

TREATMENT PLANT OPERATOR

tpo™

DEDICATED TO WASTEWATER & WATER TREATMENT PROFESSIONALS

tpomag.com
APRIL 2017

HEARTS AND MINDS:
Plant tour en masse

PAGE 18

Age Is *No Barrier*

Milton Vann
Plant Supervisor
Wilmington, N.C.

**A TRICKLING FILTER PLANT AT
CAPE FEAR PUBLIC UTILITY KEEPS
CHURNING OUT QUALITY EFFLUENT**

PAGE 20

**IN MY WORDS:
Keys to phosphorus analysis**

PAGE 34

**TECHNOLOGY DEEP DIVE:
A smart pumping solution**

PAGE 32

ProSeries-M[®]

PRECISION CHEMICAL METERING

FOR THE TREATMENT OF MUNICIPAL WATER & WASTEWATER.

Now Shipping!

HYBRID DIAPHRAGM
METERING PUMP

ProSeries-M[®]
MD-3

MD-3 DELIVERS A NEW LEVEL OF PERFORMANCE AND FUNCTION IN CHEMICAL METERING

MD-3 Features Include:

- The best turnaround in the industry at 2000:1.
- Flow rate: .03–57 GPH (.11–216 LPH). Maximum working pressure: 145 psig (10 bar).
- Smooth chemical dosing, no pulsation dampener needed.
- A single model number will handle all your needs.
- Equipped with Blue-White's exclusive DiaFlex[®] diaphragms.
- Multiple U.S. and international Patents Pending.

CHEM-PRO[®] M

METERING
INJECTOR PUMP



NSF
Standard 61

NEMA 4X
WASH DOWN

DFD system
Diaphragm Failure Detection

CE ETL

PRECISE CHEMICAL METERING EVEN AT HIGH PRESSURES

CHEM-PRO[®] M Benefits:

- Chem-Pro[®] M handles system pressures to 175 PSI (12 bar).
- Excellent accuracy and outputs to 40 GPH (153 LPH).
- Operator-friendly user interface. LCD shows Output Volume, Motor % Speed, Input Signals, Service & Alarm Status.
- High resolution motor adjustment 0.5–100%. Output capabilities with 0.1% increments.

IP66
NEMA 4X
WASH DOWN

NSF
Standard 61

CE ETL



PRECISION CHEMICAL METERING FOR OVER 60 YEARS

Blue-White www.proseries-m.com • www.blue-white.com

5300 Business Dr., Huntington Beach, CA 92649 USA • 714-893-8529 • sales@blue-white.com

WELCOME TO THE POWER OF CLARITY



Be Right™

Only Hach provides a solution of connected instruments and software to end uncertainty in your water, 24/7. Streamline your operations and costs. Ensure compliance. When data becomes actionable insight — that's **The Power of Clarity**.

hach.com/clarity

FREE INFO - SEE ADVERTISER INDEX



For Treatment Plant Air/Gas Flows, We're the One



Insertion



In-line



Remote
Up to 1000'
[300 m]

ST100 Series Thermal
Mass Gas Flow Meters

FCI's New ST100 Series Flow Meters

In municipal wastewater and water treatment plants, FCI thermal flow meters are the leading solution specified by system operators and their engineering team for aeration, digester, ozone and disinfection gas systems applications. The new ST100 Series combines FCI superior constant power thermal technology and choice of application matched sensor designs with state-of-the-art electronics and precision calibration to deliver the highest performing and long-life flow meter solution.

- Multiple analog outputs of flow rate, total flow, temperature and/or pressure
- HART, FOUNDATION™ fieldbus, PROFIBUS PA, Modbus RS-485
- Store and recall multiple calibrations
- On-board data logger
- Best-in-class graphical display
- Integral or remote transmitter mount
- Rugged, NEMA 4X/IP67 multi-port enclosure
- FM, FMc, ATEX, IECEx agency approvals

Call or visit FCI online today to learn more about how ST100 Series is the one to solve your treatment plant's air/gas flow meter applications.

FCI FLUID COMPONENTS
INTERNATIONAL LLC

Visit FluidComponents.com/ST100
for a self-toured demo

1-800-854-1993 ■ 1-760-744-6950



© Copyright 2013 Fluid Components International, LLC. All rights reserved.

