ALTERNATE SOURCES

"We have about 110 local governments and 175 public water supply systems in our district," says Teresa H. Monson, public communications coor-



Students sign pledge cards promising to take care of their local watersheds.

dinator in the district's Office of Communications and Intergovernmental Affairs. "Our staff works closely with these partners to identify ways to extend groundwater supplies without causing environmental harm, and to help them identify alternative water sources, such as brackish water, reclaimed water, stormwater, surface water and even seawater in areas where they are hoping to desalinate."

The district also helps its utilities with water conservation education. With more than 665 million gallons of water a day delivered to

homes and businesses, the district knows one of the most important things it can do is educate about water conservation and so help provide for future growth and protect existing water users. ABOVE: Students create conservation messages on posters and bookmarks as part of the Water Conservation Challenge. RIGHT: A teacher works with a student on a lesson in the third-grade version of The Great Water Odyssey.

The St. Johns District may have one of the most extensive online water and water conservation education libraries. According to Monson, the district website has about 750 pages with numerous linked documents and multimedia mate-

rials for download, in addition to applications and databases, such as permitting or geographic information (maps, data) that the public can access. "A great newer online resource is our water-wise plant database, so when

people go to a plant nursery, they can look up plants by criteria such as size, type, color and flowering or nonflowering," Monson says. "Then, after finding the plant that meets their parameters, they can see what kind of growing conditions — particularly water — are needed for it to survive. This will be increasingly handy as we work to help utilities educate their customers."

PROMOTING SCIENCE

The district worked with educational professionals to create materials for Science, Technology, Engineering and Math (STEM), a national program designed to inspire, excite and prepare students for college majors and technical careers. Among the district's work in that area:

- Water Conservation Challenge enables students and teachers to extend water conservation learning to family and neighbors in a variety of creative ways.
- Science Fair Zone helps students find ideas on which to base school science fair projects.
- The Great Water Odyssey provides fun, interactive, Web-based educational programming about water resource protection and conservation.

The website has a dedicated section for teachers with resources for inclassroom and field use, including hands-on activities, sample lesson plans, professional development opportunities and more, all to facilitate making water part of the curriculum. Resources for students offer a variety of activities that include exploring the world of river otters, snook in the Indian River Lagoon, games and organisms that can indicate water quality.



Boost Your Productivity in Sludge Dewatering

Dehydr**is™** Twist Boosted Sludge Dewatering Using Piston Press Technology

- Combines plate filter press efficiency and centrifugal productivity
- Easy operation and high performance
- Achieve up to 40% dry content through an entirely automated process from mixed digested sludge
- Up to 30% reduction in sludge bulk compared to conventional dewatering

Visit us at WEFTEC | Booth 5528

INFILCO Infilco Degremont, Inc. – 8007 Discovery Drive, Richmond, Virginia 23229 • (800) 446-1150

www.degremont-technologies.com

A partnership with Bucher Unipektin

HEADWORKS | BIOLOGICAL | SEPARATIONS | MEMBRANES | OXIDATION DISINFECTION | BIOSOLIDS | INDUSTRIAL SYSTEMS



Students display conservation messages on posters they created as part of the Water Conservation Challenge.

"Last year we had about 511,000 visitors to our website and over a million page views — from people researching permits, to students doing school papers and teachers seeking teaching tools," says Monson. "We see spikes in Web traffic related to hot news topics, such as sink holes or algae blooms."

IN-HOUSE CREATIONS

The website is managed by the 16-person Communications and Intergovernmental Affairs office, and most of the creative development and exeLast year we had about 511,000 visitors to our website and over a million page views — from people researching permits, to students doing school papers and teachers seeking teaching tools.
 We see spikes in Web traffic related to hot news topics, such as sink holes or algae blooms."
 TERESA H. MONSON

cution is their responsibility. In addition to employing a photographer, graphic artist and webmaster, the staff handles media and public outreach, intergovernmental programs and policy analysis.

"Most of the information on the district website was created by staff to address an agency need or topic deemed important," Monson says. "In some cases, staff or the public may bring a topic on other websites to our attention, and we share that information through a link. Or we take a concept used elsewhere but customize it to be specific to the district, such as our online home water-use survey that residents can take to identify ways to conserve.

"We invite utilities and others to link to our site, but advise against copying materials because new posts are frequent and some materials are updated daily. Additionally some of the materials and photos are copyrighted. Although there are several publications and videos that we encourage others to download, some are based on Florida water-use numbers and wouldn't benefit those in other states. We welcome inquiries about permission to use certain materials."

The district's website is www.floridaswater.com, and Monson can be contacted at tmonson@sjrwmd.com. tpo

Dearémont

PITCHTIN RIGHTIN

WHETHER ON THE JOB WITH KENTUCKY AMERICAN WATER OR SUITING UP AS A VOLUNTEER FIREFIGHTER, DOUG BROOKS PUTS HEART AND SOUL INTO HIS WORK

DOUG BROOKS IS ALWAYS HELPING

others, whether that means helping with Kentucky American Water's annual Waterfest or the Kentucky River cleanup, or working as a volunteer firefighter.

His can-do attitude has served him well in his water treatment career: He is chief operator at the Kentucky River Station (KRS) II at Hardin's Landing treatment plant in Owenton and helps out at the Owenton Water Treatment Plant. His excellent work led Kevin Kruchinski, Kentucky American Water superintendent of production operations, to nominate him for the 2013 Meritorious Service Award from the AWWA Kentucky-Tennessee section.

"I didn't even know I had been nominated," says Brooks, who has 16 years' experience in the industry. "Someone came and interviewed me, but didn't say what it was for, so I thought it was just a plant tour. My boss, Dalvin Krug, sent me to the local conference and the next thing I knew, they were calling my name. I was flabbergasted."

In his nomination letter, Kruchinski highlighted Brooks' professionalism, his continuous drive for excellence and learning, his work with other operators to optimize operations, and his willingness to cross-train at other company water facilities.

The 20 mgd KRS II plant and the 1.0 mgd Owenton plant serve about 500,000 people in parts of 10 counties, including the cities of Lexington and Owenton. "When you walk into a plant, you never know what's going to happen," says Brooks. "Some days it's routine and other days it's something every hour. We have to be on our toes and know what to look for."

MOVING UP

Brooks began his career in the Public Works Department in Cynthiana, Ky., as a maintenance worker. "I worked in the recreation department tak-

STORY: Trude Witham PHOTOGRAPHY: Shaun Ring



Doug Brooks, chief operator at the Kentucky American Water treatment facility in Owenton.

ing care of the grounds and, before that, as an umpire for the softball and baseball teams," he says. "A friend in the department asked me if I'd be interested in working for the utility."

He eventually switched to meter reading and earned his Class II distribution license. Two years later, he became an operator trainee, received his Class IV water treatment operator certification, and became a full-fledged operator: "I've always been the type of person who wants to better myself, and I saw an opportunity in water treatment."

He credits his mentors for helping him succeed. "My supervisor, Nick Dotson, encouraged me, showed me what I needed to do, and had my back," says Brooks. "Co-workers Jim Sapp and Gene Fuller also mentored me." Brooks moved to Kentucky American Water in 2008 and was operator at the Richmond Road Station plant in Lexington before moving to KRS II a year later.

As chief operator, he helps supervise operators and maintenance workers at the two water plants and the Owenton Wastewater Treatment Plant, handles scheduling, trains operators, analyzes plant process samples, performs compliance sampling, orders chemicals, calibrates chemical feed systems, standardizes laboratory equipment and documents

operational data. His team members at KRS II are:

- Class IV operators Bill Allen (three years), Terry Kincaid (nine years), Nick Dotson (one year), Christine Florence (two years), Larry Hedge (three years) and Bobby O'Banion (nine years)
- Class III operator David Clifton (nine years)

KRS II is staffed around the clock, and Brooks is on call around the clock for all three plants. He describes himself as a laid-back manager who likes to have fun: "I feel that I am the kind of leader people trust and feel com-



Brooks, shown with Terry Kincaid, operator. Brooks won Kentucky American Water's Warren Rogers Community Leadership Award for exemplary professional performance and outstanding community service.

When you work as a team, you don't have as many headaches, since you're all helping each other. A lot of people are depending on us to keep them healthy, so we can't do our job just halfway."



POSITION: Chief operator	
EXPERIENCE: 16 years	
CERTIFICATION: Class IV water treatment, Class II distribution, laboratory analyst	
AWARDS: 2013 Meritorious Service Award, AWWA Kentucky-Tennessee section	
GOALS: Keep making the best-quality water; volunteering as a firefighter	
GPS COORDINATES: Latitude: 38°21'30.35" N; Longitude: 84°51'54.01" W	

Brooks supervises operators and maintenance workers at two water plants. He saw a career in water treatment as an opportunity to better himself. He's shown in the high-service pump gallery with operators Larry Hedge (center) and Terry Kincaid.





Plant operators may say they "put out fires," but Doug Brooks sometimes does so literally: He spends up to 20 hours a week as a volunteer firefighter, and volunteers as an emergency medical technician and search-and-rescue team member.

Brooks has been a Kentucky-certified firefighter since 2000, and he'd like to spend more time in that role. "I've been too busy lately at the treatment plant to do as much volunteering as I'd like," he says. "It is demanding, though, and those who do it deserve the utmost respect."

When called to a fire, Brooks is lucky to get four hours' sleep. He decided to train as a firefighter at his wife's suggestion. "I actually wanted to become a police officer, but my wife didn't like that idea," he says. "But she knows I always like helping people, so she said, 'Why don't you try firefighting?'"

He trained for about 150 hours spread over a year, in the field and classroom, before getting his certification. "I spend about 20 training hours just to maintain my certification," he says. "Volunteer firefighters are constantly training." He has fought more fires than he can count.

That, and working full time at the Kentucky River Station II plant, keeping the water safe for some 500,000 residents, means a lot of responsibility. Brooks is undaunted. "The key to firefighting is God and communication," he says. "If you have both of those, it will ensure success in all you do."

ABOVE: Brooks (with Larry Hedge) strives to learn constantly and encourages his team to follow suit. BELOW: The team at the Owenton facility includes, front row, from left, Terry Kincaid, operator; Dorothy Johnson, water quality specialist; and Tony Hristev, computer technician; back row, Larry Hedge, operator; Doug Brooks, chief operator; and Dalvin Krug, operations supervisor.



fortable coming to and asking questions. I believe in one-on-one interaction. I always try to treat others the way I want to be treated."

Brooks and his operators enjoy the challenges each day brings. "We're still learning every day," he says. "If you're not always learning in this job, then you must be a hermit."

MEETING CHALLENGES

Located on the Kentucky River, the KRS II plant was built in 2010 to help the company meet growing demand. The plant helped mitigate a drought in Lexington during summer 2012. "We sent 10 to 12 mgd more water to Lexington so they wouldn't have to implement water restrictions," Brooks recalls. "We just had to step up our game a little to meet the demand."

Besides droughts, Brooks has had to deal with manganese caused by high organics in the source water. "If the manganese gets into the filters, it can cause turbidity problems in the finished water," he says. "That is one thing

we constantly look for, and when it happens, the whole team gets together to discuss and figure out how to solve this issue." If team members detect manganese

When you walk into a plant, you never know what's going to happen. Some days it's routine and other days it's something every hour. We have to be on our toes and know what to look for." DOUG BROOKS

in the water, they add more chlorine, and if they detect manganese in the filters, they add sodium permanganate or carbon.

While floods have not caused major problems, they can affect the turbidity and infiltrate the intake buildings that house the raw-water pumps. "If water reaches these buildings, it can cause a lot of problems, so we try and divert the water by placing sandbags around the buildings," Brooks says.

OUTSTANDING WATER

Brooks' biggest challenge is "making the best water at the best price." He has found ways to lower costs with the everyday choices — for example, by constantly monitoring the water and feeding the right amount of chemicals. "The water quality is outstanding," he says. "We always strive to do 10 times better than what is required. You can't get everything out of the water, and sometimes you don't know if you have taste or odor issues. If you discover that you do, you have to tweak the process by adding more permanganate or even carbon."

It helps that KRS II is only 4 years old. Designed by consulting engineering firm Gannett Fleming of Harrisburg, Pa., the plant uses a dual-media filtration system (Roberts Water Technologies, division of The Roberts Filter Group) and a chemical treatment process designed by Gannett Fleming. It is designed for expansion from its current 20 mgd to 30 mgd.

In the Kentucky River, three submerged intake screens pipe water to a raw water sump installed through jet grouting to a depth of 80 feet. The jet grouting allows the surrounding weak soil to support the sump excavation. Raw water is pumped over a steep river bluff through an elevated 42-inch pipeline to the treatment plant. Finished water is piped through a 31-mile main to Lexington. The plant's innovative design earned Gannett Fleming and Kentucky American Water a 2013 Grand Honor Award from the American Council of Engineering Companies of Kentucky.

Other plant equipment includes Stage 1 flocculator drives (Jim Myers & Sons), rapid mixing equipment (Philadelphia Mixing Solutions), progressive cavity pumps (NETZSCH Pumps North America), chemical feed pumps (Lutz-JESCO America), Floway vertical turbine pumps (Weir Minerals) powered by U.S. Motors (Nidec Motor Corporation) and motor controls (Eaton Corp.)

HELPING OUT

Brooks assists with company functions like Waterfest, a family-friendly



Your challenge: Reducing costs while treatment demand continues to increase. Now you can lower your energy consumption for WWTP aeration and gain process efficiencies with a choice of three blower technologies: Positive Displacement Blower | Hybrid Blower | Turbo Blower **This Is Performance³**.

Up to 80% of the energy consumption in WWTP is used in the aeration process. With Aerzen Blowers you can realize efficiency improvements and air flow optimization to meet highly fluctuating demand. By selecting a Hybrid Blower you can manage the base load and match the demand spikes with a Turbo Blower.

This is Performance³.



AERZEN EXPECT PERFORMANCE

Aerzen has 150 years of success manufacturing reliable, quality blower equipment.

Let the Aeration specialists at Aerzen guide you to the right technology for your WWTP application.

Call 610-380-0244 or email aerzen@aerzenusa.com to achieve Performance 3.

See Performance 3 in action at www.aerzenusa.com



When the water rises -

KSB won't leave you stranded

Major flooding can have a severe impact on people's lives and the environment. Factors such as rapid climate change have actually led to an increase in serious floods. In KSB's portfolio of flood protection solutions, we can provide our customers with wet AND dry-installed pumps. Whether a standard solution or engineered project need, KSB offers comprehensive consulting, model testing and computational analyses to meet our customer needs. To learn more about our flood control solutions come visit us at WEFTEC Booth #4761.

www.ksbusa.com

> Our technology. Your success. Pumps • Valves • Service



The entire team at the Owenton plant works on resolving issues related to high organics in source water. (AutoCAT 9000 chlorine amperometric titrator from Hach.)

We're still learning every day. If you're not always learning in this job, then you must be a hermit."

community event held in the summer at the Richmond Road water plant. Visitors learn how water is



taken from the Kentucky River, treated and delivered through the distribution system. He also volunteers for River Sweep, held the third Saturday in June to clean litter and trash from the river.

His eagerness to help is one reason he received the Meritorious Service Award. Others include no regulatory violations, keeping basins and equip-

ment clean and in proper working order, helping and training operators, helping to fix system leaks and replace lines, and helping with community and school events.

The first year he joined Kentucky American Water, Brooks won the company's Warren Rogers Community Leadership Award for exemplary professional performance and outstanding community service. "The company gives this award to just one employee a year," says Brooks. "It's an honor to receive it."

He recently completed the Kentucky Rural Water Association's Utility Management Institute certification program: "It's designed to recognize and market the skills of experienced management personnel, and it also provides a career incentive for those who seek opportunities in utility management."

Brooks used to play basketball, baseball and softball. He still enjoys hunting, fishing and camping, and spending time with family and friends. His goal is to continue working with his team to make quality water. "When you work as a team, you don't have as many headaches, since you're all helping each other," he says. "A lot of people are depending on us to keep them healthy, so we can't do our job just halfway."

His advice to other operators mirrors his own philosophy: "Be true to yourself, be true to the company and be true to the team." **tpo**

featured products from:

Eaton 877/386-2273 www.eaton.com

Gannett Fleming 800/233-1055 www.gannettfleming.com

Hach Company 800/227-4224 www.hach.com (See ad page 2)

Jim Myers & Sons, Inc. 704/554-8397 www.myersequipment.com

Lutz-JESCO America Corp. 800/554-2762 www.jescoamerica.com (See ad page 77)

NETZSCH Pumps North America, LLC 610/363-8010 www.netzschusa.com (See ad page 29)

Nidec Motor Corporation 888/637-7333 www.usmotors.com

Philadelphia Mixing Solutions 800/956-4937 www.philamixers.com

The Roberts Filter Group 610/583-3131 www.robertsfiltergroup.com

Weir Minerals 559/442-4000 www.weirminerals.com



Keller America submersible level transmitters provide the best price, performance, and value for your application.

Each one is built to order in the U.S. with a short, 3-day lead time and several models include guaranteed lightning protection at no additional cost.

For information on the best Keller submersible product for your application, contact Keller today. Wefter 2014 Booth 7109

your application, contact Keller today. Booth 7109

For information on the best Keller submersible product for

protection at no additional cost

ead time and several models include guaranteed lightning

WWW.KELLERAMERICA.COM

(cculeve

-13

J

877-253-5537 SALES @ KELLERAMERICA.COM

Process Protection

A SPECIALLY DESIGNED RECEIVING STATION ENABLES AN ILLINOIS VILLAGE TO RECEIVE SEPTAGE AS A SOURCE OF REVENUE WITHOUT CREATING TREATMENT PLANT PROCESS ISSUES

By Ted J. Rulseh

n 2005, the Illinois village of Richmond built a \$7 million wastewater treatment plant to support anticipated growth, including a 396-home subdivision.

The subdivision was never built, and its expected revenue never came — yet the plant went online as scheduled, and loan payments were due. The village searched for a new revenue stream to replace the connection fees and ongoing water and sewer charges from the failed subdivision project.

In 2011, the treatment plant turned to receiving septage, but that caused a variety of operations and process issues. Two years later, plant team members found a solution in a new septage receiving and treatment station. Today, the process functions smoothly, and revenue from septage treatment helps sustain plant maintenance and protect the village's investment in the treatment facility — now needed for a new surge of growth.

STRESS ON THE HEADWORKS

Richmond, in northeastern Illinois just south of the Wisconsin border, was incorporated in 1872 and is home to about 1,900. It is mainly residential

with some light industry. Although the downturn in housing starts after 2008 temporarily slowed growth, the village expects its population to grow to as many as 15,000 by 2030.

When the new treatment plant began receiving

septage, problems were not long in coming. It brought a heavy organic solids load, plus debris including rocks. Haulers were discharging septage directly into a manhole just upstream from the plant headworks screen, which was not designed or sized for the material. Soon the screen basket was out for rebuild. Solids were accumulating in the influent channel, in the oxidation ditch and on the aerators, and were clogging pumps. The Beast septage receiving system (Enviro-Care) at Richmond includes a screen, hauler station, and hauler access panel.

Everything the manufacturer told us it would do, it has done."

Treatment capacity was not the issue — the new Richmond plant was permitted to accept 10,000 gpd of septage and was designed for expansion. The question was whether the village could continue to receive septage and the attendant revenue — and take in more of it. That depended on finding a method of pretreating septage before the headworks, thus avoiding excessive maintenance costs and protecting plant equipment life.



TURNING TO TECHNOLOGY

Richmond plant team members were familiar with the Beast, a septage receiving station manufactured by Enviro-Care near Rockford, about an hour west. The unit, recently introduced, does not require a rock trap or grinders. It is designed to screen heavy solids and remove them rapidly. Enviro-Care agreed to let Richmond use the equipment on a 90-day trial, with the option to purchase it thereafter.

A concrete pad was poured for the unit next to the headworks building, and temporary wiring and water *(continued)*



Looking for a Better Wastewater Treatment Mixer?

Choose the Chemineer[™] Model 20 Agitator with RL-3 Ragless Impeller

The combination of the high-efficiency gearbox of the Model 20 mixer with the unique characteristics of the RL-3 ragless impeller eliminate downtime and maintenance costs, increase performance and extend the service life of the agitator.

- · Ideal for anoxic mixing, sludge treatment and storage, digesters and many other applications
- · Modular design requires fewer replacement parts for additional cost savings
- · High axial flow for superior mixing performance
- · Reversible rotation to meet a wide range of process requirements

For additional information, visit www.chemineer.com/model20. For sales call: 1-800-643-0641 or go to www.chemineer.com/sales.



www.chemineer.com

NETZSCH TORNADO[®] T2 Rotary Lobe Pump New Metal Lobe/Rubber Liner Design!

- Ground-breaking timing/drive design
- Full service-in-place
- Replaceable liner
- Lowest life cycle cost
- Cartridge seal technology
- Exceptional performance
- Superior durability
- Compact and robust
- Low pulsation

Booth 4517 at WEFTEC in New Orleans, Sept. 29 - Oct. 1, 2014

NETZSCH

weftec 201

Booth 3118

NETZSCH Pumps North America, LLC Tel: 610-363-8010 email: TORNADO@netzsch.com www.netzschusa.com/T2



After the driver enters a hauler ID and the type of waste, a knife valve in the hauler station opens and the driver can begin discharging from the truck.

connections were installed. The device operated Monday through Thursday; within two weeks of startup it was generating on average 3 cubic yards of screenings over those four-day runs.

The receiving unit Richmond tested was part of an integrated system. The Beast unit, with its heavy-duty, dual-drive drum screen in a specially designed tank, was connected to a hauler station with a knife valve and flowmeter. A hauler access panel and Flo-Logic software for data logging, security and billing completed the system. While delivery data was monitored in the treatment plant office, billing information was sent via Wi-Fi to the village hall for invoicing.

SUCCESSFUL TRIAL

Well before the end of the 90-day trial, the village board took the advice

of treatment plant personnel and voted to purchase the receiving system. The final step was to prepare a permanent location for the unit at the plant.

Bill Price, Richmond Public Works supervisor, says that in several months of operation the unit has successfully removed paper, rags, plastics and other materials from the waste stream and protected downstream processes. "Every-thing the manufacturer told us it would do, it has done," he says.

"The materials are removed and placed in a 3-cubic-yard dump container. Odors from the process are nearly nonexistent. There's a cover on the container, which we change out about every week to week and a half, depending on how many haulers come in."

In winter when cold weather causes the unit to freeze up, haulers revert to emptying into the manhole, but traffic during that season drops substantially, from multiple trucks per day to perhaps one truck every third day. "We can tolerate that," Price says. "And if we were to put up a structure around the machine, we could run it year-round. We haven't ruled that out.

"The Flo-Logic software is very nice. I can see what one truck off-loads. It keeps a tally of how much we've had that day, that month and that year. The software is very easy to work with. Programming a new user into the system is a matter of a few keystrokes. All in all, it's a very effective system." **tpo**



Talk with us.

www.twitter.com/TPOmag

Grit Removal at its Finest...™

Fine Grit Matters. Left unchecked at the headworks, grit wears equipment and deposits throughout the plant, increasing maintenance and energy costs. Variations in size, shape & specific gravity all influence grit's settling velocity and allow it to enter the plant causing damaging impact on downstream processes.

At Hydro, we understand grit. That's why we guarantee 95% removal of <u>all</u> grit 75 microns and larger. Through best industry performance, our solutions deliver clean, dry grit with low odors, reduced operating costs and in a small footprint design.

weftec

Visit booth 2317 at WEFTEC 2014 to see Hydro's wastewater and stormwater treatment solutions



www.hydro-int.com



TAKE CONTROL OF YOUR LIFT STATION.

WITH THE NEW INTEGRINEX[™] CONTROL SYSTEM SERIES, THE WAY YOUR LIFT STATION OPERATES IS ENTIRELY UP TO YOU.



TOTAL CONTROL MEETS TOTAL RELIABILITY



ANNOUNCING THE NEW RELIASOURCE® 8X9 ABOVE GROUND LIFT STATION

The latest ReliaSource lift station is now available with the Integrinex[™] control system of your choice. This 8x9 above ground station packs all the advantages of the ReliaSource brand into a compact, budget-friendly option:

- 100% designed, manufactured, and tested by Gorman-Rupp
- Decades of trouble-free performance for the industry's lowest lifecycle costs
- · Unparalleled parts availability
- Industry-leading 60-month warranty

RELIAJOURCE

You know best what it takes to optimize your lift station's performance. And now you can get exactly the level of control you need. The Integrinex control system series from Gorman-Rupp offers four powerful models with a range of control, monitoring, and management features to suit your requirements. So you can choose the controls that are right for you.

Integrinex[™] Basic- The affordable choice for simple and reliable plug and play performance.

Integrinex[™] Standard- Packed with the features you need most, including duplex and triplex alternation, level sensors, pump delay and alarms.



THE GORMAN-RUPP COMPANY, MANSFIELD DIVISION P.O. BOX 1217 MANSFIELD, OHIO 44901-1217 USA 419.755.1011 GRSALES@GORMANRUPP.COM GRPUMPS.COM Integrinex[™] Advanced- Custom engineered to your unique system requirements for the additional control you need.

Integrinex[™] Remote View- All the functionality of our advanced system with the added convenience of remote tablet-based management and monitoring.



Sediment being removed from a potable water storage tank.



As the World Warms

WILL HOTTER SUMMERS FROM CLIMATE CHANGE CREATE A HEALTHY ENVIRONMENT FOR UNHEALTHFUL ORGANISMS IN SEDIMENT AT THE BOTTOM OF WATER TANKS AND TOWERS?

By Ron Perrin

For more than 20 years I have performed video inspections of water tanks and towers, gaining a unique perspective on water storage infrastructure in states from Arizona to Florida. For the most part, I see little concern over the sediment on the floors of most tanks.

In 2013, my company inspected more than 500 water storage facilities, 80 to 90 percent of which needed cleaning. Only 64 chose to have us remove the sediment. I inspect many of these utilities annually, and in many cases my recommendation is always the same: "Your tanks need to be cleaned."

Sediment slowly builds up in most water tanks, and that may be a growing public health threat. Record high temperatures from climate change create a warmer environment that may leave tanks at greater risk of chlorine depletion from the growth of microorganisms — including pathogens.

The U.S. EPA has no rules requiring potable water storage tanks to be cleaned — just a recommendation to clean "as needed." Similarly, the American Water Works Association recommends cleaning every three to five years, or "as needed." That leaves ample room for interpretation, so utility managers are not motivated to include tank cleaning in maintenance budgets. Few states require scheduled cleaning, and many don't even require regular inspection. But what are the potential consequences of failure to clean?

A CASE IN POINT

In August 2013, the death of a 4-year-old boy near Violet, La., was linked to the *Naegleria fowleri* amoeba. The child had been playing on a backyard slide that used water from the St. Bernard Parish water system, later found to be contaminated with the amoeba. At the time, NBC News reported:

"Naegleria fowleri infects people when water containing the amoeba enters the body through the nose. This typically occurs when people go swimming or diving in warm freshwater places, like lakes and rivers. The Naegleria fowleri amoeba then travels up the nose to the brain, where it destroys the brain tissue."

After the boy's death, the Louisiana Department of Health and Hospitals (DHH) asked the U.S. Centers for Disease Control and Prevention (CDC) for help since the department could not find a lab to test for the amoeba. The CDC usually does not test drinking water but did in this case because of two



A commercial diver enters a potable water tank on line air.

deaths related to the amoeba that occurred in Louisiana in 2011. CDC also tested DeSoto Parish Waterworks District No. 1 because it was near the site of one of the 2011 deaths.

The CDC confirmed the presence of the rare amoeba in five locations in the district's water system. Now that this amoeba has been found in a public water system, will more stringent regulations be forthcoming?

One reason *Naegleria fowleri* has not been found in other U.S. water systems is that tests for it (and many other bacteria, protozoa and viruses) are not routinely performed. The amoeba has been found only in the south half of the country, where high temperatures enable it to become active. With climate change, it may not be long before it is seen in the north, as well.

Since utilities cannot test for every known contaminant, much less those not yet found in water tanks, a coliform test is used to determine whether other fecal pathogens are likely to be present. The new Revised Total Coliform Rule (RTCR) requires assessment and corrective action when there are indications of coliform contamination. The RTCR no longer includes a monthly maximum contaminant level violation for multiple total coliform detections. Instead, systems that have indicators of coliform contamination in the distribution system must assess the problem and take corrective action.

AGING TANKS AND CLIMATE CHANGE

As the national water infrastructure grows larger, it is also getting older. Some modern-looking welded steel water towers have been standing for more than 50 years, while others built in the 1920s and 1930s give their age away with their steeple roofs and riveted legs and sidewalls.

In response to the Great Depression in 1933, President Franklin Roosevelt enacted the New Deal programs, including the Works Progress Administration, which was involved in the construction of 3,026 water storage facilities and the reconstruction or improvement of another 738. Many of those facilities are still in service today.

While there is nothing wrong with older facilities that are well-maintained, many tanks and towers rarely, if ever, have had their interiors cleaned.

My crews often meet water utility workers who have been on the job for five years or more and have never seen a tank cleaned.

Meanwhile, summers are longer and record high temperatures increasingly common. That combination can make soft sediment in tanks into breeding grounds for bacteria, protozoa and viruses and allow them to get a foothold. Ideal conditions occurring more regularly can enable these organisms to bloom out on a record hot day, overtaking chlorine and other disinfectants and spreading through the distribution system.

With more aging water storage facilities holding warmer water, conditions are perfect for triggering growth of more dangerous contaminants than have ever been reported. The *Naegleria fowleri* amoeba may have been our first warning.

CURRENT TESTING: IS IT ENOUGH?

While pathogens increase in strength and number under the safety of a blanket of sediment, testing at the tap may not reveal a problem. The warmest part of the summer, perhaps on a record hot day, is when a standard test may find that chlorine seems to have been suddenly depleted and the entire system is now at risk. In reality, the problem has been festering under the sediment undetected, for months or in some cases years.

In Texas, assessment of sediment on tank floors is required as a part of an annual tank inspection report. Be sure that your inspection includes the interior tank floor. Do not let it go year after year. If you have an accumulation of sediment, don't think of it as "just a little dirt." Know that it is a broken barrier that can allow contaminants to compromise your entire water supply and the health of your customers.

One way to avoid that scenario is to take water samples from the tank floors. If you have sediment with significantly less chlorine residual, act immediately by cleaning the tank and removing the sediment. If you find significantly less chlorine residual at or near the tank floor but no sedimentation problem, you should consider a mixing solution.

HOUSEKEEPING PAYS

In many cases, the most important and effective action a water utility can take is basic housekeeping. If you see extensive sediment, or you know the facility has not been cleaned in the past five years, it is likely that the sediment needs to be removed.

Every water tank should be on a schedule to be cleaned at least once every five years, and perhaps more often if you have an RTCR violation. Once you remove the sediment, you will discover that chlorine costs are reduced because the chlorine is no longer at war with the microbes growing on the floor.

You have many choices when it comes to cleaning water storage tanks and towers. These include a well-qualified potable water diving contractor, who can remove all loose sediment with minimal water loss and minimal disruption in service. For tips on doing your own tank or tower inspection, visit www.watertankinspection.co.

ABOUT THE AUTHOR

Ron Perrin is the owner of Ron Perrin Water Technologies, a company that inspects and cleans potable water storage tanks and towers. He can be reached at 888/481-1768 or ronlooks@aol.com. tpo

Attention Treatment Plant Operators

Let us pump your sludge. Then you be the judge.

Put our pump to the test. There's no cost to you. Take the PVP Challenge and prove it to yourself.

We are so confident in our pumps' ability to reduce your overall maintenance and labor costs that we will let you take one for a test drive... for FREE. You provide the application and we'll provide the unit. It's that simple! PVP Double Disc[®], Positive Displacement pumps feature:

- Seal-less, gland-less, oil-less design for zero routine maintenance.
- Will run dry indefinitely without damaging the pump.
- Passes solids up to 2 inches in diameter and full-line semi-solids.
- Fewer moving parts means less need for repairs or maintenance.
- Patented Maintain-in-Place design reduces downtime and lowers maintenance costs.

Toll Free: 800-311-3311 PennValleyPump.com



Step 2-Discharge Cycle



weftec 2014

Booth 2229

Swap Your Pump

Install one of our pumps and put it to the test. There's no cost to you. PVP Double Disc®, Positive Displacement Pumps are designed to handle the toughest sludge challenges.

STIL A TEACHER

KAM REEVES APPLIES EDUCATION, COACHING AND LEAD-BY-EXAMPLE PRINCIPLES TO HIS SUPERINTENDENT'S JOB AT THE OTTUMWA WATER POLLUTION CONTROL FACILITY

KAM REEVES IS PROOF THAT YOU

can start over — even when you think you're too old — and build an award-winning wastewater career.

Now in his 19th year at the Ottumwa (Iowa) Water Pollution Control Facility, Reeves has parlayed a career as a high school teacher and a passion for instruction into a leadership position that has earned him the respect of his boss, his team members and his community.

In August 2013 Reeves' dedication to wastewater treatment earned him the William D. Hatfield Award from the Water Environment Federation and the Iowa Water Environment Association, a careercrowning achievement that recognizes outstanding performance and professionalism. Reeves also won the city's Outstanding Employee of the Year Award in 2006.

In each case, he downplayed his role in keeping the plant running in top form and gave credit to his team. "I'm humbled and proud to have won these awards," says Reeves, who looks more like a university professor than a wastewater executive. "As far as I'm concerned, they represent a complete team effort and go to all of us at the plant. We all work together and rely on everyone's expertise, from the supervisors to the operators to the lab and maintenance crews." STORY: Jack Powell PHOTOGRAPHY: Mark Hirsch



Kam Reeves, superintendent at the Ottumwa Water Pollution Control Facility, in the headworks grit building (grit pump by Gorman-Rupp Co.).

Reeves feels grateful to the city for hiring him "in middle age." He brought with him an upbeat personality and a wealth of teaching experience. After earning a bachelor's degree in education in 1979 from Wayne State College in Wayne, Neb., he taught physical education and driver education for 10 years for the Ottumwa Community School District.

When he couldn't find a full-time position in his specialties he went to work for the U.S. Postal Service as a letter carrier and then for the Iowa Department of Transportation as an inspector for new highway construction, running all the tests in the soil lab. Then he heard about an opening at the water pollution control facility and thought it would be a good opportunity.

"If you asked me even a couple of years before I came here, I probably would have said I didn't have the inclination or desire," Reeves admits. "Heck, I didn't even know where the plant was located." That changed when he joined the facility as an operator in 1996.

Three years later, just after Reeves attained his Grade 3 wastewater operator license, his foreman left. Seeing an opportunity to advance, he applied for the job, which was upgraded to operations supervisor, and got it. Today, Reeves has a Grade 4 license

(highest) and has been plant superintendent since long-time mentor Robert Bruett retired from that role in 2013.

GRATEFUL FOR OPPORTUNITY

Reeves grew up and graduated from high school in Ottumwa, a southeast Iowa city of 25,000 that calls itself the City of Bridges. Its amenities include the most park space per capita in the state, the \$24 million Bridge View Center convention hall and theater, and some excellent eagle watching anywhere at a hydro dam on the Des Moines River.

TRANSITION HAS WORKED WELL

As superintendent, Reeves supervises a staff of 14; reports directly to Joe Helfenberger, city administrator; and works closely with other city departments. Reeves' team includes:

• Doyle Moore, operations supervisor; and Shawn Shepard, Steve Graham,

ABOVE: Kam Reeves (left) discusses operational procedures with Doyle Moore, operations supervisor, while inspecting a vertical loop reactor at the plant (Evoqua Water Technologies). RIGHT: Reeves uses a Sludge Judge (Nasco) to check the sludge blanket in the final clarifier.

Kam has done an excellent job of building morale. We have a number of long-term people with a ton of experience who continue to work here because of Kam's efforts to keep morale high." JOE HELFENBERGER

Kam Reeves, Ottumwa (lowa) Water Pollution Control Facility

POSITION: | Plant superintendent

EXPERIENCE: | 18 years

CERTIFICATIONS: | Grade 4 Wastewater Operator

EDUCATION: | Bachelor's degree, education, Wayne State College, Nebraska MEMBERSHIPS: | Iowa Water Environment Association,

Water Environment Federation

GOALS: | Continue serving residents of Ottumwa to the best of his ability GPS COORDINATES: | Latitude: 41°00'12.27" N; longitude: 92°23'05.68" W





Ottumwa Water Pollution Control Facility employees say Kam Reeves is fair with everyone. Maybe that's because he was a sports official for 37 years.

"I began umpiring baseball games when I was 15," says Reeves. "I started at Pee Wee League and moved up to Little League, and then to Babe Ruth League. I also umpired high school and college games."

Reeves liked officiating so much that in 1977 he went to the Bill Kinnamon Umpire School in St. Petersburg, Fla., with dreams of becoming a Major League Baseball umpire. While that didn't pan out, umpiring did allow him to "meet a lot of nice people in different communities, some of whom have become good friends."

Baseball isn't Reeves' only sport: He refereed high school and college football and basketball for about 25 years. Though he has been away from officiating for the past four years, he admits missing the games and may get back into it. "Sports officiating is great training for managing people," he says. "You have to be alert, make decisions on the spot and above all, treat everybody the same. That formula works well when you're in charge of a staff and have a bunch of projects to get done."

Josh Watson, Frank Stanton, Jason Guyette and Brandon Coffman, operators

- Patricia Davis, lab supervisor, and Julaine Olson, lab technician
- Jesse Merrill, maintenance supervisor, and Tom Rea, maintenance technician

The Ottumwa Water Pollution Control Facility staff includes, front row, from left, Jason Guyette, Julaine Olson, Patricia Davis and Michael Schafer. Back row, Doyle Moore, Tom Rea, Josh Watson, Jesse Merrill, Brandon Coffman, Kam Reeves and Rachel Jones.

- Steve Cullinan, industrial pretreatment coordinator
- Michael Schafer, clerk

They all get the full Reeves treatment: instruction, cheerleading, mentoring and more. "It's been a great 18 years, and I'm glad I made the transition to the wastewater plant," says Reeves. "When I started with the city I was 41 and thought I was too old, so I was very happy to get hired. I think I'm pretty faithful and have done a good job."

Helfenberger praises Reeves for his "focus on having a well-running operation that has never had a process violation," and for his commitment to the facility staff.

"Kam has done an excellent job of building morale," says Helfenberger. "We have a number of long-term people with a ton of experience who continue to work here because of Kam's efforts to keep morale high. Good morale is the difference between gaining a little extra productivity or not."

FACILITY UPGRADES

Reeves demonstrated a strong work ethic right from the start, as the facility in 1996 was in the second phase of a major construction project transforming it from a trickling filter plant to a 6 mgd activated sludge unit with a 12.5 mgd design flow. Over the years, he has been involved in several large capital improvement projects, including the 1998 installation of four Envirex vertical loop reactors (Evoqua Water Technologies) — one tank with four separate cells — for biological nutrient removal.
Besides those units, Reeves and the operators are responsible for the plant's preliminary and primary treatment, clarification, filtration, anaerobic digesters and biosolids conditioning tanks. Biosolids are land-applied by a contract hauler. Team members ensure that the material meets all EPA regulations. Plant effluent discharges to the 525-mile-long Des Moines River.

The plant team members also maintain 31 lift stations, 10 of which are for stormwater, and monitor and sample 11 combined sewer overflows, which the city is working to reduce through a 25-year sewer separation project aimed at eliminating backups in basements and sewage overflows.

It's one of \$35 million in capital improvement projects the city is undertaking. Others include revitalizing the downtown, renovating the Market Street Bridge in the heart of downtown and sprucing up Main Street in a major revitalization of the city center.

A major treatment plant upgrade, installing a UV disinfection system,

has been delayed for a year because of budget constraints. That means the plant staff will start work on the project in July 2015, aiming to bring the plant in compliance with its new NPDES permit limit for *E. coli* by October 2016.

COMMUNICATION IS KEY

"In early 2014 we finished a project where we replaced about 275 feet of force main that ran underneath a four-lane highway," says Reeves. "We had a couple of leaks in a one-week period in September 2013, so we knew that area of ductile iron pipe would

Kam is a great guy to work with. He comes from being a school teacher and carries a lot of those traits with him on the job. Not only does he like to teach and keep people informed about changes in regulations and budgets, but he's also 110 percent committed to everything he takes on."

have to be replaced. HR Green, a local engineering firm, helped us get the piping in place and inspect the line with a TV camera. It was a pretty big job, and we were glad to get it done before there was a leak under the four-lane that would have disrupted traffic."

As with all projects, Reeves maintains constant communication with the operators. He sees open lines of contact with supervisors and staff as vital to good leadership. The day-shift staff and Reeves start at 7 a.m. and work until 3:30 p.m.; operators on 3 to 11 p.m. and 11 p.m. to 7 a.m. shifts ensure 24/7 coverage.

On Monday mornings, Reeves meets with his supervisors to discuss projects the plant and other city departments have going on during that week. He also touches base with operators to talk about projects, so that if they're checking pump stations around town, they'll know about bridge closures or access problems and specific things they may need to be aware of at pump stations. The goal is "to figure out the best solutions that will work, that are the most feasible within our tight budget, and those that are best for the residents we serve." Those sentiments aren't lost on his operators.

EMPLOYEES GRATEFUL

"Kam is a great guy to work with," says Shepard, a swing-shift operator and 23-year plant veteran. "He comes from being a school teacher and carries a lot of those traits with him on the job. Not only does he like to teach and keep people informed about changes in regulations and budgets, but he's also 110 percent committed to everything he takes on. I think that's why he gets so much respect from his people."

Shepard, a Grade 2 operator who worked as a wastewater operator for a local company before joining the Ottumwa plant, appreciates Reeves' inclusive management style and his willingness to "jump in with you to help out,"

Lapeyre Stair... We don't miss a step.

Lapeyre Stair serves all your stair needs quickly and precisely. In-house detailing and design ensure project accuracy – every time, on time.

Choose from our expanding product line to meet your on-site assembly requirements.



• Welded Egress Stairs • Alternating Tread Stairs • Platform Systems • Bolt-together Stairs

Accurate and timely advanced stair building technology since 1981.

Send us your plans or email us at **Is.sales@lapeyrestair.com** to learn how you can experience the ease of working with long-time stair building professionals. Or, to immediately consult a knowledgeable customer service agent, call **800-535-7631**.