advertiser index

APRIL 2017

| | FREE INFO | | FREE INFO | | |
|---|-----------|--------------------------|--|----|--------------------------|
| AdEdge Water Technologies, LLC | 5 | <input type="checkbox"/> | HUBER TECHNOLOGY Huber Technology, Inc. | 9 | <input type="checkbox"/> |
|  Aerzen USA | 15 | <input type="checkbox"/> | International Products Corporation | 37 | <input type="checkbox"/> |
|  AllMax Software, Inc. | 33 | <input type="checkbox"/> |  JDV Equipment Corporation | 8 | <input type="checkbox"/> |
|  Aqua-Aerobic Systems, Inc. ... | 59 | <input type="checkbox"/> |  Keller America Inc. | 17 | <input type="checkbox"/> |
| ASA Analytics | 59 | <input type="checkbox"/> |  Komline-Sanderson Komline-Sanderson | 59 | <input type="checkbox"/> |
| BinMaster Level Controls | 59 | <input type="checkbox"/> | Markland Specialty Engineering Ltd. | 49 | <input type="checkbox"/> |
|  Blue-White Industries | 2 | <input type="checkbox"/> | ProComSol, Ltd | 53 | <input type="checkbox"/> |
|  Eagle Microsystems, Inc. | 33 | <input type="checkbox"/> | SEEPEX. ALL THINGS FLOW SEEPEX Inc. | 25 | <input type="checkbox"/> |
| Fatboy Outdoors | 47 | <input type="checkbox"/> | USABlueBook | 60 | <input type="checkbox"/> |
| FCI - Fluid Components International | 4 | <input type="checkbox"/> |  Vaughan Company, Inc. | 11 | <input type="checkbox"/> |
|  Force Flow | 37 | <input type="checkbox"/> | Wigen Water Technologies ... | 25 | <input type="checkbox"/> |
|  Gorman-Rupp Company | 7 | <input type="checkbox"/> | CLASSIFIEDS | 59 | |
|  Hach | 3 | <input type="checkbox"/> | | | |

FREE Information from Advertisers (check the Free Info boxes above)

PRINT NAME: _____ TITLE: _____

FACILITY NAME: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

PHONE: _____ CELL PHONE: _____

FAX: _____ EMAIL: _____

Scan and email to: nicole.labeau@colepublishing.com / Fax to: 715-546-3786
Mail to: COLE Publishing Inc., P.O. Box 220, Three Lakes WI 54562

Connect
with us

[Facebook.com/TPOmag](https://www.facebook.com/TPOmag)
[Twitter.com/TPOmag](https://twitter.com/TPOmag)
[Plus.google.com](https://plus.google.com/)
[Youtube.com/TPOmagazine](https://www.youtube.com/TPOmagazine)
[Linkedin.com/company/treatment-plant-operator-magazine](https://www.linkedin.com/company/treatment-plant-operator-magazine)





ARSENIC IS **NOT** A GAME

Ready to make the right move?

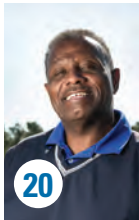
AdEdge is your one-stop resource for arsenic treatment systems for any size community. We now supply Bayoxide E33 adsorptive media and E33 media replacements for the largest and the smallest systems. As always, AdEdge offers competitive pricing, experienced engineers, and unparalleled support.

With AdEdge's arsenic treatment systems' global success history, why would you go anywhere else?

When you're ready to make the right move, call us at **866.823.3343**.



www.AdEdgetech.com



on the cover

Maybe you can't teach an old dog new tricks, but that doesn't mean an old treatment plant can't keep up with the times. The Cape Fear Public Utility Authority's M'Kean Maffitt wastewater treatment plant under Milton Vann, plant supervisor, produces exceptional effluent even though its original trickling filter and other equipment are up to 45 years old. (Photography by Andrew Craft)

top performers:

WASTEWATER: PLANT Page 12

All About Service

The team at Eagle Mountain does an exemplary job with a new extended aeration plant — and isn't above reaching out to help neighboring facilities.

By Trude Witham

WATER: PLANT Page 38

A Step Up in Class

A new membrane filtration plant challenges the operations staff but yields higher-quality water for a growing Utah community.

By David Steinkraus

WASTEWATER: OPERATOR Page 28

The Right Choice

Bryan Leighow is glad his career path led to the clean-water profession. He finds endless variety and great satisfaction in producing quality effluent.

By Trude Witham

WASTEWATER: PLANT Page 20

Age Is No Barrier

A trickling filter plant at Cape Fear Public Utility keeps churning out quality effluent through sound maintenance and judicious upgrades.

By Jim Force

LET'S BE CLEAR Page 8

This Is Your Brain on Water

A best-selling book makes a compelling case for the inherent power of water to soothe, heal, inspire, and make us better, happier human beings.

By Ted J. Rulseh, Editor

@TPOMAG.COM Page 10

Visit daily for exclusive news, features and blogs.

HEARTS AND MINDS Page 18

Tour-Palooza

A California sanitary district hosted some 700 students and chaperones in two days as part of the local school district's Science Education Week.

By Ted J. Rulseh

SUSTAINABLE OPERATIONS Page 26

That Extra Measure

Treated reclaimed water fills popular man-made recreation lake and protects the drinking water supply in drought-stricken California.

By Doug Day

TECHNOLOGY DEEP DIVE Page 32

Smart Pumping

Flygt Concertor system for wastewater applications is designed to minimize energy usage, reduce pump station cleaning costs, and shrink pump inventories.