GET A RETURN ON YOUR INVESTMENT!

Biowater's fixed film processes increase treatment capacity while reducing footprint and overall energy costs.



Our CFIC[®] process offers additional benefits over traditional systems, even other fixed film processes, including solids capture, energy savings, and even greater footprint savings. CFIC[®] effluent may be suitable for discharge or tertiary filtration and subsequent reuse.



Primary treatment OFICE blefilm reactors

e: sales@biowatertechnology.com p: 401-305-3622 | f: 401-305-3677 www.biowatertechnology.com

Visit our WEFTEC booth #7803





whether that means making process changes, maintaining pumping rates or "keeping water off people during 100-year floods that seem to happen every two years."

Guyette, an operator at the facility for a little more than a year, calls Reeves "one of the top three bosses I've ever had. He has a huge heart. He puts his employees before everything else, and he respects your opinion. Kam is just a wonderful person."

Guyette is grateful for Reeves' support in two areas. First was helping him get up to speed during the "crazy time" he experienced as a rookie in early 2013 when he put in about 30 hours of overtime in one week because of heavy rains and flooding. The second was for helping him prepare for his Grade 1 license exam, providing "loads of literature" and study materials.

FOR THE LONG HAUL

Reeves sees educating team members as part of his job. He offered the same encouragement a few years ago to Mat Hazelwood, who worked as a seasonal employee directly out of high school.

Says Reeves, "He took the Civil Service exam, and we hired him as an operator when an opening came up. He was with us for two years, then went to work at the Des Moines Water Reclamation Authority, where he's now a night supervisor. It proves that with all the chances for advancement, water is an excellent career choice."

Reeves himself hopes to stay with the Ottumwa plant and retire "in possibly seven years." He recently bought two acres of land next to his home, giving him four acres on which he plans to build a log home in the next four or five years.

"I have no desire whatsoever to move to a larger town," says Reeves. "Ottumwa has plenty to offer, and while I don't enjoy winters as much as I used to, I don't plan to become a snow bird any time soon." **tpo**

featured products from:

Evoqua Water Technologies, LLC www.evoqua.com

Gorman-Rupp Company 419/755-1011 www.GRpumps.com (See ad page 31)

Nasco 920/568-5536 www.enasco.com (See ad page 86)

Municipal & Industrial Booth 4845



SEWER & CATCH BASIN CLEANING Single and double-pump jet-vac combination units with line jetting capabilities of 175 gpm. Catch basin cleaning available with per hour or per basin pricing.



SEWER TELEVISION INSPECTION We have the CCTV equipment and experienced technicians to perform any type of mainline or service lateral inspection you need. Powered by the latest computers and software.



WET/DRY VACUUMING Jobs that used to take days are completed in hours. Our custom-built vacuum vehicles can quickly cleanup the toughest, dirtiest material, no matter where it's located..

Other Services Available:

- Sewer Joint/Lateral Sealing
- GPS/GIS Data Collection
- No-Dig Cipp Point Repairs
- Manhole Rehabilitation
- Digester/Tank Cleaning
- Pit, Pond & Lagoon Cleaning
- Sludge Dewatering
- Water Blast Cleaning
- and much more.

All Work Backed by Our Unmatched Guarantee: You must be satisfied or you pay absolutely NOTHING for our services.



Pumping Up Efficiency

A RHODE ISLAND TOWN EXPECTS PAYBACK OF 3 1/2 YEARS ON AN EXTENSIVE PROJECT TO UPGRADE INEFFICIENT PUMPS AND INSTALL VARIABLE-FREQUENCY DRIVES

By Chris Champi, Rob Little, P.E., and Mark Donovan

B asing the ratepayers' burden and shrinking the carbon footprint were the twin objectives of the Cumberland Water Department's modernization and upgrade of four pumping stations, including the main water treatment plant.

Improvements to date have earned an incentive payment from the local utility and slashed electricity consumption to the point where the town expects to recoup its \$235,000 investment in 3 1/2 years.

In summer of 2012, Cumberland collaborated with the Rhode Island Public Energy Partnership, whose mission is "to achieve deep energy savings in state and municipal facilities." That summer, the town signed on with National Grid's Commercial and Industrial Energy Efficiency Program. National Grid, a multinational electric and gas utility headquartered in the United Kingdom, supplies electricity to some 470,000 customers in Rhode Island.

MORE EFFICIENCY, LESS CONSUMPTION

Located in the northeast corner of the nation's smallest state, due north of the capital city of Providence, Cumberland has about 35,000 residents. In early 2012, the Water Department set out to improve water-pumping efficiency and issued a task order to determine the best opportunities for energy savings, with planning and engineering assistance from the Woodard & Curran engineering firm. The task order encompassed:

• Reviewing information about the efficiency improvement grant program to identify potential upgrade funding.



Three new variable-frequency drives at the Marshall Avenue station.

- Collecting available pump and motor information, including nameplate pump head and flow, motor speed, voltage, horsepower and drive operation.
- Collecting and reviewing station operational data, including flow, pump head, suction and discharge pressure under various conditions, on-off sequence, valve throttling, electrical consumption and impact on upstream and downstream facilities.
- Developing recommendations for pump and motor replacement and drive installation to improve operational efficiency at each station.
- Developing cost estimates for various potential improvements.

Among other improvements, the team recommended that the town replace its 125 hp finished water pump at the Sneech Pond Water Treatment Plant with a 100 hp pump system controlled by a variable-frequency drive (VFD). The plant, at the north end of town, treats Sneech Pond source water and pumps both raw and finished water.



New motors and pump at the Marshall Avenue Booster Pump Station. New motors with variable-frequency drives were placed on all three pumps at this station, and one pump (painted blue) was replaced with a smaller pump suitable for lower flows.



With confirmation from National Grid that the proposed upgrades at the plant and three other facilities would satisfy the requirements of the utility's energy efficiency program, construction began in the second week of October 2012. The new equipment was installed and operational two months later. The town and the utility then tracked energy consumption throughout 2013.

MULTIPLE UPGRADES

Sneech Pond, the town's main water treatment plant, is a 1.0 mgd facility built about 50 years ago. With substantial modernization in 2006-07, when a SCADA system was installed, the facility was up to date with modern process equipment by 2012. The raw water pumping and flocculation, sedimentation and filtration processes were all upgraded.

As a result of the 2006-07 upgrade, the raw water pump and VFD combination is controlled by the SCADA system. The SCADA system and VFD are optimized to ramp pump speed and corresponding flow up and down efficiently, maintaining clearwell levels while accounting for filter backwash demands without hindering filter operation or turbidity removal.

Despite these earlier upgrades, at the Sneech Pond plant and at several locations around the town, water was still pumped inefficiently, using constant-speed motors through flow-control valves. Budget limits at the time precluded replacement of this equipment.

With a renewed focus on energy efficiency, with the support of its engineering consultant, and with incentive-based funding from the utility, the town in 2012 substituted energy-efficient motors governed by VFDs at four facilities. The new motors and VFDs, which operate at a speed appropriate

for real-time water demand, replaced pumps that had worked equally hard in low-flow and high-flow periods.

The town replaced one of the old Sneech Pond plant's finished water pumps with a new, smaller pump, motor and VFD to pump more efficiently to the distribution system at the required flow rate. To maintain redundancy and further improve efficiency, a 100 hp finished water pump was refurbished and a new, high-efficiency motor and second VFD were installed.

A similar upgrade was made at the Marshall Avenue Booster Pump Station, Cumberland's water purchase point from the neighboring Pawtucket (R.I.) Water Supply Board. Based on historical water demand, two 100 hp pumps at this station were typically throttled back 40 to 80 percent. After the 2012 upgrade, the station can pump a maximum of 4.5 mgd with two new 75 hp motors governed by VFDs. Its current peak demand is 1.0 mgd.

These pumping systems replaced the oversized 100 hp motors whose excess capacity made them energy-inefficient. In addition, a third pump at the Marshall Avenue facility was replaced with a smaller pumping system, also equipped with an energy-efficient motor and VFD, to work efficiently in low-flow winter periods.

The Manville Well No. 1 and No. 2 pumping stations, about 100 yards apart, supply a combined 800,000 gpd to the system. Two new 60 hp motors with VFDs operate both pumps at peak efficiency. The new equipment replaced outdated, inefficient pumps and significantly reduced energy consumption.

Replacing constant-speed motors and flow-control valves with VFDs on energy-efficient motors vielded three benefits:

- A one-time \$109,000 incentive payment from National Grid
- Lower monthly electric bills
- Smaller carbon footprint

TRACKING POWER USAGE

With energy-efficient motors and VFDs in place in December 2012, the town and the utility tracked electricity usage throughout 2013, and National Grid paid the \$109,000 energy efficiency incentive in January 2014.

Electrical savings were 41 percent (about \$17,500 per year) at the Sneech Pond plant. Based on lower

flow rates and pressure head requirements, energy savings at the three other pumping stations were lower than at Sneech Pond, but still measurable and significant.

The combined savings will continue year after year and, along with the utility incentive payment, will allow the town to recoup its total investment in 3 1/2 years. And the efficiency enhancements to date are not the end of the story: The Water Department continues to seek efficiencies that will deliver potable water to residents reliably and at the lowest cost.

ABOUT THE AUTHORS

Chris Champi (cchampi@cumberlandri.org) is water superintendent in Cumberland, R.I. Rob Little, P.E., (rlittle@woodardcurran.com) is a vice president and senior project manager with the Woodard & Curran consulting firm in Providence. Mark Donovan is senior commercial energy consultant for National Grid in Providence. tpp



Reusing More, Using Less

A MAINE COMPOSTING FACILITY CREATES BENEFICIAL RECYCLED PRODUCTS AND DOES IT WITH LESS ENERGY, THANKS TO INNOVATIONS LIKE GEOTHERMAL HEATING AND COOLING

By Doug Day

A s the largest municipal biosolids composting operation in New England, the Hawk Ridge Compost Facility's main purpose is the beneficial reuse of the solids produced in treating wastewater. Operated by Casella Organics, the site in Unity serves more than 30 treatment plants in Maine and surrounding states, turning biosolids into Class A compost. "Many of our customers have been with us since we opened in 1990," says Jen McDonnell, director of sales and marketing. "Many large

wastewater treatment plants around the area are anchor customers for us." As the first private company certified under the Biosolids Management Program through the National Biosolids Partnership. Hawk Ridge achieved

Program through the National Biosolids Partnership, Hawk Ridge achieved Platinum Certification — the highest — in 2011. The voluntary program promotes resource recovery from biosolids and provides training and support to reduce operating costs and achieve efficiencies.

"One of the goals we identified was reducing the energy used," says McDonnell. "Our efforts have improved energy usage dramatically — we've seen more than 27 percent reduction in kilowatt-hours used per cubic yard of processed material."

FROM THE GROUND

The biggest energy innovation is geothermal heating and cooling, installed when a new office building was added to the Hawk Ridge facility in 2010.

When you recycle biosolids, you keep valuable nutrients in the ecosystem. It is also a carbon-sequestration strategy, because improving the soil helps support plant growth, and plants sequester carbon."

The system is a bit more complicated than normal. "We sometimes call it a geo/biothermal system," says McDonnell. "We're using a byproduct of our process."

Like a typical geothermal system, the Hawk Ridge installation uses the natural temperature of the underground soil to cool the office building in summer, by way of underground piping and a heat exchanger. In winter, heat from the 110-degree process water warms the soil around the system's underground lines so that the heat pump doesn't have to work as hard. The hot water comes from the odor-control scrubber.

The Hawk Ridge facility creates compost from biosolids and other materials, such as food waste, wood ash, yard waste, shredded paper, fish waste and wood waste.



The system was expanded in 2011 to include winter heating for the maintenance shop. The total investment of \$40,000 is saving Hawk Ridge another \$10,000 a year above other savings produced by operational and lighting improvements.

GOING ON THE GRID

Another big change is in the electric power supply. The facility originally was powered by on-site diesel generators, but fast-rising fuel prices prompted Hawk Ridge to hook up to the utility grid in February 2009. "We paid to bring in three-phase



The facility's offices, built in 2010, have a geothermal heating system that uses waste heat from a scrubber to improve efficiency in winter.

power from 5 miles away, and that really helped us from an environmental impact standpoint," says McDonnell. "We have a lot of hydro and renewable power in Maine, so transitioning to grid-based energy

through Central Maine Power was a big environmental improvement for us."

With diesel prices above \$4 a gallon, the \$290,000 investment, aided by a \$50,000 state incentive, provided a quick payback, saving the plant about \$200,000 a year on fuel.

The next step was to seek operational efficiencies to save even more energy and money. The 4-acre composting operation includes covered storage, mixing facilities, composting buildings and six composting tunnels with computer-controlled air recirculation, an ammonia scrubber and a biofilter for odor control. The energy efficiency changes include: *(continued)*



- municipal and industrial
- servicing ALL brands
- I,000's of installations globally
- system evaluations/inspections
- performance contracts
- maintenance programs

Aeration Works is the largest and most respected wastewater aeration maintence & service firm in the world. From system evaluations to system installs the highly trained team at Aeration Works can help you with all your aeration needs.



For a FREE system evaluation - Give us a call! Call us at 877.334.2478 or visit us at www.aerationworks.com

A division of Environmental Dynamics International

weftec 2014 Booth 7319





The Hawk Ridge Compost Facility produces 80,000 cubic yards of product per year.

- Monitoring blower operating flow rates
- Raising the temperature setpoint of the odor-control scrubber
- Using premium efficiency models as motors are replaced
- Placing timers on all equipment block heaters

Through Efficiency Maine, interior and exterior lighting was upgraded to premium efficiency lighting (Wiswell Electric). The program provided \$2,300 cash incentives toward the total cost of \$12,000, along with advice to help save energy and money.

Many of the T-12 fluorescent lighting fixtures across the facility were upgraded to the more efficient T-8 lights. Others were replaced with newer T-5 high-output fixtures that produce more light with even less energy than

the T-8s. "From 2010 to 2012, we reduced our electricity consumption by 23 percent, for an annual savings of about \$20,000," says McDonnell.

PROOF IN THE PRODUCT

Hawk Ridge takes in about 45,000 cubic yards of biosolids and other organic feedstocks per year. The facility is permitted to accept municipal biosolids, food waste, wood ash, leaf and yard waste, shredded paper, short paper fiber, fish waste and wood waste. It distributes 80,000 cubic yards of product annually, enough to cover 42 football fields with about a foot of compost.

"A lot of what we do is providing materials to improve soil quality, reduce runoff and improve crop yields," explains McDonnell. Marketed under the Earthlife brand, the products from Hawk Ridge include:

- Premium compost Class A compost to benefit plant growth and soil health
- NutriMulch Compost-enriched mulch
- Super-Peat A custom blend of sphagnum peat and compost
- GrowMax A multipurpose product made from horticultural-grade ingredients including Maine blond sphagnum peat, compost and Superhumus (Casella's blend of forest soil, fine bark, organic matter, sand and fine stone)

"When you recycle biosolids, you keep valuable nutrients in the ecosys-

tem," says McDonnell. "It is also a carbon-sequestration strategy, because improving the soil helps support plant growth, and plants sequester carbon. Our services are environmentally friendly and help address some of the challenges of our time." **tpo**

What's Your Story?

TPO welcomes news about environmental improvements at your facility for the Sustainable Operations column. Send your ideas to editor@tpomag.com or call 715/277-4094.





Leading Edge Features. Optimal Performance.



Blue-White Industries

5300 Business Drive, Huntington Beach, CA 92649 USA 714-893-8529 • fax: 714-894-9492 • sales@blue-white.com www.proseries-m.com • www.blue-white.com



top performer

water: **PLANT**

Phil Iverson, operator with Clay Rural Water System, runs checks on the Wakonda water treatment plant's emergency generator (Cummins Power Generation).

Small Town, Not Small Tech



TECHNOLOGY HELPS A WATER SYSTEM IN RURAL SOUTH DAKOTA OPERATE EFFICIENTLY, DEPLOY EFFECTIVE TREATMENT METHODS AND DELIVER QUALITY CUSTOMER SERVICE



STORY: Jim Force PHOTOGRAPHY: Jay Pickthorn

THE CLAY RURAL WATER SYSTEM IN SOUTHEAST South Dakota covers 735 square miles and has a population of around 5,100 — less than 10 people per square mile.

Yet the system includes some of the latest water utility technologies — reverse osmosis, a sophisticated SCADA system and a two-way automated meter reading network that records water usage on an hourly basis.

Team members Tom Hollingsworth, operations supervisor; Phil Iverson and Rob Ganschow, operators; and Greg Merrigan, system manager; supported by office manager Donna Henriksen and accountant Janice Lyso, have used that technology — plus good old-fashioned operations skill — to earn the system a Decade of Drinking Water Excellence Award from the South Dakota Department of Environment and Natural Resources.

"The award was based on our record of sampling, source water protection and operator certification," says Merrigan, "plus our record of compliance over the last 10 years."

ONE SYSTEM

The Clay Rural Water System was formed out of a desire among residents to obtain better-quality water and work together as a rural community, accord-

Clay Rural Water System, Wakonda, S.D.

-
INCORPORATED: 1975
SERVICE AREA: Clay County, parts of four neighboring counties
POPULATION SERVED: 5,100 (2,275 connections)
SOURCE WATER: Groundwater
TREATMENT CAPACITY: 1.5 mgd
TREATMENT PROCESS: Conventional, reverse osmosis, pressure filtration
INFRASTRUCTURE: 2 water treatment plants, 1,400 miles of distribution lines, 5 booster stations, 7 reservoirs
SYSTEM STORAGE: 1.04 million gallons
ANNUAL BUDGET: \$1.9 million
WEBSITE: www.clayruralwater.com
GPS COORDINATES: Latitude: 42°59'09.59" N; longitude: 96°57'48.55" W



SECURING THE SOURCE

The Clay Rural Water System's source water protection plan was a highlight of the system's recent award from the state of South Dakota. Around each of the groundwater supply wells, the plan identifies a 10-year travel time zone — the area that contributes water to a well over a 10-year period.

"In the case of our Wakonda wells, the zone is about 1 mile by 1 mile," says Greg Merrigan, system manager. "For our south plant, the zone is about 1/2 mile by 1/2 mile." Once the zones were established, Clay Rural Water worked with area landowners and farmers to identify any potential hazards that could affect the wells. "We worked with both counties to develop zoning that restricts activities within the zones," says Merrigan. "They have been very cooperative."

The 140-foot-deep wells serving the Wakonda plant are near a plentiful aquifer in a rural area with very little development. The 300-foot-deep wells serving the Wynstone plant are located in a rural housing development and are not susceptible to surface contamination. "Both well sites are located in good spots," Merrigan says. "Planners hit a home run when they located them."

ing to the utility's website. In the early 1970s, a countywide survey on water quality and quantity led to formation of a steering committee to explore a central system. The water system was incorporated on July 21, 1975. Member sign-ups, engineering and construction followed, and in fall of 1980 the system was fully operational.

Today, the system consists of two drinking water treatment plants and

1,400 miles of distribution lines (1/2 to 8 inches) providing fresh, clean drinking water through 2,275 connections. The water treatment plant in Wakonda, designed to produce 880 gpm, uses a combination of softening and filtration. Raw water comes from two 140-foot-deep wells, each with 1,200 gpm capacity. The water is aerated to reduce taste and odor, then dosed with lime, soda ash and coagulants to soften it and settle out solids.

A 25-ton tank (TOMCO2 Systems) supplies carbon dioxide to a Wallace & Tiernan carbonation process (Evoqua Water Technologies) that adds CO₂ to lower pH. The flow then passes through four General Filter gravity sand filters (WesTech Engineering). Finished water is chlorinated and fluoridated before delivery by four Layne highservice pumps to an in-ground reservoir (A. O. Smith) and then to the clearwell and distribution system. About 300,000 gallons are delivered in bulk to the communities of Wakonda and Gayville. "We supply it to a vault on the edge of the communities, and they distribute it through their own lines," Merrigan explains.

At the Wynstone plant, about 20 miles south of Wakonda, source water is also drawn from two wells 300

feet deep, each with 350 gpm capacity. Treatment is quite different. The current equipment had to be installed within the tight footprint of what had been a small treatment plant in a housing development before the agency expanded into that part of the county in 2005.

"This plant is located next to the Missouri River," Merrigan says. "Reverse osmosis was the choice because the reject water could be discharged by per-(continued)

Your partner for sustainable solutions in water treatment

BASF understands today's global water management challenges and is responding by delivering world-class technologies and sustainable solutions. From water production, through water use and water purification, BASF has leveraged its expertise and extensive capabilities to protect, conserve and sustain the earth's most precious resource — water. As the world's leading chemical company, we are dedicated to your success by bringing to you over 100 years of comprehensive experience, technology, innovation and commitment. At BASF, we create chemistry.

www.watersolutions.basf.com

The Chemical Company

Sept Sit Us New Ctore Corrector Booth Stress La



mit into the Missouri, and because the RO units [Harn R/O Systems] don't take up much space. It was a perfect setting."