By Ted J. Rulseh

IN MY WORDS Page 34

Right Measurements, Right Places

Effective and precise control of phosphorus can improve compliance and save money. It starts with smart application of phosphorus analyzers.

By Ted J. Rulseh

PLANTSCAPES Page 44

Fabulous Forest

The nation's Carpet Capital is also home to an extensive effluent land application site that doubles as a haven for birds and wildlife.

By Jeff Smith

INDUSTRY NEWS Page 45

PERSPECTIVE Page 46

Out With RIBs?

Rapid infiltration basins waste water that has undergone some level of treatment. Lined reject ponds that store water for retreatment are a sound alternative.

By Kirk Boulterice

HOW WE DO IT: WASTEWATER Page 48

Process Improvement Made Simpler

Low-cost modifications to the aeration process at a small Massachusetts plant bring substantial effluent nutrient reductions and other money-saving improvements.

By Ted J. Rulseh

PRODUCT FOCUS Page 50

Monitoring and Instrumentation

By Craig Mandli

CASE STUDIES Page 55

Monitoring and Instrumentation

By Craig Mandli

PRODUCT NEWS Page 56

Product Spotlight – Wastewater: Universal analyzer designed for hazardous areas

Product Spotlight – Water: A constant-speed pumping solution

By Craig Mandli

WORTH NOTING Page 58

People/Awards; Events

coming next month: May 2017

FOCUS: ACE Pre-Show Issue/ Annual Company Directory

» Let's Be Clear: The importance of a sharp-looking building and grounds

» Top Performers:

Wastewater Operator: Ken Burgener, North Davis (Utah) Sewer District

Wastewater Plant: Innovative maintenance at Rock Creek Public Sewer District, Arnold, Missouri

Wastewater Plant: Safety culture at Glenbard Wastewater Authority

Water Plant: Jumping Brook (New Jersey) Water Treatment Plant

» How We Do It: Disinfection upgrade in Anchorage, Alaska

» Sustainable Operations: Targeting net zero in Jackson, Wyoming

» In My Words: Training the next generation of operators

» PlantScapes: Constructed grassland in Kokomo, Indiana

» Technology Deep Dive: Microscreen technology for primary treatment

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

RELIA SOURCE

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.

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.

INTEGRINEX™

GORMAN-RUPP PUMPS

P.O. BOX 1217 | MANSFIELD, OHIO 44901-1217 | USA
419.755.1011 | GRSales@GORMANRUPP.COM | GRPUMPS.COM

GOR
GORMAN-RUPP
PUMPS

The Pump People®



JDV LEVEL LODOR™

*Design for Even Distribution
&
Odor Control*

www.jdvequipment.com



FREE INFO – SEE ADVERTISER INDEX



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 and water 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 nicole.labeau@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 nicole.labeau@colepublishing.com.

ADVERTISING RATES: Call 800-994-7990 and ask for Phil or Kim or email phil.hahn@colepublishing.com or kim.bruss@colepublishing.com. 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 jeff.lane@colepublishing.com. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicole.labeau@colepublishing.com.

CIRCULATION: 68,317 copies per month.

© 2017 COLE PUBLISHING INC.

No part may be reproduced without permission of publisher.



let's be clear

This Is Your Brain on Water

A BEST-SELLING BOOK MAKES A COMPELLING CASE FOR THE INHERENT POWER OF WATER TO SOOTHE, HEAL, INSPIRE, AND MAKE US BETTER, HAPPIER HUMAN BEINGS

By Ted J. Rulseh, Editor

I've often wondered what makes water and wastewater operators, as a general rule, such humble, well grounded, capable, collegial and contented professionals. A book

I read recently points toward an answer: Could it be the mere fact of working with and around water?

Blue Mind, by Wallace J. Nichols, makes a convincing scientific argument that being near, in, on or under water makes people happier, healthier, more connected, and better at what they do. Operators in our industry aren't always in scenic settings in the manner of, say, marine biologists or ferry boat captains. But they do work intimately with water every day and care about its quality as much as or more than people in other water-related professions.

So, if Nichols' premise holds true — and he backs it up with volumes of data from scientific studies — it's no

surprise that the people who run treatment plants come heavily under the influence of water, with all the physical and psychological benefits that implies.



EXPLORING THE WHY

Nichols begins by asking why we love water so much. He observes that to a meaningful extent we are water. In the womb we're immersed in a watery environment. Our bodies are 78 percent water at birth. Our brains are 80 percent water. "In its mineral composition, the water in our cells is comparable to that found in the sea," Nichols writes.

In exploring his subject, Nichols worked with scientists, psychologists, researchers, athletes, explorers, artists and others to consider: "What happens when our most complex organ — the brain — meets the planet's largest feature — water?"

Along the way, he draws on research in which the brain's responses to water were measured by techniques such as electroencephalography (EEG) and functional magnetic resonance imaging (fMRI). These studies document that our affinity for water is not merely some ethereal conjecture; it is hardwired into our physical being.