A separate portion of the raw water at Wynstone passes through General Filter pressure filters (WesTech Engineering). The RO and pressurefiltered flows are blended and sent on to aeration, caustic addition for pH control, chlorination and fluoridation. A pair of high-service pumps (Layne) push the water to a 250,000-gallon elevated storage tank. It then flows by gravity to customers, including four housing develop-

Reverse osmosis was the choice because the reject water could be discharged by permit into the Missouri, and because the RO units don't take up much space. It was a perfect setting."

ments and a number of farms—about 20 percent of Clay Rural Water's connections.

About 20 percent of the water passes through the pressure filters and the rest through the RO membranes. "If we ran 100 percent through RO, the water would be too pure," Merrigan says. "By splitting the flow, we get the right balance of hardness and salinity."

Merrigan and the staff are pleased with the RO units. "We add an antiscalant and that's it," he says. "The units have operated for seven years and work very well." He says Harn has been very helpful and anticipates having to acid clean the units only once every five years or so.

Filter backwash water is discharged to lagoons at the Wynstone plant. At Wakonda, lime sludge is pumped to drying lagoons, and a contractor trucks the dewatered mateHydrant flushing is a routine maintenance procedure for Rob Ganschow and the Clay Rural Water operations team.

rial to farms as a soil amendment. "There's always a demand for it here," says Merrigan. "It is very beneficial."

The entire Clay Rural Water network of plants and distribution lines is managed by an Allen-Bradley SCADA system (Rockwell Automation) so that operators can monitor and control processes on their laptop computers and iPhones. That's important to a rural system that measures 30 miles top to bottom and 25 miles wide. "We used to run the 'milk route' three times a week, but now we only travel it once a week," says Merrigan. "While we've invested heavily in SCADA, the result is a huge cost savings in operations. We're really spread out." *(continued)*



LET'S MAKE THIS PERFECTLY CLEAR!

The heart of any biological process is the operation and performance of the final clarifiers and the Lakeside design is clearly superior. Our Spiraflo Clarifier's peripheral-feed design provides the best hydraulic flow pattern and performs two to four times better hydraulically than centerfeed clarifiers. The Spiraflo produces the highest quality effluent, and eliminates short-circuiting and sludge wall creep, problems associated with competing centerfeed designs. Our Spiravac Clarifier offers rapid suction removal of activated sludge. Compare performance, warranty and cost, and you'll see why Lakeside is clearly your best choice!

Speak to one of our experts at 630.837.5640, email us at sales@lakeside-equipment.com, or visit www.lakeside-equipment.com for more product information.



Cleaner Water for a Brighter Future®



Clarification Components Spiraflo Clarifier Spiravac Clarifier Full Surface Skimming



MAKING IT BETTER

Life has not been without challenges for the Clay Rural Water team. A drought in 2007 stressed the system to its capacity and prompted the leadership to hire an engineering firm to study the plants and distribution system. The review identified some \$3 million in potential improvements. That was beyond the agency's financial capabilities, but the timing was right because it coincided with the launch of the American Recovery and Rein-

vestment Act of 2009. Clay Rural Water applied for stimulus funds and received \$1.3 million in grants and loans over the next two years, enough to implement several "shovel ready" projects, including:

- Two new booster stations and additional pumping capacity at the Wakonda plant.
- A new well to replace two soon-to-be abandoned wells at the Wakonda plant.
- Interconnects with neighboring communities to provide emergency water if needed.
- Looping of distribution lines in remote areas so that customers are served by two-way flows, rather than just one-way.

The improvements have helped. "In 2012, we had another dry year, but we were able to keep up without any problems," says Merrigan. Perhaps the biggest improvement was automated reading. In the early days, customers took their own meter readings, calculated their bills and sent in their payments. Or they simply made estimates and paid the bill. Customers didn't



Gravity sand filters inside the Clay Rural Water System water treatment plant (WesTech Engineering).

find that inconvenient, says Merrigan, because "they knew what it was like in the days before the rural water system."

Gradually, however, customers changed; new users preferred to get a statement in the mail, pay for their usage, and avoid the nuisance of reading

We used to run the 'milk route' three times a week, but now we only travel it once a week. While we've invested heavily in SCADA, the result is a huge cost savings in operations." GREG MERRIGAN

> the meter. Last spring, Clay Rural Water was changing out the old meters and adopting a fixed-base system (Sensus) that will record data at the user's end every hour and communicate it to antennas on three of the system's water towers. Each antenna is connected to a data collector that forwards the data via the Internet to a server in the main office, where reports will be generated every morning and bills prepared.

> The transition to the new system was to be complete by the end of 2014. "We've spent about \$700,000 on the new system and made it work within our rate structure," Merrigan says.



Tom Hollingsworth tests finished water at the Wakonda treatment plant laboratory.

SHUTTING DOWN LEAKS

Besides customer convenience and more accurate readings, the AMR system will help the system deal with leaks, which have numbered about 25 per year. The area's clay soil easily absorbs moisture and expands during the rainy season, then dries out and contracts, so the ground is always moving. "Some areas have a high water table as well. which can make it difficult to locate leaks," Merrigan says. The utility's goal is to keep water loss below 15 percent.

GREG MERRIGAN

"Because we are reading meters every hour, the new system will enable us to pinpoint leaks on the customer side and alert them to a problem," Merrigan says. "It will allow us to provide a higher level of customer service." It's just one more advantage of making technology work for a small water agency. tpo

featured products from:

A. O. Smith 800/527-1953 www.hotwater.com

Cummins Power Generation 763/574-5000 www.cummins.com

Evoqua Water Technologies, LLC 815/623-2111 www.evoqua.com

Harn R/O Systems Inc. 941/488-9671 www.harnrosystems.com

Lavne/Verti-Line 913/371-5000 www.lvlpump.com **Rockwell Automation** 414/382-2000 www.rockwellautomation.com/ industries/water

K Because we are

every hour, the new

system will enable us

to pinpoint leaks on the

customer side and alert

them to a problem."

reading meters

Sensus 800/638-3748 www.sensus.com

TOMCO2 Systems 800/832-4262 www.tomcosystems.com

WesTech Engineering, Inc. 801/265-1000 www.westech-inc.com



The **REGAL[™] Gas Chlorinator** is made with pride in the USA and sets the standard for safety, reliability and economy. REGAL also leads the industry in green technology: lowering energy costs and chemical costs by using 100% chlorine which is a natural element.

★ ALL-VACUUM DESIGN ★ EASY TO MAINTAIN & CLEAN ★ ENGINEERED FOR LESS DOWNTIME & CORROSION RESISTANCE 🛨 FEWEST PARTS 🛨 FAST DELIVERY

For more info. call Anna at 1-800-327-9761

Circhlorinators incorporated

1044 SE Dixie Cutoff Road, Stuart, FL 34994 USA • Tel: 772-288-4854 Fax: 772-287-3238 • www.regalchlorinators.com • Email: regal@regalchlorinators.com

Visit us at Booth 8845 WefteC 2014

H Series REGENERATIVE BLOWER

15th Year All-Star is celebrating their 15th year anniversary by introducing the "H" series blowers as standard*

"H" Series Temperature Comparison

	All-Star	Competition
Motor Insulation	355° F	265° F or 315° F
Bearing Grease	380° F	280° F
Seal	500° F	280° F

* No additional charge for these premium features • 1/4 to 30 HP Pressure to 11.5 psig Flow to 900 SCFM · Oil-free clean air Vacuum or Pressure Single and Two Stage Models RoHS Rolus 20,000 All-Star blowers have been installed in North America WWTP's since 1999 Tel 800-431-8258 http://www.all-star-usa.com

An aerial view shows the well-kept ground and buildings at the facility in Orem, Utah.

Cleaning by Contest

A FRIENDLY COMPETITION AMONG TEAM OF PLANT WORKERS KEEPS THE OREM TREATMENT FACILITY CLEAN AND LOOKING SHARP FOR VISITORS

By Jeff Smith

eeping a wastewater treatment plant outstandingly clean and presentable is easy, says Lawrence Burton, Water Reclamation Section manager of the 13.5 mgd (design) facility in Orem, Utah. Competition and a contest are the keys — along with a great payoff to the winners.

Burton attributes the success to the plant's 27 full-time and five parttime employees. They're divided into six groups; each is assigned a section of the plant and is responsible for all aspects of cleanliness and neatness. "It has become quite a contest," says Burton.

Once each quarter, an inspection team made up of two members from each group gets together with Burton to select the winning group. Winners are recognized at the plant's quarterly safety and information meeting; the group's members receive a paid half-day off. "It has worked out really well," Burton says. "Consequently the plant is kept very clean and clean looking." ter, however, a committee of representatives from each group conducts a formal inspection using a checklist and a score sheet.

Winners schedule their half-day off just as they would a regular vacation day. The only stipulation is that the half-day off cannot be carried over to the following quarter. "To the employees, it has become more than just a day off," Burton says. "It has become a matter of pride, and the result is the facility always looks good."

OPERATORS' BRAINCHILD

The idea for the contest was spawned about two years ago during a weekly coordination meeting of the senior plant operators (SPOs). Members were asked for ideas on how to improve plant cleanliness. "We wanted a way for all the employees to take ownership in the facility and put forth the effort to

CHANGING DUTIES

To keep the contest fair, the groups rotate among the plant sections each year. The areas of responsibility have a total footprint of 7.5 acres and include all the hard surfaces of the plant, such as process buildings and structures, outbuildings and parking lots. The lawn care and landscaping is contracted to a local company.

The inspection committee members continuously observe and keep notes instead of having announced inspections. At the end of each quar-



All staff members at the Orem treatment plant share in keeping the property clean and manicured and the buildings freshly painted.

Sure is Fitting for the Environment!

Pipe Fittings

- Cost effective
- · Corrosion, biological, chemical resistant
- · Electro and Heat fusion joining leak-proof system
- Lightweight and UV resistant
- Superior flow

Sure-Grip® Concrete Protective Liners

- Long service life
- Economical installation
- Low maintenance
- UV and chemical resistance
- Wide temperature range

This information is provided for reference purposes only and is not intended as a warranty or guarantee. Agru America, Inc. assumes no liability in connection with the use of this information.

- Abrasion resistant
- High back-pressure resistance
- Available in HDPE, PP, PVDF, and ECTFE

Please visit us at WEFTEC Booth #3653 Georgetown, SC and Fernley, NV 800-373-2478 • www.AgruAmerica.com • ads@agruamerica.com

keep it looking good," says Burton.

Since then, membership in the SPO group has grown to include Scott Bergera, collection system field supervisor; Ned Miner, plant field supervisor; Allan Hadfield, biosolids senior plant operator; Blaine Shipley, maintenance senior plant operator; Troy Houghton, pre-

Share Your Ideas

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

treatment coordinator; Norm Atkin, instrumentation and control specialist; Joe Jamison, GIS/GPS specialist; Randy Sandoval, process control senior plant operator; and Burton.

Originally, employees spent three to four hours a week cleaning up their areas. Now it's an ongoing process that seems to take very little time. "Almost every time anyone comes to the plant we get compliments on how good it looks," Burton says.

NOW SURROUNDED

It wasn't always that way. The original plant, built in 1958, was relatively remote from its community. More recently, urban sprawl has surrounded the facility with residential neighborhoods, business parks and a golf course. And the plant's receiving water has become a major bird refuge that attracts bird watchers and outdoor enthusiasts from all over the region.

"When there is a water reclamation facility near your home or business, it usually has the stigma that it is just a sewer plant," says Burton. "Now the facility is aesthetically pleasing. We do quite a bit to keep all of our neighbors happy with us."

In 2013, the plant was nominated for an award by the Water Environment Association of Utah. During the evaluation team's tour, one evaluator asked, "Does your plant always look this good?" The facility didn't win the award, but Burton observes, "The question made us all feel good about what we do." tpo



The Ford Hall Company's Algae Sweep Automation weir cleaning system for clarifiers and thickeners has improved ... has transformed into the Weir-WolfTM!

The Weir-Wolf™

ELIMINATES man-hour cost associated with daily hosing and weekly cleanings ADDRESSES safety concerns associated with entering the clarifiers for cleanings **OPTIMIZES** clarifier/thickener performance **ENHANCES** clarifier/thickener appearances ASSIST UV and disinfection systems **IMPROVES** TSS and sample readings to maintain compliance by providing constant cleaning

The Weir-Wolf is still designed to clean algae from secondary clarifiers but can also be used in municipal and industrial ns to remove debris and gae build up in primary clarifiers, ediate tanks and thickeners; they are covered or open to the



For more information, please visit our website www.weir-wolf.com or call 800-928-2070

Seeing the Big Picture

A TOTAL SYSTEMS APPROACH TO WASTEWATER TREATMENT HELPS INDUSTRIAL FACILITIES DEVELOP SOLUTIONS THAT COST-EFFECTIVELY MEET PERMIT COMPLIANCE AND BUSINESS OBJECTIVES

By Chandler Johnson

ndustries that must treat or pretreat their wastewater face varied challenges. Any given facility's needs are best met by a total systems approach (TSA) a fully integrated solution that includes all pieces of the puzzle instead of uncoordinated components and systems.

The approach includes a collaborative evaluation up front to understand a facility's requirements, apply proven designs and materials, and select innovative products that achieve the optimum water quality at the best life cycle cost.

WHY A TOTAL SYSTEM?

A true TSA first identifies options to help achieve a company's production goals. The next step is to develop a detailed design in collaboration with facility engineers. Components and equipment are then selected with an eye on durability and optimum design. The overall system is fitted together with a focus on long-term reliability and consistent performance.

Efficient installation, startup and training are important pieces of a TSA. Compliance is ensured through binding performance guarantees. Extended service plans can make the solution provider almost an adjunct to the company's process engineering team. The final piece of the TSA is a complete system warranty.

from the degradation of the soluble organics in the wastewater. The DAF process has the added benefit of handling pH swings without corrosion.

To degrade soluble organics, Dannon selected moving bed biofilm reactor (MBBR) technology, a biological process that has been used not only for BOD removal but also for nitrification/denitrification. The system has been applied successfully at several dairies with widely variable wastewater loads. The total system also includes rotary screening to remove debris and equalization to normalize the flow and load.

Dannon implemented the turnkey design, engineering and construction project in partnership with an engineering firm and a manufacturer of specialized, advanced wastewater treatment solutions. The project included supply of the DAF and MBBR, a slot injector system

to move wastewater from the equalization tank through the treatment package, chemical feed equipment, startup and commissioning, and a performance guarantee.

Within a few weeks, the DAF units were operating at a fraction of the cost of the previous unit. The system is designed for easy expansion. The plant has won awards at environmental conferences in the food industry.

A TSA includes a collaborative evaluation up front to understand a facility's requirements, apply proven designs and materials, and select innovative products that achieve the optimum water quality and the best life cycle cost.

ycle cost. company in Arkansas City, Kan., shows how a TSA can reduce land, labor and operational costs versus

ASEPTIC PACKAGER

The experience of KanPak, a

family-owned aseptic packaging

SYSTEM UPGRADE

The TSA applies custom solutions tailored to each facility's treatment requirements. Three examples show that while a TSA may align the puzzle pieces differently, an in-depth evaluation in each case sets the stage for a truly integrated and trouble-free solution.

DAIRY PLANT EXPANSION

A TSA came into play with the upgrade of the wastewater treatment system for Dannon's yogurt production facility in Utah. Just two years earlier, the company had installed a circular dissolved air flotation (DAF) pretreatment system, but found it poorly designed, with poor performance and high operating costs from chemical consumption.

Recognizing that the process would not handle additional wastewater from a facility expansion, the company decided to construct a new treatment system. After evaluating technologies, the firm selected a system that uses two rectangular high-rate DAF units, one to separate suspended solids and fats, oils and greases, and one to separate biological solids generated conventional approaches such as activated sludge, while ensuring effluent permit compliance.

KanPak, which packages products such as smoothies, coffee drinks, creamers, frozen desserts, ice cream mixes, cocktail mixes and specialty beverages, prides itself on technological advancements that include stringent quality control through each step of production.

To meet discharge and pretreatment requirements at one of its facilities, the company had installed a traditional biological treatment system with an interceptor/pump station, equalization tanks, aerobic fixed-film treatment, secondary solids separation, DAF with a flocculation tank, a compressor/ pressure tank, sludge dewatering on a vertical rotary screw press, and final effluent flow and pH monitoring.

Within a week of startup, the process had failed; solids would not flocculate, and the effluent was out of compliance. The plant had been quickly overwhelmed by production discharge along with hot water, sanitation products, floor foams, clean-in-place chemicals and sterilants. The design (continued)

Dissolved Ammonia Monitor

Proven Measurement Approach



The Q46N uses relative chemistry that converts ammonia in solutions to a stable monochloramine compound equivalent in concentration to the original ammonia level. The measurement is then made with a proven amperometric sensor.

FEATURES

- New Approach to On-Line Ammonia Measurement
- Total Ammonia Measurement
- Optional Free and Monochloramine Measurement

Toroidal Conductivity

Non-Contacting Conductivity System



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

Good Performance in Dirty Applications

- Multiple Monitoring Configurations
- Easy Calibration

Dissolved H₂S Monitor

Keep Chemical Costs Under Control



The 046S/66 Monitor take a unique approach to the measurement, employing a unique gas phase method to continuously monitor sulfite values without contact between the sensor and the water sample.

FFATURES

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

Total Chlorine Measurement

Amperometric Measurement



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

FEATURES

- Direct Reading Membraned Amperometric lodine Sensor
- High Accuracy and Sensitivity Down to PPB
- 2-Assignable 4-20 mA Outputs for Chlorine, Temp or PID

Toxic & Combustible Transmitter

Internal Data Logger



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

- FEATURES
- Interchangeable "Smart Sensors"
- Internal Data-Logger
- Optional Sensor Daily Auto-Testing

Portable Gas Leak Detector

Interchangeable "Smart Sensors"



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

FEATURES

- Interchangeable "Smart Sensors" for Over 30 Gases
- Internal Sample Pump and External Sampling Wand
- One-hand Pistol Grip Design

L-Blast **Automatic Sensor Cleaner**



Introducing Q-Blast!

ATI's New Q46D Dissolved Oxygen System with Q-Blast Sensor Cleaner provides reliable D.O. measurement using either optical or membrane sensors. The Q-Blast D.O. System is ideal for aeration control system, resulting in improved process performance and energy savings. Installation is simple and maintenance is lower than any competitive system.

*This system also works with our NEW Q46P/R monitor with reliable pH / ORP measurement.

COME CHECK US OUT AT WEFTEC14! Booth #7729

800-959-0299 www.analyticaltechnology.com







load was 2,800 pounds per day of BOD_5 , but the actual load was 5,600 to 14,000 pounds per day.

To resolve the challenges, KanPak embarked on a TSA, also with an engineer and manufacturer. An evaluation of the treatment system found that the equalization tank was not designed properly for dairy wastewater, which can go septic within hours if not properly handled. The resultant low pH was affecting downstream processes.

In addition, the system was not properly dewatering, and sludge quality was poor. Finally, the system lacked primary treatment — high concentrations of milk fat require long hydraulic retention times for hydrolysis by bacteria and interfere with oxygen transfer.

The evaluation also considered an in-plant source reduction initiative that used an audit to identify and eliminate excess water usage. The audit led to recommendations for batching system modifications, directing boiler blow-down and domestic wastewater straight to the municipal treatment plant, closed-loop recirculation and conversion from a retort to an aseptic bottle line. As a result, the flow to the pretreatment system was reduced from 400,000 gpd to 100,000 gpd.

Taking all that into account, the TSA included improvements installed in phases over several years. The new system improved the equalization basin to prevent anaerobic conditions, added a second DAF, replaced nitric acid for pH control with CO_2 , upgraded biological treatment with a new aeration system and improved sludge dewatering (from 4 percent to 18 percent solids).

In the end, the project eliminated odors, reduced sludge volume, saved on chemicals and improved TSS and organics removal. The results included savings of \$100,000 per year through lower water consumption, \$4.5 million per year in sludge handling and chemical costs, and \$1 million per year in compliance costs.

FREEING UP MUNICIPAL CAPACITY

Improved industrial treatment through a TSA can also benefit municipal treatment facilities. Sara Lee/Hillshire Farm, needing to expand wastewater facilities for its Iowa turkey processing plant, began with an EQ-DAF-DAF system and then did further evaluation to determine whether biological treatment was needed. The evaluation over nine months allowed the company to review the initial system's performance and ask what could be achieved with the effluent if more treatment were added.

The company decided to add an MBBR, reducing effluent BOD and TSS to single digits. The load reduction means the municipal treatment plant now has significant additional capacity and will not have to expand.

It is important to focus on the total system because zeroing in on only one component may result in missing the bigger picture. Even if a company needs to replace only one piece of its system or add a new component, the project should still include a complete evaluation and a solution tailored to the facility's needs. **tpo**

Our operators are special because they are committed to delivering the best quality water they can, and that's what motivates them every day. "

Kirk Watson, Plant Supervisor, Aurora (Colo.) Water

Pride. It speaks volumes.

Hear what operators like Kirk have to say each month in *Treatment Plant Operator*.