EXTENSIVE EVIDENCE

Nichols cites many and diverse examples of water's attraction and power. "Most real estate agents will tell you that 'ocean view' is the most valuable phrase in the English language," he says. He mentions two penthouse apartments in the same San Francisco building: The one with a view of the bay sold for \$500,000 more than the one overlooking the city.

Do you care to guess what people worldwide say is their favorite color? It's blue, says Nichols, "beating its closest competing color by a factor of three or four."

Water can be part of the cure for drug and alcohol addiction. A California program called Surfing to Recovery

“ We are inspired by water — hearing it, smelling it in the air, playing in it, walking next to it, painting it, surfing, swimming or fishing in it, writing about it, photographing it, and creating lasting memories along its edge.”

WALLACE J. NICHOLS, FROM *BLUE MIND*

takes addicts surfing, whitewater kayaking or sailing to help them replace the rush from drugs with a more natural kind of high. The activities on water can actually change their brain chemistry.

It's well documented that hospital patients feel better, recover faster, and need less pain medication if they're exposed to natural scenes, whether outside windows or in works of art. But the effect is the most pronounced when that natural scene shows open water, Nichols observes.

BLUE MARBLES

To Nichols, "*Blue Mind*" is not just a book title. It is a form of consciousness, "a mildly meditative state characterized by calm, peacefulness, unity and a sense of general happiness and satisfaction with life in the moment." In short, the state of mind we readily experience when close to water.

In his speaking engagements, Nichols likes to give each audience member a blue marble, a symbol of the iconic picture of Earth taken from the moon by the crew of Apollo 17: "It's a reminder to us all to be grateful, for each other and for our beautiful world." And, of course, for the water that makes it so.

Those receiving the blue marble are encouraged to pass it along to someone they appreciate as an expression of gratitude. I'd argue that each reader of this magazine deserves a blue marble.

Nichols concludes, "Fall more deeply in love with water in all its shapes, colors and forms. Let it heal you and make you a better, stronger version of yourself. You need water. And water needs you now." **tpo**



Every day
is Earth Day.™

Read about it. **FREE subscription at tpomag.com**

THICKEN YOUR SLUDGE



S-Disc Disc Thickener

Patented disk design provides effective automatic operation

Small footprint allows fit into tight spaces

Low operating costs

Award-winning service & support

Simple to operate

Learn more at:

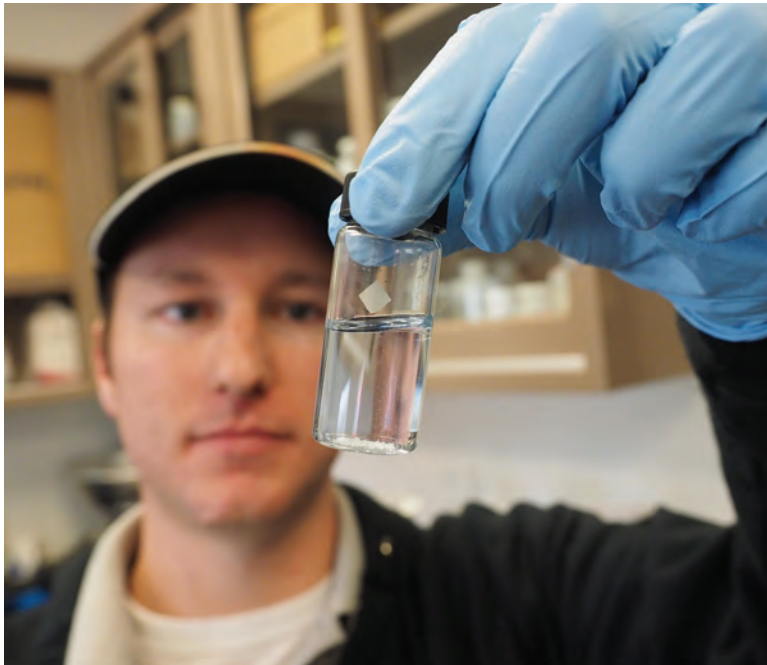
huberforum.net/SDISC

solutions@hhusa.net

704-990-2053

HUBER
TECHNOLOGY
WASTE WATER Solutions

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



DROUGHT RESISTANCE

States Consider DPR

Drought resistance will be key in the coming years, especially in the southwestern part of the nation. That's why California and Arizona are considering the adoption of policies that allow for direct potable reuse. But what will it mean for the operators who have to obtain new certifications and learn new processes?

Tpomag.com/featured

OVERHEARD ONLINE

"In cities across the United States, water affordability is becoming an increasingly critical issue."

Can America Afford the High Cost of Replacing Infrastructure?

Tpomag.com/featured



STAYING EDUCATED

Operator Exchange Program

Guest blogger and WWTP operator Jeff Kalmes has discovered a new way to take his wastewater education beyond the classroom, as he recently participated in New England's Operator Exchange Program. Read along as Jeff tours facilities in Vermont and Massachusetts and gets an inside look at how other operators get the job done.

Tpomag.com/featured



Emails & Alerts

Visit 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.



Join the Discussion

[Facebook.com/TPOmag](https://www.facebook.com/TPOmag)
[Twitter.com/TPOmag](https://twitter.com/TPOmag)

BATTLING REGULATIONS

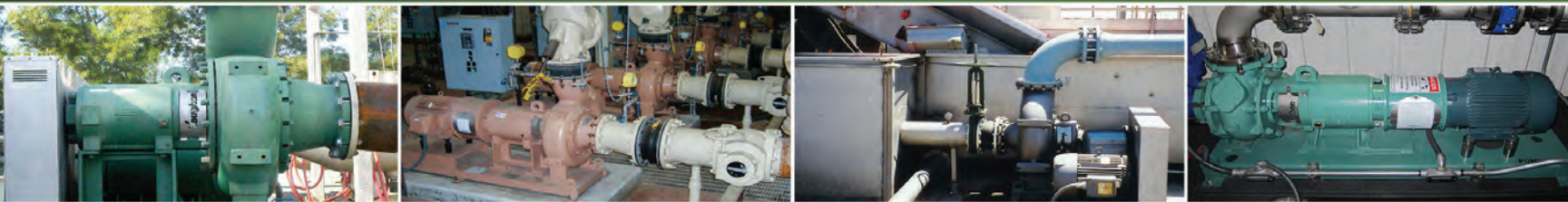
Cities Band Together

The state agencies that make the rules might not always have the best idea what's going on at your own community's wastewater treatment plant. In Minnesota, a coalition of 41 municipalities near a river basin are battling the state's proposed phosphorus standards, saying it will cost too much and won't fix anything.

Tpomag.com/featured



CAN'T GET SCREW PUMPS OR PARTS FROM YOUR CURRENT PROVIDER?



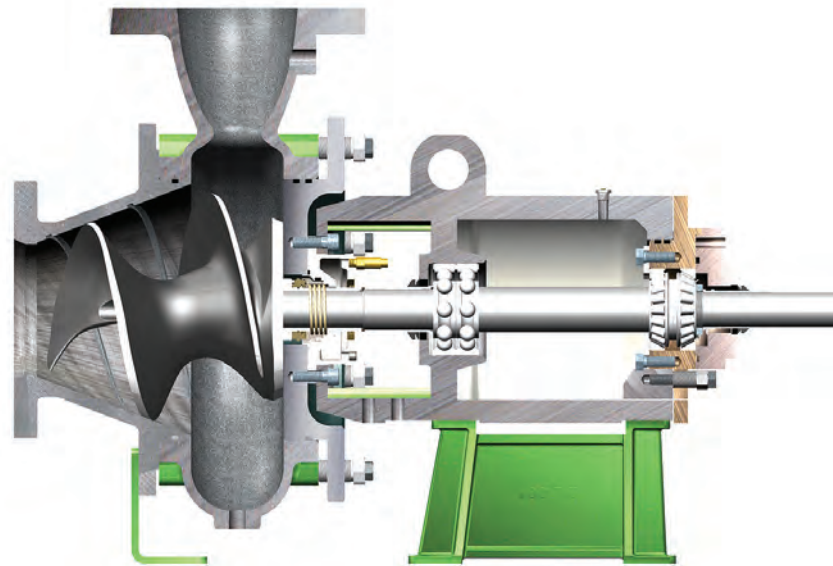
TURN TO A MORE RELIABLE OPTION WITH VAUGHAN TRITON SCREW PUMPS.



Triton Configurations

From municipal wastewater to food processing to industrial applications, there's a Triton Screw Centrifugal Pump for the job. Choose from a variety of configurations, all of which deliver the reliability, efficiency and durability you expect from Vaughan.

- 4 to 6 week delivery on standard materials
- Parts inventory on the shelf
- Multiple configurations available
- Special materials available
- 3-12" discharge



Call Vaughan today to find out which configuration will work best for your project.

ChopperPumps.com | 360.249.4042 | info@chopperpumps.com



FREE INFO - SEE ADVERTISER INDEX



Matt Goodrich, wastewater
supervisor at the Eagle Mountain
Water Reclamation Plant

All About *Service*

THE TEAM AT EAGLE MOUNTAIN DOES AN EXEMPLARY JOB WITH A NEW EXTENDED AERATION PLANT — AND ISN'T ABOVE REACHING OUT TO HELP NEIGHBORING FACILITIES

STORY: **Trude Witham**

PHOTOGRAPHY: **Sallie Shatz**

THE FOUR OPERATORS AT THE EAGLE MOUNTAIN WATER RECLAMATION PLANT ARE USED TO DOING

a lot with a little. Their efficiency and excellent work ethic have served them well. In 2016, they won the 2015 Outstanding Wastewater Service to Customers Award from the Rural Water Association of Utah, recognizing long-term performance over 15 years or more.