FREE subscription at www.tpomag.com







275,000 Tanks and Covers Over 125 Countries





Aluminum Domes & Flat Cover Solutions for All Water & Wastewater Applications

- Formed & Extruded Flat Covers
- Superior Odor Control

- Corrosion Resistant
- Easily Removable Panels





Aquastore® and HydroTec® Storage Tanks

The Premier Choices for Long-Term, Minimal Maintenance Potable Water and Wastewater Storage Tanks

- Longer Tank Life = Lower Life Cycle Costs = Quicker ROI
- Faster Construction, Saving Time and Money
- Expandable
- Available in Diameters from 11 Feet to 204 Feet and Capacity from 20,000 Gallons to Over 6 Million Gallons
- Specific Tank Designs, Options and Accessories to Meet Customer Needs

CST | 9701 Renner Blvd, Suite 150 | Lenexa, KS 66219 | +1 913-621-3700 | www.cstindustries.com



1) The PURON MP system has a singlepotted cartridge configuration: There is no header at the bottom of the cartridge. The fibers hang loosely, enabling more effective air scouring.

2) The membrane systems are modular. Pre-engineered system capacities range from 0.1 mgd to 2 mgd per skid.

We did a pilot study in Brazil where a water utility draws from a shallow river. After a heavy rainfall, the feedwater turbidity went above 8.000 NTU. The water looked like mud: the membrane worked fine." MANNY SINGH

> nate a clarifier pretreatment step in many instances, minimize downtime and reduce chemical usage.

It includes an advanced cartridge design to enhance solids management and reinforced PVDF hollow fibers that are highly resistant to breakage. Manny Singh, senior vice president of technology with KMS, described the offering in detail in an interview with Treatment Plant Operator.

tpo: What did you observe in the marketplace that told you a membrane system of this type would be beneficial?

Singh: One challenge we saw with membrane systems was inability to handle high solids in the feedwater. For example, in a municipal wastewater treatment plant, if a clarifier is upset, that can result in a slug load of solids leaving the clarifier. If a downstream membrane cannot handle those high solids, it can clog very quickly.

Some membrane systems may apply a pretreatment process upstream to handle those high solids, or the operators may do an aggressive chemical clean whenever those upsets happen. In the case of the PURON MP system there is no need for pretreatment to handle high solids. The membrane itself will ride through those fluctuations with minimal operator intervention.

(DO: Have you observed similar performance in drinking water applications that draw from surface water sources of variable quality?

Singh: We did a pilot study in Brazil where a water utility draws from a shallow river. After a heavy rainfall, the feedwater turbidity went above 8,000 NTU. The water looked like mud; the membrane worked fine. There was no need for pretreatment or pre-clarification. The membrane was able to handle the high solids in a single-step process.

This technology also applies to waters that may be low in suspended solids and turbidity but high in total organic carbon or color. Some applications may have color at 200 to 250 TCU or higher, or TOC above 20 mg/L.

These organic-laden waters may require coagulant doses at 150 to 200 ppm of alum or ferric chloride to handle those TOC and color loadings. The ability of these membranes to handle such high levels can help in devising a single-stage system. There is no need to place a clarifier upstream of the membrane to handle those loadings.

LDO: What other market needs does this technology address?

Singh: Fiber breakage in membrane systems is a significant issue. Fiber breaks typically happen when membranes are stressed excessively,

PHOTOS COURTESY OF KOCH MEMBRANE SYSTEMS

Up to the Challenge

KOCH MEMBRANE SYSTEMS OFFERS A HOLLOW-FIBER ULTRAFILTRATION SYSTEM DESIGNED TO FUNCTION EFFICIENTLY ON FEEDWATERS HIGH IN SOLIDS, COLOR AND TOC

By Ted J. Rulseh

embrane filtration systems are proven effective in potable water and wastewater treatment applications, among others. However, streams high in solids can pose challenges for membranes, causing fouling that requires intensive chemical cleaning.

Koch Membrane Systems (KMS) now offers the PURON MP (formerly known as MegaPure) hollow-fiber ultrafiltration product line. It is designed for high-solids applications that include tertiary treatment for wastewater reuse, treatment of surface waters and waters high in total organic carbon (TOC) for drinking water, pretreatment for reverse osmosis (RO) and various industrial process waters.

The new line, with average continuous solids tolerance of up to 250 mg/L, is an outside-in flow system designed to simplify operations, elimi-





Suspended Air® Flotation (SAF™) Systems PROVIDE SOLUTIONS

Watch Video: Community Services District

ae and solids to achieve < 10 NTUs.

The Clear Advantage:

- ▲ SAF[™] Removes more solids
- SAF[™] Requires a smaller footprint (up to 1/5 of DAF)
- SAF[™] Uses less power (1/10 of DAF)
- SAF[™] Improves solids dewatering

Heron Innovators offers proven solutions to your wastewater treatment needs. Heron takes pride in providing complete customer support from initial sale to installation and operation.

"I would recommend Heron equipment to anybody. This system has eliminated many headaches." Bruce Stolinski, Sr. Mgr. Engr./Maint., Rosina Food Products, Inc., Buffalo N.Y.



 SAF™ PILOT TRAILER used to validate the SAF™ System.
 We offer benchscale and pilot testing services

Call Us Today!



such as during aeration or intensive chemical cleaning. That requires a lot of operator intervention — the filter trains have to be taken offline to repair the fibers.

Our system has supported membranes. The PVDF membranes are cast on a polyester braid that provides structural strength — you can't break it with your hands no matter how much force you apply. Supported membranes enable users to apply air scour at much higher rates without worrying about fiber breaks. That enhances the ability to remove solids from the fiber bundles.

There is no header at the bottom of the cartridge — the fibers hang loosely. That makes air scour more effective. The air follows the path of least resistance, so it can channel around and between the fibers where most of the filtered solids are concentrated."

tpo: What else is unique about this system?

Singh: This is the only membrane system that has a single-potted cartridge configuration. There is no header at the bottom of the cartridge the fibers hang loosely. That makes air scour more effective. The air follows the path of least resistance, so it can channel around and between the fibers where most of the filtered solids are concentrated.

tpo: Are there any advances in the membrane fibers themselves? **Singh:** We did substantial research to optimize the chemistry of the membranes. The pore size is very uniform at 0.03 micron. If the membrane pore size distribution is too wide, then the large pores can easily become plugged by foulants. In that case the transmembrane pressure rises rapidly, and it's not easy for the filter to recover. In our pilot testing, we have observed that because of tight pore size distribution, our membranes don't need aggressive chemical cleans. That translates into less maintenance and chemical cost savings for users.

GPD: Do higher-solids feedwater streams require more frequent backwashing?

Singh: Yes. The backwash frequency is a function of the feedwater solids content. The typical back-pulse interval ranges from 20 or 25 minutes for waters very high in solids, to 50 or 60 minutes for waters very low in solids. Backwash frequency is adjusted automatically based on transmembrane pressure.

tpo: Is this technology best suited to utilities of a particular size range? **Singh:** These membrane systems are very modular. The standard, preengineered systems start as small as 0.1 mgd and go up 2 mgd per skid. Multiple skids can be used depending on the size of the overall system. We are pursuing jobs with flows all the way up to 50 to 70 mgd. **tpo**



Revenue by the Truckload

A PENNSYLVANIA TREATMENT FACILITY HELPS MAKE UP FOR INCOME LOST WITH INDUSTRIAL PLANT CLOSINGS BY INSTALLING AN EFFICIENT RECEIVING FACILITY FOR SEPTAGE, GREASE AND SLUDGES

By Ted J. Rulseh

ver the years, the Delaware County Regional Water Quality Control Authority (DELCORA) lost wastewater flow and revenue as major industries closed down or curtailed operations.

The choice then was clear: find new sources of revenue or be forced to load more capital and operating costs on remaining ratepayers, including homeowners. The agency, based in Chester, Pa., chose to help rebuild its revenue stream by greatly expanding its trucked waste business.

Today, that business generates millions in revenue at the authority's 50 mgd (design) activated sludge treatment plant. It's a sophisticated operation built around a facility designed to be efficient and hauler-friendly. There are lessons in the authority's experience that could benefit other clean-water agencies that have potential to build significant business accepting hauled-in materials.

Chris Lenton, human resources specialist and leader of the agency's Trucked Waste Team, and Mike DiSantis, the authority's director of operations and maintenance, talked about the program in an interview with *Treatment Plant Operator*.

CPO: What was the impetus behind raising the profile of the trucked waste business?

DiSantis: When this plant was originally built, it had more industrial than residential flow. One oil refinery and one paper mill alone comprised more than 28 mgd, and there were other industries, as well. Then, as has happened in other industrial areas in the Northeast, those flows declined. At the end of 2012, an oil refinery closed suddenly, taking away 6 mgd of wastewater that we used to treat. The paper mill at one time had 11 paper

We formed a cross-functional business team that includes representatives from accounting, customer service, engineering, O&M and laboratory. We sat down and created a business plan and then went out and implemented it." MIKE DISANTIS

machines and was sending 15 mgd; they are down to three paper machines and send us 4 mgd.

Because in terms of residential development this area is pretty much grown out, we had to find new ways to replace that lost revenue, or our remaining ratepayers would have to cover all of our fixed operating expenses, plus all the capital costs required to keep a 40-year-old facility going. The revenue stream from trucked waste helps offset that.



Business team members for the trucked waste receiving facility at DELCORA are, from left, Barbara Bonnett, Harry Bordley, Bernadette Bohn, Debbie Zetusky, Joe Centrone, John Berry, Chris Lenton, Ian Piro, Mike Cherico, Robert Powell and Mike DiSantis. Not pictured: Mark Dorrin Jr. and Dan Dutton.

CDISANTIS: Ten years ago, the trucked waste business? **DISANTIS:** Ten years ago, the trucked waste business was languishing. We had a business, but no one was doing much to promote it or to help meet the needs of our hauler customers. We recognized that we were under-loaded at an average flow of about 28 mgd. We saw that we could definitely take in more waste and use that revenue to offset operating expenses without major additions to the staff.

We formed a cross-functional business team that includes representatives from accounting, customer service, engineering, O&M and laboratory.

We sat down and created a business plan and then went out and implemented it.

CpO: What happened to the trucked waste business volume as a result of the business plan?

DiSantis: The business started growing rapidly. We didn't have to lower prices, and we didn't have to make any drastic changes to what was already in place. At the end of 2004, we saw about \$280,000 in gross revenue from trucked waste. In 2005, which was the first full year we went at it full-speed, we jumped to more than \$800,000.

Paying closer attention to customer service and promoting the business really made a difference. The team kept evolving. We procured a customized software program to handle billing for the trucked waste business. We developed truck routes to help the customers. We offered incentives such as discounts to haulers. We provided a contact list so they could call us and get assistance with how to permit their wastes and their trucks. We made it easier for the haulers and waste generators and showed them that we were here to service their needs. Last year, in 2013, we received \$3.6 million in trucked waste revenue.

tpo: How large is your service territory for trucked waste?

Lenton: We receive material from Pennsylvania, New Jersey, Delaware and Maryland. One customer occasionally comes up from Virginia.

DiSantis: We have a great location, right off Interstate 95. I'd say the majority of the waste comes from a 60- to 70-mile radius around us.

tpo: What led to the creation of the new receiving facility?

DiSantis: We recognized about two years ago that we needed to upgrade the receiving facility. We had three receiving areas in the plant, for receiving trap grease and restaurant grease, for industrial and municipal sludges, and for all the other wastes — septage, industrial wastewater, holding tank waste, food processing waste and others.



The trucked waste facility is designed for truck drivers' convenience. A drivethru configuration saves time.

We had seven ports piped in above ground. Once the haulers came in with their rigs, they had to sit in a queue, and then when it was their turn they had to back up into a spot. We came up with the idea of a facility that would look like the fuel islands at a giant truck stop. Haulers would pull in, unload and drive straight out — there would be no backing up. Any size truck would fit, whether a tractor-trailer, a 10-wheeler or even a small six-wheeler.

We built a 10-bay receiving facility that allows our customers to unload a tractor-trailer in seven minutes. In the past we had been running upward of 20 minutes to get some trucks out of here, and time is money to the haulers — they want to go in and out. When we opened the new facility last January, we got resounding feedback on how much they appreciated it.

tpo: How exactly do the trucks empty their loads?

DiSantis: We have a pump station at that end of the plant. We built a collection manifold that goes right into that pump station, which delivers the waste to the head of the plant. All they have to do is connect a 4-inch quick-connect hose, open a valve and they're unloading. At each connection there's lighting, and they have water to wash down their hose. Everything is heat-traced for winter operation. We're doing another upgrade to our grease receiving area. Today, drivers have to pressurize to unload. In the new area, they will be able to unload by gravity, which is a big deal. That's the kind of improvement our business team works on continuously.

Lenton: Every load is manifested and sampled. We have a pretty tight monitoring program. Before a truck is allowed to unload, the driver comes into our receiving area, gives the receiver a manifest, takes a sample cup,

We had a basic design, but we sought the haulers' input. As we developed the project, we were constantly in contact with the haulers to get their ideas on what they wanted in the design, what their wish lists were, what would make their jobs easier." CHRIS LENTON

and goes out and gets a sample of the load from a sample port for testing. All manifests we receive from haulers are put into our Sludge Accounting System by the receiver. That information is uploaded to accounts payable.

GPO: What else has been done to make it easy for haulers to do business with DELCORA?

DiSantis: It doesn't cost anything to become a permitted hauler here. They just have to show proof of insurance, provide a list of all their equipment and sign an agreement with us to follow our rules and regulations. The permitting process can be completed in one or two business days.

tpo: What volume of trucked waste do you receive?

DiSantis: We average about 500,000 gallons per day, or about 15 million gallons a month, counting all three kinds of wastes. That's about 180 million gallons a year.

GPO: How is all this waste handled so that the core treatment process is not upset?

DiSantis: Our aeration process is automated. It works off dissolved oxygen control that regulates the blowers to control the air header pressure. The aeration system just reacts to the waste load automatically. Of course, of the 500,000 gallons per day, not all of it goes into the process. The municipal and industrial sludges are about 100,000 gallons a day, and the grease accounts for another 100,000 gallons per day. Those wastes go directly to solids handling. So that leaves about 300,000 gallons a day going through the plant, against a total flow today of 36 mgd. So the trucked waste is really a small percentage of the flow.

LDO: What happens to the solids stream?

DiSantis: The trucked grease and sludges and the sludges from our process are first thickened on gravity belt thickeners. Then the material goes to belt filter presses for dewatering. The resulting cake at 28 percent solids is incinerated. *(continued)*

The team members are the greatest resource at this plant. They know it. They've been here forever. They do the work. I'm support staff. I coordinate what they do, and the best way for me to do that is to listen to what they have to say."

Nate Tillis Operations and maintenance supervisor Beloit (Wis.) Water Pollution Control Treatment Facility

201

The greatest natural resource.

tpomag.com

tpo: Did customers have input to the design of the receiving facility?

Lenton: We had a basic design, but we sought the haulers' input. As we developed the project, we were constantly in contact with the haulers to get their ideas on what they wanted in the design, what their wish lists were, what would make their jobs easier. We even had one hauler who lent us one of his trucks and a driver to put the facility through the paces on a Sunday, before we finalized the design. We listened, and we couldn't be happier with the finished product. And the haulers are singing the praises of it.

tpo: How did you go about getting the haulers' feedback?

Lenton: It was a combination of small group and individual discussions. The haulers pretty much come in on a daily basis, so we had formed good working relationships with them. They feel pretty free to give us their unbiased opinions about whether something is good or bad.

CPO: What kind of outreach did you undertake to attract new customers and expand the business?

Lenton: Word of mouth played a big part. Once they found out about our pricing and our customer service, business started multiplying. The main catalyst was Mike DiSantis. He had been in this business for a long time and had a large number of contacts made over the years working at different facilities. With the relationships he had, word spread fast.

DiSantis: Our business team decided that we should be attending conferences including the state and regional Water Environment Associations, the state Rural Water Associations and the Pennsylvania Septage Management Association. Some we attended once, some we attended a few times. That raised our profile and got people talking about us.

tpo: What steps do you take to sustain the business?

DiSantis: I can't say enough about how important the relationships are. Many of the people on our team have built relationships with the customers, and that makes a difference.

Lenton: We hold hauler appreciation days, and we have a dinner once a year for the principals. That way they can meet all the people on the team and put faces with the names. We do things like that to keep the relationships fresh and on a social as well as professional basis. Customers seem to like that.

LPO: What advice would you give to other entities that might want to expand their trucked waste business?

DiSantis: You have to recognize that it's a business and treat it like a business. Unfortunately, many municipalities I've seen act as if they're doing the haulers a favor, instead of the other way around. You also need to have precautions in place to protect your facility — to make sure you don't receive anything you shouldn't receive, or take in a waste that you can't handle. You need a really good system of checks and balances. **tpo**

I believe plants must offer tours and interact with the public. Water is grossly underappreciated and unvalued in our country. Part of the plant operator's job is to elevate the public's understanding and appreciation."

> Greg Swanson, Utilities General Manager, City of Moline, III.

Pride. It speaks volumes.

Hear what operators like Greg have to say each month in *Treatment Plant Operator*.

FREE subscription at www.tpomag.com



Contact us for all your Rental or Purchase Needs: Phone (800) 468-2657, Email: sales@deltank.com 436 Hwy 93 N, Scott LA 70583 Other Products Available: Tank Manufacturing, Integrated Tank Systems, Vertical Tanks, Agitators, 3 and 4 Panel DELineator Shakers



- Each agitator custom designed for the application.
- · Complete system with controls.

Walker Process Equipment www.walker-process.com





Monitor and document application with Digi-Star Nutrient Tracker ™ and GPS
 Consistent, even spreading of a broad range of solid and dry, flowable material







Call today for information on our industrial spreaders and mixers Kuhn North America • Brodhead, WI • 608-897-2131 • KuhnNorthAmerica.com

Tanks, Structures and Components

By Craig Mandli

Baffles/Booms/Weirs

LIGHTWEIGHT BERM

Patriot Berms from Husky Portable Containment have separate aluminum angle pieces that make the berm liner lighter to handle and easy to use with minimal setup. The angle brackets come in their own storage bag, as does the berm



Patriot Berms from Husky Portable Containment

liner, making transport easy. Material options include PVCs from 22 to 30 ounces, all XR materials and urethanes, with wall sizes up to 24 inches. The aluminum angles are constructed from heavy-duty 6061-T6 aircraft-quality aluminum. **800/260-9950; www.huskyportable.com**.

Bins/Hoppers/Silos



Dry bulk storage silos

from Imperial Industries

DRY BULK STORAGE SILO

Welded, one-piece, dry bulk storage silos from Imperial Industries can be customized. Bulk silos and tanks need minimal maintenance and save material-handling costs over many years of use. Tanks are available in carbon steel, stainless steel and aluminum, in silo diameters to 16 feet, and in capacities to 12,000 cubic feet. Paint finishes per

the Imperial standard or customer paint specifications are available on carbon steel silos. Standard guardrail and ladder assemblies in aluminum, carbon steel and galvanized steel ensure easy assembly and maintenance-free durability. **800/558-2945; www.imperialind.com**.

FABRIC BUILDING

Fabric buildings on a rigid steel frame from Legacy Building Solutions provide a corrosion-proof environment for biosolids drying and dewatering. Buildings are custom engineered, and clear span designs are available over 300 feet wide. Hanging loads such as fire suppression systems, odor control hoods and conveyors can



Fabric buildings from Legacy Building Solutions

be suspended from the building frame, and the engineering meets or exceeds local codes related to environmental loads. Available ventilation options include eave ventilation, open ridge vents, mesh vents or walls and intake/exhaust fans at the peak. **320/259-7126; www.legacy buildingsolutions.com.**

FIBERGLASS BASINS AND WET WELLS

Industrial fiberglass basins and wet wells manufactured by Orenco Systems provide long-lasting, low-maintenance bulk storage for wastewater, potable water and process applications. These lightweight vessels



are corrosion-resistant and have long service lives. Helically wound vertical or horizontal basins are available in sizes up to 250,000 gallons. Underground wet wells range from 2 to 24 feet in diameter. The base and top of each unit are produced via vacuum infusion incorporating high-strength fabrics. They can be shipped as single units or in sections stacked and assembled on site. Por-

Fiberglass basins and wet wells by Orenco Systems

table and above-ground units can be equipped with easily deployed walkways, ladders and railings. One-piece, vacuum-infused, fully insulated rectangular fiberglass tanks are also available in sizes up to 15,000 gallons and can be installed either above or below ground. **800/348-9843;** www.orenco.com.

CHEMICAL STORAGE, DISCHARGE AND FEED SYSTEM

Turnkey bulk storage, discharge and feed systems from Sodimate incorporate a mechanical unloader that discharges to storage containers such as silos, hoppers and bags using rotating flexible blades that prevent bridging and clogging. Typical materials

handled include lime, soda ash and pow-

dered activated carbon. 773/665-8800:



Storage, discharge and feed systems from Sodimate



www.sodimate-inc.com.

BIN ACTIVATOR

The BA Bin Activator from WAM USA uses its tapered conical shape with vibration to facilitate material flow from hoppers or silos. It consists of a seamless carbon or stainless-steel cone manufactured on a

BA Bin Activator from WAM USA

sheet metal lathe, a seamless SINT engineering polymer seal with integrated upper and lower flange, suspensions for connection with the silo and one or two electric vibrators. It is available with a range of seals, including an FDA-approved food-grade version and high-temperature version, and with a wide range of baffle plates. Units offer low power requirements and durable suspensions and seals. **770/339-6767; www.waminc.com.**

Boilers/Heaters

CONDENSING HOT-WATER BOILER

The TC Series condensing hot-water boiler from Parker Boiler Co. is available in sizes from 399,000 up to 5,443,000 Btu input, with stainless-steel construction for resistance to corrosion at low operat-

ing temperatures. It offers efficiencies to 99.7 percent that have been witnessed and verified by a Nationally



TC Series condensing hot-water boiler from Parker Boiler Co.

Recognized Test Lab. Units are available with conventional gas burners or low NOx power-type burners and ETL listed as complete "Gas Fired Boiler Assemblies" per UL 795. Units under 2.0 MM BtuH input are SCAQMD 1146.2 certified. **323/727-9800; www.parkerboiler.com.**

Clarifiers

LAMELLA PLATE CLARIFIER

Concrete and stainless-steel lamella plate clarifiers from Ecologix Environmental Systems treat 300 gpm. The design includes both flash



and slow mixing zones before the lamella platesettling zone. The addition of a chemical coagulant in these zones allows for extra phosphorus and turbidity removal when required. All structural and wetted components are fabricated from stainless steel, while the plates are high-density

Lamella plate clarifiers from Ecologix Environmental Systems

polyethylene. The conical bottom provides a solids concentration zone for efficient removal and recycling of con-

centrated solids via airlift pumps. A fully covered walkway above the clarifier enables easy access to the plates below. **888/326-2020; www. ecologixsystems.com.**

VERSATILE CLARIFIER

Hi-Tech clarifiers from Kusters Water, division of Kusters Zima Corp., can be used in nearly any sedimentation and thickening application. Various styles of collectors

and drives are provided to meet job-specific requirements. **205/987-8976; www. kusterswater.com.**



Hi-Tech clarifiers from Kusters Water, division of Kusters Zima Corp.



PERIPHERAL-FEED CLARIFIER

The peripheral-feed, center take-off Spiraflo Clarifier from Lakeside Equipment Corporation takes in influent in the periphery of the tank. The flow moves to the center for removal by a centrally located effluent trough. Comparative tests show that the clarifier approaches or equals the results of quiescent settling,

while improving efficiency. 630/837-5640;

www.lakeside-equipment.com.

Spiraflo Clarifier from Lakeside Equipment Corporation

PERIPHERAL DRIVE CLARIFIER

Peripheral Drive Clarifiers from Schreiber use leverage rather than center-drive torque to rotate the scraper and skimming assembly, resulting in a simplified mechanical system. All equipment for continuous removal of



Peripheral Drive Clarifiers from Schreiber

floatables and settled solids is suspended from a rotating bridge or, for smaller units, a lightweight rotating beam arm. The skimming equipment removes floatables regardless of wind direction, and helical scrapers transport settled solids to the center of the basin in a single revolution. Equipment can be lifted above the water level for inspection or maintenance without dewatering the basin. **205/655-7466; www.schreiberwater.com**.



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

HIGH-RATE SOLIDS CONTACT CLARIFIER

The CLAR-I-VATOR high-rate solids contact clarifier from Smith & Loveless provides economical and efficient chemical precipitation. It combines flash mixing, flocculation, clarification, sludge collection and thickening in one-unit operation. Pre-engineered designs include cir-

cular clarifiers, center and peripheral feed systems, parallel plate separators, solids contact clarifiers, thickeners and rectangular scraper systems. Diameters range from 10 to more than 100 feet, with half-bridge and full configurations. Tank design options consist of concrete, mild steel, stainless steel and nonmetallic. **800/898-9122; www. smithandloveless.com.**

RENTAL CLARIFIER

Rental clarifiers from UniPure have two axis-adjustable support arms that enable the drop-in unit to perform. The operating height of the unit can be adjusted to accommodate less than ideal site conditions. The adjustable width on the support arms allows the unit to work with any frac tank, saving time



Rental clarifiers from UniPure

and money in the field. Rental clarifiers are available throughout the U.S. 877/864-7873; www.unipure.com.

CLARIFIER MECHANISM

Clarifier mechanisms from Walker Process Equipment, A Division of McNish Corp., are available from the most basic type of bridge or pier supported to those with the most complex and demanding requirements. Specialized modifications include seismic design, special materials of construction, deflection-limited design and custom features to suit existing infrastructure. Nearly every component



Clarifier mechanisms from Walker Process Equipment, A Division of McNish Corp. is modifiable, including the bridge and superstructure, influent arrangement, sludge removal method of plowing with spiral or conventional flights, rapid (hydraulic) sludge removal systems and many types of skimming options. Drives are made with corrosionresistant cast-iron housings and

precision gearing and bearings that have a proven life span of over 50 years. **630/892-7921; www.walker-process.com.**

Clarifier/Digester/Tank Cleaning

SLUDGE SCRAPER

The ZICKERT Shark sludge scraper from WesTech Engineering is based on the forward and return movement of sections. The concave faces of the sections transport the sediment toward a biosolids pit. During the return movement, the wedge-shaped parts of the sections slide under the sludge blanket, providing continuous and uninterrupted transport. The system has few moving parts, can

be powered by hydraulic or electric motors, and operates whether it is pulled or pushed, offering flexibility when locating the drive. It is simple to install and easy to maintain, leaves no dead zones and doesn't create turbulence. **801/265-1000; www.** westech-inc.com.



ZICKERT Shark sludge scraper from WesTech Engineering

Coatings and Linings

ROTOLINING POWDER FOR INDUSTRIAL EQUIPMENT

Fluon ETFE powders from AGC Chemicals are melt processable copolymers of tetrafluoroethylye and ethylene, that are ideal for

product focus

Tanks, Structures and Components

seamless rotolining of industrial equipment used in chemical processing applications. The free-flowing ETFE powder naturally conforms to interiors and does not typically require welding and sealing. The powder possesses outstanding physical toughness and is highly resistant to heat and chemical attack with excellent bonding to metal. Features include



from AGC Chemicals

seamless interior lining of intricate and complex shapes of varying size with a uniform desired thickness, allowing for post machining of critical surfaces. They can also create a lining thickness up to 0.25 inch using a mold-free process. Electrostatic coatings are also available. 800/424-7833; www.agcchem.com.



CORROSION-RESISTANT TANK LINER

DuraChem 580 corrosion-resistant tank liner from AmTech Tank Lining & Repair protects the tank substrate from corrosive degradation. For-

DuraChem 580 tank liner from AmTech Tank Lining & Repair

mulated to resist the liquids and gases found in wastewater streams, it is a 100 percent solids tank lining with adhesion

characteristics up to 1,000 psi. Applied at a high temperature, it cures instantly, bonding to tank substrates and minimizing operational downtime, extending the life of new or existing vessels. It contains no VOCs. 888/839-0373; www.amtechtanklining.com.

FAST-DRYING EPOXY COATING

Fast-curing, 100 percent solids SherPlate PW Epoxy tank lining from Sherwin-Williams is designed for potable water applications. It provides enhanced edge retention, improving corrosion protection on corners and sharp angles. It can be applied in one coat, has a

24-hour return-to-service time, and meets AWWA D102 and AWWA C210 standards. It becomes dry to



walk on in three to four hours at temperatures of 77 degrees F, allowing for quicker inspection times. Assets can be placed into immersion service in just 24 hours. The coating is recommended for use on steel or concrete for potable water pipes 6 inches and larger, and tanks greater than 25 gallons. It is also acceptable for use with cathodic protection systems. It is available with OPTI-CHECK OAP Technology to quickly identify pinholes or verify film thickness to ensure proper application. 800/524-5979; www.sherwin.com/protective.

Covers/Domes



Defender tank covers from Environetics

ODOR-CONTROL TANK COVER

Defender tank covers from Environetics are custom manufactured from industrialgrade materials to fit the profile of new or existing wastewater treatment or potable water tanks. Odor-control covers contain volatile organic compounds at the source. Low-profile structurally supported covers

minimize emission treatment volume to reduce the cost of air filtration equipment. 815/838-8331; www.environeticsinc.com.

MODULAR COVER

Modular covers from Geomembrane Technologies (GTI) provide effective odor and algae control and thermal protection. By covering the surface with a modular cover, the effects of wind and sunlight are reduced. Gases are held in suspension beneath the cover, limiting the emission of foul odors and the growth of algae. Because modular covers float, water level fluctuations can



Modular covers from Geomembrane **Technologies (GTI)**

be accommodated. The covers' flexible and buoyant design allows workers to safely walk on them. Cover panels can be opened or removed for basin cleaning and other maintenance. They are constructed with durable polyethylene materials and are designed to resist damage from chemicals, environmental exposure and UV rays. They are custom designed to meet unique project requirements and are suited for both aerated and nonaerated systems. 855/484-4630; www.gticovers.com.

Grating/Handrails/Ladders



ALUMINUM SAFETY RAILINGS

Kee Lite aluminum safety railings from Kee Safety combine corrosion resistance with an aesthetic design. They are OSHA-compliant, as the top railings can withstand a 200-pound load applied at any point from any direction. Railings are easy to install with simple tools. Constructed of aluminum silicon magnesium alloy

Kee Lite aluminum safety railings from Kee Safety

(A356-T6), the railings provide a durable, low-maintenance alternative to fabricated structures. Large, recessed set screws provide an attractive appearance and resist thread stripping. They are available for

use with Schedule 40 pipe in sizes from 1 to 2 inches. 800/851-5181; www. keesafety.com.

Media

MOVING BED BIOFILM REACTOR

The Veolia ANITA Mox moving bed biofilm reactor from Kruger USA can be used to treat wastewater streams with high ammonia concentrations. Sidestreams from dewatering of anaerobically digested sludge are



Veolia ANITA Mox moving bed biofilm reactor from **Kruger USA**

well-suited for the process. It can remove nitrogen from streams with only 40 percent of the aeration demand of conventional nitrification, and without supplemental carbon. This saves operating costs and reduces ammonia load and load swings on the main plant. A continuous aeration control method creates the necessary conditions for ammonia oxidizing bacteria and anammox bacteria to operate simultaneously in the biofilm of a single-stage reactor. 919/677-8310; www.krugerusa.com.



TankScan TSM8000 tank level

monitoring system from ATEK

Access Technologies LLC

Tank Inspection/Repair

LIQUID TANK MONITOR

The TankScan TSM8000 tank level monitoring system from ATEK Access Technologies LLC sends fluid level data to a central gateway that can be viewed

> remotely using any Internet-connected device. It optimizes the distribution and collection processes by ensuring that

trucks are deployed efficiently, eliminating runouts and reducing excess inventory. The device can accurately monitor fluid levels in multiple tanks across multiple sites from any computer. **800/523-6996; www.tankscan.com.**

Tanks



Tanks and containers from

Assmann Corporation of America

CORROSION- AND CHEMICAL-RESISTANT POLYETHYLENE TANKS

Corrosion- and chemical-resistant tanks and containers from Assmann Corporation of America are available in capacities up to 12,000 gallons. Constructed from

virgin high-density crosslink or FDA-compliant linear polyethylene, the tanks and containers store and transport corrosive and hazardous materials. They provide low-temperature impact resistance, are UV-stabilized, and come in a wide range of capacities and colors. Custom rotational molding, accessory fittings and custom colors are available. They have NSF certification to NSF/ANSI Standard 61: Drinking Water System Components – Health Effects. NSF-certified tanks include all models of vertical storage, cylindrical horizontal, free-standing horizontal leg, double wall, open top, industrial mini bulk and industrial mini drum tanks and models ICB and OTCB conical bottom storage tanks. **888/357-3181; www.assmann-usa.com.**

> POLYPROPYLENE STORAGE TANK

WIRE-WRAPPED PRESTRESSED CONCRETE TANK

Wire-wrapped prestressed concrete tanks from Caldwell Tanks are durable and require minimal maintenance, reducing both the cost of storage tank maintenance and downtime. High-quality Type II and Type III tanks are designed and constructed to meet AWWA D110 and ACI 372, and are customized to project requirements. **502/964-3361; www.** caldwelltanks.com.



Concrete tanks from Caldwell Tanks

Polypropylene storage tanks from C&E Plastics are corrosion resistant and

durable. Tanks are custom designed and come standard with a smooth interior design for easy cleaning, without compro-

mising strength and structure. 724/947-

4949; www.ceplastics.com.



Polypropylene storage tanks from C&E Plastics

WASTEWATER STORAGE TANKS

Prestressed concrete wastewater storage and process systems containment tanks from DN Tanks provide long-term service with minimal maintenance and downtime. Tanks are available for digesters, primary and secondary clarifiers, solids storage and equalization. **800/227-8181;** www.dntanks.com.



Concrete storage and containment tanks from DN Tanks

(continued)

Dewatering Made Simple





Trailer Mounted Sludge Mate®

Roll-Off Sludge Mate®





-

Low Profile Roll-Off Self-Dumping Hopper

ing Hopper Poly-Mate®



CORPORATION

STANDARD CIRCULAR CLARIFIER DRIVES

Available 4 Weeks From Order

Aurora, IL USA www.mcnishcorp.com



One-Piece Welded Construction up to 16' Diameter

- Optional Systems Completed at Imperial
- ASME Certified per Section VIII, Division 1
- The "Polane" Urethane" Protection Process
- Field Welded Tanks Quoted Upon Request
- Customers' Choice for Quality, Service and Value



THE PROUD TRADITION CONTINUES...



CUSTOMERS CHOICE FOR LIQUID STORAGE TANKS/SILOS



407/412 D.O.T INDUSTRIAL WASTE TANKS 800-558-2945 • www.imperialind.com



product focus

Tanks, Structures and Components

VACUUM TRAILER

Aluminum and stainless-steel vacuum trailers from Mid-State Tank Co. come with stainless-steel suspension subframes, Hendrickson air-ride suspensions, optional lift axles,



50,000-pound landing gear, outlets as required, float level gauge or sight glass, storage cabinets, full lights and work lights. **800/722-8384; www.midstatetank.com.**



Steel storage tanks from Superior Tank Co.

BOLTED STEEL STORAGE TANK

Bolted steel storage tanks from Superior Tank Co. are designed for stormwater collection and the stor-

age of water for pretreatment. They use a durable 3M Scotchkote powder coating formulated

for corrosive environments. They are available in capacities from 10,000 to 3 million gallons and comply with AWWA and NSF standards. Open-top and closed-roof designs are available, as are specialized appurtenances. The bolt-together design is quick to assemble and eliminates welding and on-site painting. **877/974-4438; www. superiortank.com.**

ROLLED, TAPERED PANEL TANK

RTP (rolled, tapered panel) tanks from Tank Connection Affiliate Group come with durable LIQ Fusion 7000 FBETM factoryapplied coating, making suitable replacements for field-weld tank



RTP tanks from Tank Connection Affiliate Group

construction. The company offers single tank or integrated storage systems. **620/423-3010; www.tankconnection.com.**



BOLTED STEEL TANK

Smooth-wall bolted steel tanks from United Industries Group offer flexibility and secure leak protection. The RTP (rolled, tapered panel) construction eliminates leakage. Bolted tanks are available in a variety of coatings, glass-fused-tosteel, epoxy coated or stainless steel, providing

Steel tanks from United Industries Group corrosion resistance to a wide range of liquids. They can hold materials in the millions of gallons and can be designed

for heavy liquid storage, high wind, heavy snow loads or high seismic requirements. They provide for size flexibility, ease of installation and long life span. **949/759-3200; www.unitedind.com. tpo**

New & Used Equipment
Free Subscription
Digital Editions

ent Conline Exclusives Editor's Blog www.tpomag.com



Now featuring ROBUSCHI by Gardner Denver

Helical Lobe, Rotary Screw, and High-Efficiency Blower Packages Ideal for: Aerobic Digestion, Grit Aeration, Sludge Digestion, Filter Backwash, Channel Aeration

Come see us at WEFTEC booth #7117

www.gardnerdenver.com

©2014 Gardner Denver. All rights reserved.

Gardner

Denver

Lone Worker Safety Systems

Concerned about lone worker safety? Have peace of mind! Grace Industries emergency signaling 'man-down' alarms & monitoring systems locate your workers in an emergency. Our safety solutions range from portable, worker worn devices to fixed-mount alerting systems perfect for any size facility.

> Wefted 2014 Booth 1135

- Easy to Use
- Intrinsically-Safe
- No Monthly fees
- Rugged and Reliable
- Waterproof
- Modular Design



Phone 724-962-9231 sales@graceindustries.com www.graceindustries.com Every Worker Should

Feel Safe On Th

By Craig Mandli

Structured-sheet media helps meet strict nitrification standards

Problem

The City of Stockton, Calif., needed to upgrade its 55 mgd wastewater treatment plant to meet NPDES regulations for tertiary treatment. The goal was a reliable, economical technology that would achieve tertiary nitrification, especially during winter. Because of the plant's location, seismic hazards had to be considered.

Solution

After a comprehensive evaluation, nitrifying trickling filters were selected based on low energy consumption, process stability and operational simplicity. **High-density structured-sheet media** from **Brentwood Industries** proved cost-effective for achieving optimal nitrification. The media modules yield a high specific surface area and are built to a tight deflection stan-



dard of 1 percent, allowing maximum treatment capacity within a small footprint and meeting strength requirements. Two nitrifying towers were built, each 166 feet in diameter with a media depth of 22 feet. The towers began receiving effluent from oxidation ponds and engineered wetlands, designed to decrease solids loading and maintain stable ammonia loading. From there, effluent was discharged to a dissolved air flotation tank and tertiary filter for polishing.

RESULT

The trickling filter installation allowed the plant to maintain an ammonia removal rate consistently in excess of 94 percent, meeting the required ammonia discharge permit of 2 mg/L. **610/374-5109; www. brentwoodindustries.com.**

Fabric building provides efficient sludge bed cover

Problem

In the past 10 years the population of the Village of Huntley, Ill., has increased from 6,000 to more than 23,000. The village uses two activated sludge wastewater treatment plants, where solids are processed and dewatered. Without covered storage space, the material was stored in beds exposed to the elements. "We get charged by the cubic yard," says utilities superintendent Steve Zonta. "By storing it without cover, it would get rained on and grow in mass."

Solution

The team chose a **Hercules Truss Arch Building.** "I saw a **ClearSpan** catalog, spoke to a truss arch sales specialist, and realized that a fabric structure would be a cost-effective way to solve our problem," says Adrian Pino, chief wastewater operator.



"We already had a wood structure with a metal roof at the East Wastewater Treatment Plant, and the structure we chose came in at less than a third of what the other structure cost."

RESULT

With a 77- by 96-foot building, the village can now store up to 13,000 cubic yards of material under cover. "The warranty and the fact that the building could be engineered to specific snow and wind loads were important," says Pino. "It proved that this wasn't going to be just a temporary solution." **866/643-1010; www.clearspan.com.**

Bolted tanks provide storage solution for Oklahoma town

Problem

Steady population growth in Monkey Island, Okla., put a strain on the water treatment plant as it struggled to meet demand and new federal regulations. The Grand Lake Public Works Authority commissioned a newer, more efficient system that would pump water from six freshwater wells into storage tanks.

Solution

The utility, which serves 1,400 residential and 200 commercial customers,

awarded the project to Texas Aquastore and **CST Industries.** They installed a 500,000-gallon **HydroTec tank** constructed of panels overlapped and bolted into place to prevent leakage. Systems are manufactured in ISO 9001:2008 certified facilities. To ensure no leakage, each panel is dry-powder epoxy coated using an Opti-Bond Coating System. A performance urethane is applied to the exterior to extend gloss and color retention. The tank was installed from the top down using jacks, so no high scaffolding was required.



RESULT

Installation took less than two weeks. The cutover to the new water treatment plant will be completed by spring 2015. "When they said, 'Your tank's here,' I went out and looked and saw these boxes," says Jim Anderson, manager of the authority. "I was amazed at how they assembled the tank from the individual panels. There was no hassle, and the crew did a great job." **800/421-2788; www.cstindustries.com**.

Coating provides protection for iconic water tower

Problem

Turning an unimpressive elevated water storage tank in Silvis, Ill., into a landmark that resembles a golf ball on a tee was a logistical and creative challenge for the project's coating contractor, Jetco. The project aimed to elevate the city's profile as the site of the annual John Deere Classic golf tournament. Once the art was complete, it would need protection from the elements.
Custom Dewatering/Composting Solutions.



Groton NY WWTP Model 3012 DSP Screw Press

- Gravity Belt Thickeners
- Equipment Restoration
- Complete Compost Facility Design

BDP represented by:

MSD Environmental Dave Deaton

224 Linden Drive Centerville, OH 45459 **Bus:** (937) 313-9314 **Mobile:** (937) 313-9314 **Bus Fax:** (937) 438-5646 **E-mail:** msddaved@aol.com



Compact 0.9 m Model DDP Belt Press Great for small plants

- Belt Presses
- Screw Presses



Agitated and Aerated In-vessel type Composting System (ICS)

- Floor Level 3.0 m model 3DP No platforms or stairs required!
- Rotary Drum Concentrators
- On-Site Service & Mobile Demos



Visit us at Booth **#1709**

Sales: 518-527-5417 Factory: 518-695-6851 Fax: 518-695-5417 Email: kelly@bdpindustries.com



www.bdpindustries.com

Solution

The exterior artwork required experienced applicators to calculate the ratios and proportions of 4-foot-diameter circles shaded to resemble the dimples on a golf ball. Long-lasting, high-performance coating systems were specified to extend the project's maintenance cycle. A zinc-rich ure-



thane prime coat, a polyurethane intermediate coat and **Tnemec's Series V700 HydroFlon low-VOC fluoropolymer coating** provided UV light resistance and high color and gloss retention.