“We do a good job with what we have,” says Matt Goodrich, wastewater supervisor. “We’ve never had a plant violation, and the collections system has been solid.”

The team does everything, including sampling, collections system operation, cleaning and repair, routine plant maintenance, and solids hauling. Says Goodrich, “We do it all, and we know a little about a lot of things related to the treatment and collection process. Operators at the bigger plants don’t get the variety that we do.”

BEST OPTION

The 1.2 mgd (design) Eagle Mountain plant started up in 2010, replacing a 0.3 mgd package plant from 1998. Population growth had pushed the old plant to capacity. City leaders looked at four options: aerated lagoons, extended aeration (oxidation ditches), membrane bioreactor, or pumping wastewater to the Timpanogos Special Service District (TSSD) water reclamation facility in American Fork.

They chose extended aeration and obtained a grant to help fund the project. Today, the plant serves about 8,300 people in the southern part of the city (south service area). The TSSD treats the wastewater from the north service area. The Eagle Mountain Sewer Department handles the collections for both areas, with help from the TSSD.

Raw wastewater enters the influent pump station and equalization basin, flows through a Parshall flume and enters the headworks with bar screening, PISTA Grit vortex grit collector (Smith & Loveless) and a grit clarifier. From there, the wastewater is sent to the oxidation ditch with Orbal disc aeration system (Evoqua Water Technologies) and



Operators regularly record headworks panel data.

on to two clarifiers. Clarified water is pumped to a storage pond, where it evaporates. When the pond becomes full, the effluent is sent to a rapid infiltration pond where it filters through the ground and into aquifers.

Twenty-five percent of the clarified water is pumped from the storage pond to a chlorine gas disinfection system with an Evoqua regulator and



The Eagle Mountain plant is challenged by extreme weather throughout the year.

“We are a small city in terms of population, but we have the potential to be one of the biggest in the state once industrial and business growth starts picking up. We are trying to be proactive and get a pretreatment program going before it’s a problem.”

MATT GOODRICH

Grundfos booster pump. It then goes to a recycled-water land application field. “We use the recycled water to irrigate the sage brush, which serves as habitat and food for a variety of wildlife,” says Goodrich.

Activated sludge is sent to one of three places, depending on time of day — the oxidation ditch, a Cannibal solids reduction system (Evoqua) or a drying bed. The dried solids are hauled to the landfill.

“Some of our equipment differentiates us from many other plants,” says Goodrich. “For example, we have a rotary drum screen (Evoqua) that filters out hair, pocket lint, small wrappers and paper down to 250 microns. A cyclone separator system (Evoqua) filters out sand, talcum powder and small inorganic particles. And then there is the sidestream interchange bioreactor/solids separation module that is the heart of the Cannibal process.”

REDUCING SOLIDS

The plant staff chose the Cannibal solids reduction system after researching other plants’ experiences with it. “We liked what we saw,” says Goodrich. “Also, the solids reduction would reduce our operating costs.”

While there was no guarantee that Eagle Mountain would see the same reductions as other facilities, the plant is seeing improvement. “We hoped to waste a few times a month, but we are wasting four to five times a week,



WINTER HURDLES

Operators at the Eagle Mountain Water Reclamation Plant deal with extreme weather, from high winds that blow tumbleweeds into the equipment to cold temperatures that freeze the sensors.

"We've had to fish tumbleweeds out of the clarifiers and the oxidation ditch, especially in summer," says Matt Goodrich, wastewater supervisor. "Our biggest hurdle in winter is ice removal. If ice gets on the clarifiers, we have to break it up so it doesn't cause issues with the skimmer system."

He recalls the time the interchange bioreactor level sensor froze: "The level sensor sits in the corner of the tank, along with pH and ORP probes. The sensor doesn't see a lot of sun, and when it freezes, the ice attaches to the two sides of the tank and around the probes and stays suspended.

"When the tank decants, the level sensor reads the ice level and not the actual tank level. So, the tank will continue to decant until it is drained or someone notices the problem." An operator did notice the problem, and the team installed a mixing pump in that corner of the tank so the sensor wouldn't freeze again.

A blizzard in 2015 dumped 10 inches of snow. "Winter is the most stressful time for us, with frozen waterlines and icing on the equipment," Goodrich says. "Summers are usually hot and windy in the afternoons, but the mornings are nice and cool with excellent sunrises over the mountains. I especially love spring, with all the new growth and new life, like baby pronghorn antelope, and baby ducks and geese on our ponds."

The team at the Eagle Mountain plant includes, from left, Daxton Woods and Dalton Harris, Grade 1 operators; Mack Straw, public utilities manager; Matt Goodrich, wastewater supervisor; and Brody Kinder, Grade II operator.

Eagle Mountain (Utah) Water Reclamation Plant

BUILT: | 2010

POPULATION SERVED: | 8,300 people

EMPLOYEES: | 4

FLOWS: | 1.2 mgd design, 0.410 mgd average

TREATMENT LEVEL: | Secondary

TREATMENT PROCESSES: | Oxidation ditch, Cannibal solids reduction process

RECEIVING WATER: | Rapid infiltration pond

BIOSOLIDS: | Landfilled

ANNUAL BUDGET: | \$171,800 (operations)

WEBSITE: | www.eaglemountaincity.com

GPS COORDINATES: | Latitude: 40°18'33.58"N; longitude: 112° 0'43.27"W



at around 1,600 pounds per day," Goodrich says. "This isn't bad, and we are seeing better-than-average solids reduction over a conventional plant that doesn't have a drum screen or cyclone system."

The process posed some training challenges. "Evoqua sent two engineers and a few equipment specialists to help us start up the plant and train us on the process and equipment," says Goodrich. "Evoqua also provided instruction files on plant operation, including how to track solids, solids retention time, flows and other parameters. Project manager and consultant Rod Erickson of Rodeo Construction also taught the team how all the new equipment should operate."



Brody Kinder uses a Sludge Judge sampler (Nasco) to measure the clarifier sludge blanket.

“We all have different talents and ideas, and we use what works best in a particular situation.”

MATT GOODRICH

There were a few headaches during startup: overloaded headworks, clogged pumps, and more flow than the grinder pump could handle. “We had to open our bypass channel to keep the flow from overflowing it,” says Goodrich. “In the solids separation process, the auger for the drum screen would fail, causing the drum screen to shut down.

“Also, the bypass valve wouldn’t automatically open, causing the flow to go out the front of the screen and onto the building’s floor. These challenges helped us learn what to do if the problem ever happened after all the vendors’ employees left the plant to us. It took us about a year to get to the point where we didn’t have to call them or Rod with questions.”

SOLVING PROBLEMS

The operators’ greatest challenges are cleaning rags and baby wipes out of the intake pumps and taking turns hauling biosolids away in a pump truck five days a week. “We spend a lot of time cleaning out the pumps to keep them running,” says Goodrich. “The flow backs up when the pumps stop, and then we have to go to the plant in the middle of the night to get them running again.



AERZEN TURBO. RUNS LIKE A DREAM.

Whether a marathon-runner or a sprinter, MBR or SBR system, the reliable and proven performance of AERZEN Turbo Blowers exceeds all expectations.

AERZEN Turbos impress with up to 80% efficiency. As the core unit in compound systems they generate energy savings of up to 30%. AERZEN Turbo Blowers feature a small footprint and are engineered to integrate seamlessly, with other aeration blower technologies, as the base load blower.

Request a quote from an Aerzen Turbo Blower Specialist:
(610) 380-0244 inquiries@aerzenusa.com

Download The Aerzen Turbo Blower Brochure

www.aerzenusa.com

PD Blowers | Hybrid Blowers | Turbo Blowers



AERZEN
EXPECT PERFORMANCE

FREE INFO – SEE ADVERTISER INDEX

“Two to three times a week, we put solids on the drying bed, depending on how warm it is outside, but we only have one bed, so it’s hard to keep up with the amount of material that needs to be dried.” The team hauls the solids that are not put on the drying bed — about 4,000 pounds per week — to a manhole in the north service area. From that point the material flows to the TSSD.

The team uses ingenuity to solve problems. For example, when the old lift station pumps repeatedly clogged, the operators developed a system to bypass the station without renting expensive equipment.

“We used to have to rent an additional trash pump and about 200 feet of pipe to get the sewage up the street to a gravity-fed manhole,” says Goodrich. “So we installed a valve in the lift station force mainline to prevent back-feeding through the pump when we had our trash pump connected while bypassing the lift station.” The team then installed a cam lock system in the line so they could quickly attach the trash pump and get the flow out of the



**Eagle Mountain Water Reclamation Plant
PERMIT AND PERFORMANCE**

| | INFLUENT | EFFLUENT | PERMIT |
|---------------------------------------|----------|----------|--------------|
| BOD | 212 mg/L | 3 mg/L | No limit |
| TSS | 322 mg/L | 5 mg/L | No limit |
| Total inorganic nitrogen (TIN) | — | 4 mg/L | Monitor only |

Dalton Harris checks the splitter box.

lift station. They used this system three more times to prevent backups when the lift station pumps went down.

HELPING OUT

The plant operators are a diverse group. “We all have different talents and ideas, and we use what works best in a particular situation,” says Goodrich. The plant is staffed seven days a week for 10 hours a day, and the operators rotate weekends and holidays.

“We usually have one person hauling solids and the rest of us are taking care of the plant or the collections system, or a combination,” Goodrich says. A SCADA system remotely monitors the plant after-hours and dials the on-call operator if there is a problem.

Goodrich, who reports to Mack Straw, public utilities manager, holds Grade 4 (highest) wastewater treatment and collections certification. He has been at the plant for 15 years. Reporting to him are operators Brody Kinder (Grade 2, five years), Daxton Woods (one year) and Dalton Harris (new hire).