RESULT

Since its completion, the Silvis water tank has attracted extensive national and international media attention during coverage of the PGA golf event. It has also been featured on regional TV stations, CNN and in numerous newspaper and magazine articles, and it was voted a finalist in the 2013 Tnemec Tank of the Year contest. "I think it gives us an identity," says Silvis Mayor Tom Conrad. "It gives us a source of pride. We have something that no one else has." **800/863-6321; www.tnemec.com**.

Polyurethane coating stops hydrogen sulfide damage

Problem

Hydrogen sulfide corrosion was destroying the concrete tank walls at

the wastewater treatment facility in Altoona, Pa. A flexible, durable coating was needed to prevent further damage to the two 60- by 24.5- by 11-foot tanks, plus several additional square feet of old, pitted and rough concrete. The work had to be done in a confined space and in accordance with the facility's safety protocols.

Solution

Because a long-lasting coating with a smooth finish with high chemical resistance was important, the facility chose **Hi-Chem PW** from **Rhino Linings Corporation.** The elastomeric polyurethane formulation has a rapid cure time and good elongation properties and is NSF/ANSI 50 and 61 certified. Before installing the coating, the



concrete substrate was checked for chloride and pH levels. Next, a neutralizing solution was applied, and the surface was pressure-washed. Concrete gaps and bug holes were patched with a fast-curing polyurethane caulk, and the entire surface was coated with Rhino Primer 251 at 180 to 200 mils. Periodic thickness measurements were performed using ultrasonic and analog methods. Hi-Chem PW was applied at 250 mils to seal the walls and stop the damage.

RESULT

One tank was coated in November 2007, and the second in February 2009. Both are still operating with no corrosion issues. **800/422-2603; www.rhinoliningsindustrial.com.**

Application of coagulation principles overcomes clarifier startup issue

Problem

During the recent startup and commissioning of a new water treatment plant in Turkmenistan, the RO feed had high silt density index (SDI) values. The treatment process passed river water at 8 mgd through solids contact clarifiers, gravity filters, reverse osmosis (RO), and cation, anion and mixed-bed exchanger systems to supply water to a fertilizer plant. Leaders hypothesized that the very low TSS concentration did not allow charge destabilization via coagulation.

Solution

Doosan Hydro Technology solids-contact clarifiers, designed for 70 mg/L maximum TSS, were only seeing 6.0 mg/L. Using operating parameters defined by jar testing, the clarifiers were operated at an elevated pH of 9.5 to 10, with ferrous sulfate coagulant at 50 mg/L, polymer at 0.6 mg/L and an upstream chlorine



dose of 2.0 mg/L. However, the clarifier/gravity filter combination resulted in RO feed water with readings of 5.5 to 6 SDI, above the target of less than 4 SDI. Although the jar tests at the operating conditions indicated good TSS settling, the results could not be replicated by the clarifier/filter combination. Settling of TSS/colloids in the jar tests occurred due to sweep flocculation at a relatively high coagulant dose. The colloids were swept by coagulant metal oxides/hydroxides formed at high pH (and in presence of chlorine in this case to convert the ferrous-based coagulant to ferric). The sweep flocculation was likely not as effective in the relatively more turbulent clarifier conditions, and the excess hydroxide carryover fines deteriorated clarifier/filter performance.

RESULT

By reducing the coagulant dose to 20 mg/L and removing polymer altogether, the desired SDI goals were exceeded, with final SDI values of 1 to 2 after the filters. **813/549-0182; www.doosanhydro.com.**



Product improves total solids destruction in aerobic digester

Problem

The operators in an east-central Missouri city wanted better digester performance in the cold months. Colder months mean low volatile solids destruction and frozen soils that don't allow land application of biosolids. The team wanted better settling, increased decant and more space within the digesters.

Solution

After six months of trials, the operators discovered that **BIO ENERGIZER** from **Probiotic Solutions** could accelerate the rate of endogenous respiration by improving cell wall permeability, thus increasing biomass metabolism and reducing volume.



RESULT

The product created nearly 85 percent volatile solids destruction in 27 weeks and improved decants. It led to greater digester capacity, better settleability and decants, and better overall aerobic digester operation. **800/961-1220; www.probiotic.com.**

Compact, lightweight fiberglass baffles used for underground treatment

Problem

The Lima (Ohio) Wastewater Treatment Plant, a 33 mgd tertiary facility, needed to expand its capacity. One solution was to use a baffle wall system that would slow the flow of water, improving primary sedimentation. The installation would need to be completely underground.

Solution

Baffle wall panels were transported to their underground locations through 36-inch manholes to reach the primary clarifiers. Harrington Industrial Plastics recommended **Strongwell's FRP** due to its baffle panel size, high corrosion resistance against wastewater and shipment flexibility. The lightweight (6 1/2-



pound-per-foot), 24-inch baffle wall panels were easily transported through the manholes.

RESULT

Peterson Construction, the contractor, found the installation relatively easy without the use of cranes or other lifting equipment. EXTREN Series 500 12- by 6- by 1/2-inch I-beams and 3- by 3- by 3/8inch equal leg angles were also used as baffle supports. **276/645-8000;** www.strongwell.com. tpo



Want More Stories?

Get more news, information and features with our exclusive online content.

Check out Online Exclusives at

www.tpomag.com/online_exclusives







Register to attend the 2015 WWETT Show and you'll automatically be entered to win this Chevy 4x4!

Only \$35 by Nov. 14!

Register online at WWETT.COM

industry news

Quala adds wastewater to business offerings

Quala, provider of sustainable containers to the oil and gas industry, added commercial wastewater treatment and disposal to its business segments in Georgia, Louisiana, Pennsylvania and Washington with plans to open locations in North Carolina, Texas, Wisconsin and Alabama.

Headworks Bio sells marine division

Headworks Bio sold its Cleansea marine division advanced waste treatment technology to Evac Ov. The transaction will enable Headworks to concentrate on its core municipal and industrial wastewater treatment markets.

Calgon Carbon relocates headquarters

Calgon Carbon Corp. moved its headquarters to the Westpointe Corporate Center Four in Moon Township, Pa. Calgon Carbon will lease 75,566 square feet of the 130,000-square-foot building to house its executive staff, sales, service, and research and development departments. The company also opened its refurbishing facility in North Tonawanda, N.Y. The 12,500-square-foot building houses a dry feed system, screening tower, reactivation furnace, storage tanks and packaging system.

KOHLER completes 105,000-square-foot addition

KOHLER Power Systems completed a 105,000-square-foot addition to its generator manufacturing plant in Wisconsin. The addition expands storage for product parts and provides increased production capacity. The company also plans to add 300 workers in the next few years.

iWater joins Neptune partnership program

iWater joined Neptune Technology Group's Connected Utility Partnership Program, which provides shared, analyzed data across an array of utility applications.

Donahue begins term as AWWA president

John Donahue, chief executive officer of the North Park, Ill., Water District, began his term as president of the American Water Works Association. He follows AECOM senior consultant Jim Chaffee of Wisconsin as AWWA's top volunteer leader.

KROHNE offers electromagnetic flowmeter eLearning course

KROHNE introduced a three-module electromagnetic flowmeter eLearning course on its learning platform, Krohne Academy online. The first module covers the history and general areas of application, measuring principles and construction of an electromagnetic flowmeter. The second module includes sizing, measuring accuracy and calibration. The third module includes installation, grounding, limitations, advantages and applications. tpo

Dedicated to Wastewater & Water Treatment Professionals **FREE** subscription at: <u>www.tpomaq.com</u> icipal and utility maintenance professionals read it every month. A subscription is FREE

Visit mswmag.com

Your Full Line Tank Supplier



- Double Wall
 Vertical
 Horizontal
- Conical
 Secondary Containment
- Feed Stations
 Fork Liftable Containers
- Open Top
 Miscellaneous Tanks
- Accessories/Fittings









Fax: 888-TANK FAX (826-5329) E-mail: info@assmann-usa.com

in Garrett, IN and Marshall, TX





Complete Line of Chemical Feed Pumps, Systems and Accessories - Made in the USA

The 1700 Series is a heavy-duty. hydraulically actuated tubular diaphragm pump, designed for both high and low pressure applications up to 1640 gph.

- Handles inconsistent suction conditions
- Provides suction lift capabilities to 16 feet •
- Manual micrometer stroke length control
- Internal hydraulic relief valve to protect pump
- Easy maintenance cartridge type check valves
- Automatic stroke length control
- Internal back pressure valve
- **Diaphragm leak detection**
- AC or DC speed control



55 Bermar Park Phone: 585-426-0990 Rochester, NY 14624 USA Fax: 585-426-4025

E-Mail: mail@jescoamerica.com Internet: www.jescoamerica.com Toll Free: 1-800-554-2762

Total Metering Fluid Transfe Chem Feed

ment

Metering • Centrifugal • AOD • Chem Feed Systems • Measurement & Control • Accessories



1. MAGNETROL TRANSMITTER WITH FOUNDATION FIELDBUS

The Eclipse Model 706 guided wave radar transmitter with Foundation fieldbus digital output from Magnetrol is available with resource block, transducer blocks, analog input blocks, PID blocks, arithmetic block, input selector, signal characterizer block and integrator block. 800/624-8765; www.magnetrol.com.

2. BENTEK SYSTEMS SATELLITE MODEM

The SCADALink SAT100 satellite-based SCADA device from Bentek Systems provides modem, RTU and alarm callout functionality in a single unit. Features include four integrated I/O and RS232/RS485 serial ports for SCADA communication to RTUs, PLCs, flow computers and data loggers. 403/243-5135; www.scadalink.com.

ENDRESS+HAUSER LEVEL TRANSMITTER

The Deltabar FMD71 dP level transmitter from Endress+Hauser measures differential pressure without impulse lines and capillary tubes. The transmitter features two pressure sensor modules, each connected electronically to a single transmitter. Using a Ceraphire ceramic sensor in the pressure sensor modules, the transmitter calculates the differential pressure from both sensors and transmits the level, volume or mass via 4-20 mA with HART as a standard two-wire loop-powered device. One sensor module measures the hydrostatic pressure (HP) and the other measures the head pressure (LP). 888/363-7377; www.us.endress.com.

4. THOMAS & BETTS LED TUBULAR LIGHTING

The DTS XFFL range tubular LED fitting from Thomas & Betts has an operating life of 100,000 hours, output of 5,000 lumens with 100 percent yield and components mounted on a sliding gear tray to facilitate installation and maintenance. The lighting can be retrofitted into existing fixtures mounted with T8 lamps and is available in polycarbonate or glass. 901/252-5000; www.tnb.com.

5. OMEGA TEMPERATURE TRANSMITTERS

Programmable M12 RTD temperature transmitters from Omega Engineering feature M12 connection, 4-20 mA output and a temperature range of -58 to 248 degrees F (Tmax) and 176 degrees (electronic). The transmitter has a stainless-steel body, 0.12-inch diameter and probe lengths of 0.51 and 0.94 inches. 800/826-6342; www.omega.com.

KAESER COMPACT REFRIGERATED DRYERS

The Kryosec TAH-TCH series of refrigerated dryers from Kaeser Compressors handle flows from 12 to 159 cfm and provide drving at ambient temperatures up to 122 degrees F. The dryers have copperbrazed, stainless-steel plate heat exchangers and an Eco-Drain electronic demand condensation drain. 877/596-7138; www.kaeser.com.

7. PULSAFEEDER PRODUCT OR CODE

Product QR code from Pulsafeeder is available on the company's metering pump controller product information labels. Using a smartphone or tablet, specific model information can be scanned and emailed. The scan also can be used to access the Pulsafeeder website or contact a technical service representative. 800/333-6677; www.pulsatron.com.

8. VORTAB ELBOW FLOW CONDITIONER

The elbow flow conditioner from the Vortab Co. removes swirl and asymmetric velocity profiles caused by pumps placed too close to electromagnetic flowmeters. The conditioners are available in carbon steel, 316L stainless steel or Hastelloy C-276 as well as ANSI flanges, male NPT threads, butt welded preps or retaining wafers. 800/854-9959; www.vortab.com.

9. XYLEM ELECTROMAGNETIC FLOWMETER

The MagFlux EMF 801 electromagnetic flowmeter from Flygt - a Xylem Brand, delivers flow readings of 0.25 percent over the full range from 0.6 fps to 30 fps, even during flows as low as 0.6 fps in velocity. Fea-



tures include a full display menu with up to five lines of text and graphical display that can give an overview of wastewater flow. The display can be viewed in 26 languages. Each display unit can show up to four flowmeters and can be located up to 3,300 feet from the sensors. 855/995-4261; www.flygtus.com.

10. SURCO WATERLESS ODOR NEUTRALIZER

The Odomaster Series of waterless, ultra-dilutable concentrates from Surco Products are designed to neutralize target-specific processing odors produced by wastewater and other industrial operations. Featuring Metazene molecular odor neutralizer, malodors are neutralized and not masked. The concentrates are available in 5- and 55-gallon containers. 800/556-0111; www.surcopt.com.

11. BLUE-WHITE IN-LINE FLOWMETER

The Sonic-Pro S4 inline ultrasonic flowmeter from Blue-White Industries has no moving parts or internal liners to wear out. In-line pipe fittings facilitate meter installation. The meter is capable of measuring water flow using the Transit Time method. A low-power mode permits battery operation for limited functions. Optional data communication protocols include Industrial Ethernet, Modbus RTU, Modbus TCP, PROFI-BUS TPV1 and PROFINET. 714/893-8529; www.blue-white.com.

12. ELECTRONIC SYSTEMS CONTROL BOARD

The Model 110400 four-station water vending machine controller from Electronic Systems Design interfaces with any NAMA MDB payment device. The controller conforms to UL-508 and complies with CEI/IEC 1000-4-4 for EMI susceptibility. 888/326-0864; www.esdi.net.

(continued)

water: product spotlight

No-valve metering pumps reduce maintenance and chemical exposure

By Ed Wodalski

No-valve Odos chemical metering pumps from the Watson-Marlow Pumps Group deliver flow rates from 0.001 to 15 gph (0.1 to 1,000 mL/ min) at 100 psi (7 bar) while reducing maintenance by eliminating the pulsation dampener, diaphragm pump, float switch, backpressure valve, foot valve and strainer.

"Each component in any system requires maintenance," says Bill Schiller, district sales manager, Watson-Marlow Pumps Group. "When an ancillary item — be it foot valve, degassing head or backpressure valve — is eliminated, the maintenance time and cost is eliminated as well. Each of these ancillary items also has an install point that can leak, adding to the housekeeping and maintenance. This cost also is eliminated when you eliminate the component."

Designed as a drop-in replacement, the Qdos pump has a ReNu sealed pumphead that eliminates fluid leakage and operator exposure to chemicals.

"If a tube were to fail, an integral optical leak sensor turns off the pump and sends a fault signal to the control room, alerting the operator," Schiller savs.

Tool-free maintenance enables the pumphead cartridge to be replaced in less than five minutes without exposing personnel to hazardous chem-



Qdos chemical metering pumps from the Watson-Marlow **Pumps Group**

icals. Combined with fluid recovery functionality, the pumphead reduces chemical waste, delivering accurate and repeatable flows over a range of viscosities.

Pumps are available in manual (without analog or I/O signals), remote (runs only with 4-20 mA output, no manual option or backup) and universal models (4-20 mA analog input with open collector, 24VDC dry contact, and 110VAC-powered contact I/O options).

Options include the Universal+ for 4-20 mA output and scalable calibration and for fully digital control logic. All models are IP66 rated.

The pumps weigh from 9 to 11 pounds, depending on the model, and are 10 inches wide, 9.2 inches tall and 8.4 inches deep.

A 3.5-inch color display provides instant pump status and can be configured to display in nine languages. Advanced control features include fluid level monitoring, fluid recovery, line priming and intuitive flow calibration. 800/282-8823; www.wmpg.com.

product news



13. HONEYWELL FIRMFIT EARPLUGS

Howard Leight FirmFit earplugs from Honeywell provide effective 30 NRR dB hearing protection. The bright orange color offers high-visibility identification. The earplugs are available in corded and uncorded versions. **800/430-5490; www.howardleight.com/firmfit.**

14. MUELLER REMOTE PRESSURE MONITORING SYSTEM

The remote pressure monitoring system, part of the Intelligent Water Technology portfolio of products from Mueller Co., reports pressure data at customer-defined intervals via a machine-to-machine cellular-based service or a Mueller advanced metering infrastructure network. The Esri map interface can be viewed with a Web browser. Alerts are transmitted via SMS and/or email when customer settings for low- and high-pressure conditions are reached. **800/423-1323; www. muellercompany.com.**

15. LARSON PORTABLE LED WORK LIGHT

The WAL-TFM-200W-LED-100 portable LED work light from Larson Electronics produces 21,000 lumens of light while drawing 200 watts. The light provides 9,500 square feet of coverage. Not recommended for wet or damp environments, the lamp has a 16-inch light head mounted on a tubular frame pedestal fabricated from lightweight aluminum. **800/369-6671; www.magnalight.com.**

16. DETCON REMOTE NETWORKING GAS DETECTION

The Sentinel SiteWatch networking device from Detcon provides safety-critical information from gas and flame detection systems through Ethernet or cellular connections. The system provides email messaging with date and time stamp for all alarm and fault conditions. The Ethernet version includes a Web page that provides real-time viewing of detector type, serial number, location/name, gas concentration, gas type, alarm and fault status, along with battery life. SSL/TLS-based encryption provides communication security. **713/559-9200; www.detcon.com**.

wastewater: product spotlight

BigQ davit crane from QCEC Portable E-Z Turn davit crane requires less force to rotate load

By Ed Wodalski

The BigQ davit crane from QCEC features E-Z Turn technology that reduces the amount of force needed to rotate a loaded crane.

"What happens is most cranes get rusty and they're difficult to turn," says Jim Creighton, general manager for QCEC.

BigQ cranes ride on a bronze pin bushing and rotate within a Nyloil MDX sleeve. A fold-down boom handle provides added leverage.

Available in powder-coated carbon steel or T304 stainless steel for corrosion resistance, the B10 model can support up to 1,000 pounds while the A20 supports up to 2,000 pounds. Both cranes offer 360-degree rotation and four-position adjustable booms that can be raised or lowered while loaded.

Primarily used for lifting pumps out of wells in wastewater treatment plants, each crane can be quickly disassembled for transportation.

"You only pull a pump every three or six months, so with a portable crane you can put it in a truck and go from location to location," Creighton says.

The cranes are available with permanently installed floor-mounted pedestal bases, inverted bases that recess into concrete floors or sidewall brackets for industrial applications, as well as dolly-mounted pedestal bases for equipment loading.

When mounted in its HQ300 pedestal base, the A20 crane can be adjusted to provide maximum above-floor hook elevations ranging from 46 to 71 inches (28- to 45-inch reach), 47 to 80 inches (36- to 57-inch reach), 48 to 88 inches (45- to 69-inch reach) and 49 to 97 inches (53- to 81-inch reach). Using the HQ321 recessed base reduces those elevations by 14 inches, while the HQ361 dolly base increases them by 7 inches. With the HQ341 bracket, ranges depend on the height of the base relative to the floor.

The B10 crane, mounted in the HQ311 pedestal base, can be adjusted to provide maximum above-floor hook elevations ranging from 51 to 73 inches (23- to 36-inch reach), 51 to 80 inches (30- to 46-inch reach), 51 to 87 inches (37- to 56-inch reach) and 51 to 94 inches (44- to 66-inch reach). The HQ331 recessed base reduces those elevations by 14 inches, while the HQ371 dolly base increases them by 6 inches. With the HQ351 bracket, ranges depend on the height of the base relative to the floor.

Either crane can be equipped with manual or powered winches. The standard WQ100 manual lifting winch has a 2,000-pound maximum capacity and Weston brake mechanism that automatically engages when the handle is not being cranked. Constructed from carbon steel, the winch has a corrosion-resistant zinc dichromate finish and supports both cable quick-connection and carriage-bolted clamping. **800/959-0232; www.qcec.com.**



Koch Membrane Systems retrofits water treatment plant with TARGA II cartridges

Koch Membrane Systems started up the initial phase of its retrofit to the ultrafiltration system at the City of Del Rio, Texas water treatment plant. The full project is to be completed over the course of a year. The filters replace membrane cartridges that had reached end of life. Testing determined that a retrofit of TARGA II UF membranes could be implemented with minimal modification to the existing system and at reasonable cost.

Xylem to supply Flygt pumps to Europe's largest wastewater treatment plant

Xylem won a contract to supply its Flygt submersible pumps and monitoring and control technology as part of a project to upgrade Europe's largest (and the world's second largest) wastewater treatment plant near Paris. Xylem will supply 94 Flygt submersible column pumps, 32 centrifugal pumps, 15 pumps equipped with ejectors, and related accessories to recirculate, mix water and sludge feed the facility's biological tanks with wastewater. The Achères Seine Aval treatment plant handles about 400 mgd.

Project using Aqua-Aerobic Systems cloth filters wins engineering award

The CP&Y consulting firm received a National Grand Award from the American Council of Engineering Companies for work on the San Antonio Water System's Dos Rios Water Recycling Center Tertiary Filters Project. SAWS sought to double capacity and replace existing tertiary filters. To reduce costs, CP&Y adapted AquaDiamond cloth media filters from Aqua-Aerobic Systems into the existing structure, doubling capacity within the same footprint.

Echologics completes condition assessment of Boston transmission and distribution mains

Echologics completed a condition assessment survey of several distribution and transmission mains owned by Boston Water and Sewer Commission using its ePULSE noninvasive acoustic pipe condition assessment technology. The project included corrosion assessments of several largediameter steel mains and of ductile iron pipe in one neighborhood. The ePULSE solution measures the remaining average wall thickness of selected pipe segments and can simultaneously identify leaks. Municipalities can use the information to mitigate risks from deteriorating pipe walls, reduce nonrevenue water and prioritize repairs and replacement.

Gadsden dedicates North America's largest MIEX treatment facility

The Gadsden (Ala.) Water Works and Sanitary Sewer Board dedicated a new MIEX water pretreatment plant, the largest of its kind in North America. Named for the city's first water works manager, the C.B. Collier Water Treatment Plant uses the advanced MIEX process developed by Orica Watercare, which removes the organic precursors that lead to disinfection byproduct formation. The process has removed about two-thirds of the regulated compounds from the finished water, exceeding anticipated results. Flows average 10 to 12 mgd with capacity for 24 mgd. The excess capacity enables the city to support industrial growth.

Terratec awarded biosolids contract for Ontario Clean Water Agency

Terratec Environmental, a division of American Water's market-based subsidiary, American Water Enterprises, won a three-year contract from the Ontario Clean Water Agency for removal, haulage and utilization of biosolids. The \$200,000 contract includes removal and land application of biosolids from various wastewater treatment plants in the Ottawa Valley area.

CH2M HILL completes Wilsonville DBO water project on time and under budget

The City of Wilsonville, Ore., completed its new wastewater treatment plant under a \$42 million design-build-operation project by CH2M HILL. Work was completed ahead of schedule and under budget. The plant was rebuilt, upgraded and expanded to include modern treatment technology, a new odor system and increased capacity from 2.5 to 4 mgd, with expansion capabilities to 7 mgd. The upgrade included a headworks building and a biosolids dewatering and drying building to produce Class A biosolids. CH2M HILL took over plant operations in September 2011 and will operate it for the next 20 years.

Kruger installs system with ACTIFLO CARB, Hydrotech Discfilter and polymeric membranes

Kruger, part of Veolia Water Technologies, won a contract from the Harpeth Valley Utilities District in Nashville, Tenn., to furnish the water treatment plant with a 23 mgd ACTIFLO CARB system and two 23 mgd Hydrotech Discfilter units for the first two stages of treatment, sending highly filtered effluent to third-stage polymeric membrane microfiltration. The ACTIFLO CARB process combines microsand ballasted clarification with adsorption on powdered activated carbon to remove organic matter, taste and odor compounds, endocrine disruptors and pesticides. The compact and energy-efficient Hydrotech Discfilter produces high-quality effluent despite high solids loadings and upset conditions.

Bridgeport pollution control authority enters wastewater treatment partnership

The Water Pollution Control Authority of the City of Bridgeport, Conn., selected Severn Trent Services to provide long-term operation, maintenance, management and customer services for its wastewater collection and treatment systems through a public-private partnership. The 10-year contract includes two subsequent five-year options. The authority's system includes two wastewater treatment facilities with 40 mgd total capacity; 10 sewage pump stations; and 283 miles of sewers, 123 miles of which are combined. The system serves a population of 175,000.

Parkson delivers headworks sluice to manage solids from screens to disposal

Parkson Corp. is redesigning the headworks at the Missouri River Wastewater Treatment Plant in Omaha, Neb., to implement a sluiced screenings system that will improve operators' ability to manage wet-weather conditions and reduce maintenance. The design is built around the Aqua Guard Model S screen and Aqua WashPress washer compactor. From the screens, the sluice system will transfer screenings to the Aqua WashPress units, where the solids can be deposited at a more convenient location for workers.

Layne Christensen Heavy Civil Division wins \$24 million in contracts

Layne Christensen Company's Heavy Civil Division received two water infrastructure contracts worth a combined \$24 million. The company will construct a state-of-the-art water treatment plant for the City of Roswell, Ga., expanding water capacity to 3 mgd and saving the city a projected \$11.6 million over 20 years by reducing outside water purchases, and lowering repair and refurbishment expenses. The Heavy Civil and Inliner divisions are collaborating on a multifaceted project to improve water infrastructure for the Skyview Utilities system in Lakeland, Fla. The project includes a new wastewater treatment system, replacement of outdated water distribution facilities and construction of new water distribution piping. Work on both projects began in May.

GE technology to help remove toxic metals from wastewater at Canadian coal mine

The Anglo American mining company chose the Advanced Biological Metals (ABMet) removal process technology from GE to remove nitrate and selenium from wastewater at its Peace River Coal Trend Mine in Tumbler Ridge, British Columbia. The facility is turnkey, providing a flexible solution for heavy metal removal to meet stringent provincial standards for selenium and nutrient discharges. The ABMet process uses naturally occurring microbes to reduce selenium and other metals. It involves running wastewater through a biologically active filter seeded with microbes that target selenium and other metals. The plant is designed to treat 380 gpm, reducing nitrates from 85 mg/L to 3 mg/L and selenium from 130 $\mu g/L$ to 5 $\mu g/L.$

Anaergia chosen to build biogas upgrading facility in Pima County

Anaergia and its project partner Grannus entered negotiations with the Pima County Regional Wastewater Reclamation Department in Arizona to design, build, finance, own and operate a large-scale biogas upgrading facility that produces a renewable biomethane. The department operates nine wastewater treatment facilities. Most biosolids are transferred to a central handling and treatment facility, where anaerobic digestion produces biogas. The project goal is to create a marketable biogas that generates revenue and can offset wastewater treatment costs.

Nation's largest fluoride treatment plant awards contract to Severn Trent Services

Severn Trent Services was selected to provide its SORB 09 fluoride removal system to the Andrews Fluoride & Arsenic Treatment Plant in Andrews, Texas. The system will have a capacity to treat up to 5,000 gpm, enabling the city to remove fluoride and arsenic to below minimum drinking water standards of 2.0 ppm. The SORB 09 fixed-bed adsorption technology removes fluoride from the water onto solid activated alumina. Treatment will be conducted with a downward flow through four adsorber vessels in parallel configuration.

World's largest UV disinfection facility wins Best of the Best Projects Award

The New York City Department of Environmental Protection Catskill-Delaware Ultraviolet Disinfection Facility, the largest ultraviolet water treatment facility in the world, won a 2013 Best of the Best Projects Award from Engineering News-Record (ENR) magazine. The facility qualified after winning New York's 2013 Best Projects Award from ENR. CH2M HILL, in partnership with ARCADIS, was construction manager on the project. tpo





AdEdge intelligent thinking... ...clean water

Adsorption Ion Exchange Coagulation Membrane Technology General Filtration **Biological Treatment** Pre & Post Treatment



www.adedgetechnologies.com



worth noting

people/awards

Pennsylvania American Water's **Philipsburg Water Treatment Plant** received the elite Phase IV Presidents Award recognition under the Partnership for Safe Water.

The **Huntsville (Pa.) Water Treatment Plant** was recognized for maintaining the Phase III Directors Award status for five years under the Partnership for Safe Water.

The **American Water Military Services Group** was recognized with a Phase III Directors Award for Distribution System Optimization under the Partnership for Safe Water for the distribution systems it manages for two Air Force bases.

The City of West Sacramento, Calif., renamed its water plant as the **George Kristoff Water Treatment Plant,** in honor of an activist who fought to replace an unpopular private water provider with a public water system in the 1980s.

Jim Shears and **Dave Underwood** of the Three Rivers (Mich.) Wastewater Treatment Plant were recognized by the City Commission for passing their Wastewater Operator B certification exams.

The **Gresham (Ore.) Wastewater Treatment Plant** received a 2014 Mayors' Climate Protection Award for cities with less than 100,000 population. The plant once was the city's largest electricity user but now produces all its electricity with a cogenerator, a solar array and a fats, oils and grease receiving station.

Matthew Peleschak, project manager in Larson Design Group's water/ wastewater department, received the Golden Manhole Society Award from the Pennsylvania Water Environment Association.

The **West Side Wastewater Treatment Plant** serving the Kentucky cities of Madisonville, Hanson and Earlington, received its ninth straight Governor's Safety and Health Award.

Deepika Kurup of Nashua, N.H., won the 2014 U.S. Stockholm Junior Water Prize for his project, "A Novel Photocatalytic Pervious Composite for Degrading Organics and Inactivating Bacteria in Wastewater."

Kenny Gibbar, foreman and head operator at the Jackson Wastewater Treatment Facility, received the Wastewater Operator of the Year Award at the Missouri Water and Wastewater Conference.

The Arkansas Water Environment Association announced award recipients:

- Larry Collins, City Corporation (Russellville), Wastewater Manager of the Year
- Blake Jackson, Little Rock Wastewater, Young Professional of the Year
- **Fayetteville Wastewater,** Safety Award for cities with more than 20,000 population
- David Dean, Pine Bluff Wastewater, Collection Systems Award

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

education

AWWA

AWWA is offering these courses:

• Oct. 2-23 – ArcGIS: Introductory Training, New Brunswick, N.J.

- Oct. 6-25 High-Tech Operator Course 2, online
- Oct. 8 Disinfection Byproducts State of the Science and Implications, online
- Oct. 15-17 10th WATER Technologies Short Course, College Station, Texas

Visit www.awwa.org.

Alaska

The Alaska Department of Environmental Conservation Division of Water is offering these courses:

- Oct. 8-9 Pumps & Pump Systems: Specifications, Installation and Operation, Anchorage
- Oct. 20-24 Introduction to Small Water Systems, Fairbanks
- Oct. 22-23 AWWMA SE Alaska Training Conference, Sitka
- Oct. 27-30 ARWA 16th Annual Training Conference, Anchorage Visit www.dec.alaska.gov.

Arkansas

The Arkansas Environmental Training Academy is offering these courses:

- Oct. 1-15 Intermediate Water Treatment, online
- Oct. 14 Basic Water Math, Russellville
- Oct. 15 Applied Water Math, Russellville
- Oct. 16-31 Intermediate Water Distribution, online
- Oct. 16 PWS Compliance, Russellville
- Oct. 21-23 Intermediate Water Treatment, Maumelle Visit www.sautech.edu/aeta/schedule.aspx.

The Arkansas Rural Water Association is offering an Advanced Water course in West Fork Oct. 21-23. Visit www.arkansasruralwater.org.

California

The California-Nevada Section of AWWA is offering these courses:

- Oct. 1 Water Use Efficiency Grade 2 Workshop, West Sacramento
- Oct. 6 Backflow Tester Course, West Sacramento
- Oct. 8 Water Use Efficiency Grade 3 Workshop, Rancho Cucamonga
- Oct. 20 EXH-AFC14, Reno
- Visit www.ca-nv-awwa.org.

The California Water Environment Association is holding a Collection System Training Day Oct. 9 in Apple Valley. Visit www.cwea.org.

Florida

The Florida Section of AWWA is offering an AWWA eLearning course online on Oct. 31. Visit www.fsawwa.org.

The Florida Water Environment Association is offering a Biosolids Management course Oct. 17 in Fort Myers. Visit www.fwea.org.

Illinois

The Illinois Section of AWWA is offering these courses:

- Oct. 2 Water Operator Exam Refresher for Class A and B, Elgin
- Oct. 9 Annual Regulatory Update, Elgin
- Oct. 14 Telemetry: A Detailed Look at Telemetry, Winnetka
- Oct. 16 Telemetry: A Detailed Look at Telemetry, Moline
- Oct. 20-21 High Tech Operator Course 3, Chicago
- Oct. 27 Fluorine, Fluoridation and Fluoride Measurement Methods, online

Visit www.isawwa.org.

Indiana

The Alliance of Indiana Rural Water is offering these courses:

• Oct. 21 – GIS Mapping, Scottsburg

• Oct. 29 – Lift Station Troubleshooting and Pump Service, Indianapolis Visit www.inh2o.org.

Michigan

The Michigan Section of AWWA is offering these courses:

- Oct. 14-16 Distribution System Short Course, Gull Lake
- Oct. 14-16 Limited Treatment Short Course, Gull Lake

Visit www.mi-water.org.

The Michigan Water Environment Association is offering a Health and Safety seminar Oct. 29 in East Lansing. Visit www.mi-wea.org.

Nebraska

The Nebraska Water Environment Association is offering a Wastewater Training course Oct. 6-8 in Lincoln. Visit www.ne-wea.org.

New Jersey

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

- Oct. 17 Discharge Monitoring Reports, Bordentown
- Oct. 28 Water Sampling and Laboratory Procedures, Dover Visit www.cpe.rutgers.edu.

New York

- The New York Section of AWWA is offering these courses:
- Oct. 7 Water Meter Design and Maintenance, Utica
- Oct. 13 Basic Electrical Power Systems and Communications, Melville
- Oct. 15 Dam Safety, Kingston
- Oct. 21 Water Well Rehab and Maintenance, Lyons
- Oct. 29 Basic Laboratory Skills, Rochester

Visit www.nysawwa.org.

The New York Water Environment Association is offering these courses:

- Oct. 23 Solids Handling and Dewatering, Babylon
- Oct. 29 Solids Handling and Dewatering, Bath
- Visit www.nywea.org.

Ohio

The Ohio Water Environment Association is offering a Watershed Workshop Oct. 30 in Columbus. Visit www.ohiowea.org.

Oklahoma

- Rose State College is offering these courses in Midwest City:
- Oct. 17 Disinfectant Byproducts Control
- Oct. 20-23 A/B Water Operator
- Oct. 24 OSHA 8 Hour Hazwoper Refresher
- Oct. 27-28 D-Water Operator
- Oct. 29-30 D-Wastewater Operator

Visit www.rose.edu/oklahoma-environmental-training-center.

Accurate Environmental is offering these courses:

- Oct. 13-16 A/B Water Operator, Stillwater
- Oct. 20-23 C Water Laboratory, Stillwater
- Oct. 21-23 D Water and Wastewater Operator, Tulsa Visit www.accuratelabs.com.

Texas

The Texas Water Utilities Association is offering these courses:

- Oct. 7-9 Utility Safety, San Marcos
- Oct. 13-17 Instructional Design and Evaluation, Austin
- Oct. 14-16 Basic Water, Victoria
- Oct. 21-23 Wastewater Lab, Gatesville
- Oct. 28-30 Valve and Hydrant Maintenance, Longview Visit www.twua.org.

Utah

The Intermountain Section of AWWA is offering these online courses:

events

Sept. 27-Oct. 1

Water Environment Federation WEFTEC 2014 Morial Convention Center, New Orleans. Visit www.weftec.org.

Oct. 7-9

Iowa Section of AWWA 2014 Annual Conference, Altoona. Visit www.ia-awwa.org.

Oct. 7-10

Wisconsin Department of Natural Resources 2014 Wisconsin Wastewater Operators Association Annual Conference, Green Bay. Visit http://dnr.wi.gov.

Oct. 9-10

Quebec Section AWWA 2014 Annual Conference, Quebec City. Visit www.reseau-environnement.com/fr/eau/awwa.

Oct. 12-14

Alabama-Mississippi Section AWWA 2014 Annual Conference, Point Clear, Ala. Visit www.almsawwa.org.

Oct. 12-14

Southwest Section AWWA 2014 Annual Conference, Tulsa, Okla. Visit www.swawwa.org.

Oct. 14-16

North Dakota Section AWWA 2014 Annual Conference, Fargo. Visit www.awwand.org.

Oct. 19-22

Atlantic Canada Water & Wastewater Association Annual Conference, Halifax (Nova Scotia) Marriott Harbourfront Hotel. Visit www.acwwa.ca.

Oct. 20-21

California-Nevada Section 2014 Annual Conference, Reno. Visit www.ca-nv-awwa.org.

Oct. 26-29

AWWA 2014 Water Infrastructure Conference, Atlanta. Visit www.awwa.org/conferences-education/conferences/water-infrastructure.aspx.

- Oct. 9 Hydraulic Modeling, PUDs, and Managing Water System Growth
- Oct. 9 GIS Systems: How They Can Help the Operator Reach Success Visit www.ims-awwa.org.

Wisconsin

The University of Wisconsin- Madison Department of Engineering Professional Development is offering these courses in Madison:

- Oct. 27-31 Cross-Connection Control and Backflow Prevention
- Oct. 31 ASSE Backflow Prevention Assembly Tester Exam Visit www.epdweb.engr.wisc.edu.

The University of Wisconsin- Milwaukee School of Continuing Education is offering these courses in Milwaukee:

- Sept. 29-Oct. 1 Monitoring, Controlling and Optimizing Operations in Wastewater Treatment Plants
- Oct. 1-3 Energy Optimization in Water and Wastewater Treatment Plants
- Oct. 23 Native Landscape Design for Stormwater
- Oct. 24 Water Harvesting Systems and Application

Visit www4.uwm.edu/sce/program_area.cfm?id=3881. (continued)

MARKETPLACE ADVERTISING





CLASSIFIED ADVERTISING OCTOBER

BUSINESSES

Business for sale in fastest growing county in US. All or assets-only - taking top bids by Nov 1. Well-known & respected, familyowned and operated septic tank cleaning company based in Fort Bend County, Texas, servicing the region southwest of Houston. Two (2) vacuum trucks, both in good working order with aluminum tanks & Allison auto, transmissions: 2007 Peterbilt with 4,000-gallon tank; 1997 Chevy with 1,900-gallon tank. Centrally located state registered transfer station in good standing with TCEQ, 500-barrel frac tank in good condition. 34 years worth of 7000+ satisfied commercial & residential customer data. 281-342-9891. kcheath@gmail.com (011)

DEWATERING

FKC Screw Press, Class 'A'; JWC septage receiving station; Fulton boiler; Spiroflow bulk dispenser; Xerxes tanks and Gorman-Rupp pumps. For additional information contact John W. Campbell 231-547-4429 or jwc@bigfishenvironmental.com (P10)

EDUCATION

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

POSITIONS AVAILABLE

SCADA/IT Technician - Wheaton Sanitary District (WSD), IL, is hiring a SCADA/IT Technician. Refer to www.wsd.dst.il.us for info; No phone calls; EOE. (010)

RENTAL EQUIPMENT

Liquid vacs, wet/dry industrial vacs, combination jetter/vacs, vacuum street sweeper & catch basin cleaner, truck & trailer mounted jetters. All available for daily, weekly, monthly, and yearly rentals. VSI Rentals, LLC, (888)VAC-UNIT (822-8648) www. vsirentalsllc.com (PBM)

The Wisconsin Rural Water Association is offering these courses:

- Oct. 2 Bloodborne Pathogens/Hazard Communication/Lockout-Tagout, Jackson
- Oct. 2 Cross Connection Control Assembly Tester Refresher, Plover
- Oct. 13-17 Cross Connection Tester Certification, Plover
- Oct. 22 Excavation Competent Person Safety, Oconto Falls Visit www.wrwa.org.

The Wisconsin Department of Natural Resources is offering these courses:

- Oct. 7-9 Water Industry Professional Prep, Milwaukee
- Oct. 14 Surface Water Certification, West Bend
- Oct. 14-16 Safe and Efficient Fresh Water Transport and Distribution, Milwaukee
- Oct. 16 Regional Utility Management Training, Dodgeville
- Oct. 17 Water Purification Processes in Modern Water Works, Milwaukee
- Oct. 21-23 Key Processes of Wastewater Transport and Control, Milwaukee
- Oct. 22-23 Iron, Zeolite and VOC Certification, West Bend
- Oct. 22 Excavation Competent Person Safety, Oconto Falls
- Oct. 28-30 Fundamentals of Modern Wastewater Treatment Process, Milwaukee
- Oct. 29-30 Iron, Zeolite and VOC Certification, Chippewa Falls Visit http://dnr.wi.gov. tpo

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

It's your magazine. Tell your story.

Send your ideas for future articles to editor@tpomag.com



Sell your equipment in Treatment Plant Operator classifieds

Reach over 72,000 potential buyers each month when you list your equipment in the classified section. Plus, your listing is placed automatically online at the Treatment Plant Operator website. That's two ways to move your equipment out of the parking lot!





Go to tpomag.com/classifieds/place ad

GET GOING. GET DECENTRALIZED.



COMPLETE TREATMENT & CONTAINER SYSTEM SOLUTIONS

For municipalities and industry specifying off-grid wastewater treatment systems to meet growing demands, Smith & Loveless leads the way. Our compact system designs produce high quality effluent while minimizing footprint and long-term 0&M costs.

We deliver single-source MBR, Fixed-Film and Extended Aeration solutions, including in packaged and containerized models for plug and play treatment and rapid growth applications. From design support, to installation, to field service and technical support, we are there every step of the way. Especially when your way is off the grid.



Smith & Loveless Inc. Above All Others.™



Request a budget proposal and/or our design catalog today!

Call 800.922.9048 VISIT SmithandLoveless.com



Pollardwater offers the most complete line of pumps and pump accessories for Water and Wastewater.