The team’s exceptional service earned the recognition from Rural Water. One example was assistance to the neighboring community of White Hills in solving a problem with its lagoon system.

“White Hills isn’t tied into our system, but is on a lagoon system, and they don’t have a full-time operator,” says Goodrich. “The inlet to the ponds was blocked by sagebrush, cattails, other debris and rags. We didn’t know where the inlet came into the ponds, so we got a mini-excavator and began digging in the general area where we thought it might be from looking down the influent flowmeter channel.”

They dug for about an hour, but found nothing. Then, one operator found a splitter box downstream of the influent flowmeter channel that diverts the flow to another pond. They dug down to the sewer line and followed it to where it flowed into the pond.

“From the box, the sewer line came out a few feet and then made a turn to the north from where it looked like it went from the influent flowmeter channel,” says Goodrich. “We followed the line to the bottom of the pond

and found a soft spot. We used a blade on the mini-excavator to clear away the brush and started digging.”

Once they cleared away all the debris, the backed-up wastewater started rushing into the pond. “I don’t think I have ever seen guys move so fast, and it’s a good thing the mini-excavator has tracks to get it out of messy situations,” Goodrich recalls. The entire job took about four hours.

FUTURE GROWTH

Goodrich says there are no plans to expand the plant, since it has enough capacity for five to eight years. Improving solids dewatering is on the wish list; the staff hopes to get a screw press in the near future.

The team is also working on an industrial pretreatment program. “Right now, the wastewater we treat is almost 100 percent residential,” Goodrich says. “We are a small city in terms of population, but we have the potential to be one of the biggest in the state once industrial and business growth starts picking up. We are trying to be proactive and get a pretreatment program going before it’s a problem.”

The staff members want to continue taking part in community events. “A while back, we did a video to educate the public about what they should and should not flush,” says Goodrich.

“We recently hosted a community event at the Silver Lake Amphitheater in Eagle Mountain. All city departments were there to educate residents about what we do. We had a good turnout.”

In the more distant future, Goodrich envisions serving the entire valley. “White Hills will be first, and then other places can connect to that line,” he says. “The plant will be huge someday with the residential growth. I see it being a big contributor on the wastewater side.” **tpo**

**featured
products from:**

Evoqua Water Technologies, LLC
www.evoqua.com

Grundfos Pumps
800/921-7867
us.grundfos.com

Nasco Whirl-Pak
800/558-9595
www.enasco.com/whirlpak

Smith & Loveless, Inc.
800/898-9122
www.smithandloveless.com



SUCCESS, in the end, means KELLER from the beginning

Keller America manufactures level and pressure instrumentation built to provide years of low-maintenance, worry free operation for water and wastewater professionals who need to monitor and control processes where reliable measurements are critical. For the very best in level and pressure instrumentation, think Keller...from the beginning.

Acculevel high accuracy level transmitter

- Built to order in the United States
- Custom cable lengths and ranges up to 900 ftWC.
- Dual output - one analog + one digital RS485
- Guaranteed lightning protection at no additional cost
- Standard 3-day lead time





Students from Delta Vista Middle School sixth-grade class toured the Ironhouse Sanitary District Water Recycling Facility last March.

Tour-Palooza

A CALIFORNIA SANITARY DISTRICT HOSTED SOME 700 STUDENTS AND CHAPERONES IN TWO DAYS AS PART OF THE LOCAL SCHOOL DISTRICT'S SCIENCE EDUCATION WEEK

By Ted J. Rulseh

Treating and recycling 4.3 mgd is routine business for the Ironhouse Sanitary District. Giving plant tours to 700 sixth-graders and chaperones in two days certainly is not.

The Water Recycling Facility staff pulled it off in March 2016 in an event billed, "It's a School Tour Like Never Before." Held as part of the Oakley School District's Science Education Week, the tours involved Delta Vista and O'Hara Park middle schools and included nearly all 11- and 12-year-olds in the district's service area.

Students learned about the water recycling process, uses for recycled water, public health and environmental protection, and more. After the tour, teachers received instructional materials to use back in their classrooms.

The tour earned the district an Excellence in Public Education and Outreach Award from the California Association of Sanitation Agencies. "It's great to get so much recognition for the hard work we are doing to educate our community," says Chad Davisson, general manager.

MODERN FACILITY

The Ironhouse district serves an area about 90 miles west of San Francisco. Its \$54.5 million water recycling facility, commissioned in October 2011, has room for expansion to 6.8 mgd.

The tour days grew out of the school system's established science program. For the past 15 years, the schools had sponsored a one-week camping program to give sixth-graders a science experience in a nature setting.

"The place they took them to was a 2 1/2-hour drive," says Roni Gehlke, public education and outreach consultant for the Ironhouse district. "Unfortunately, over time the cost became too much for the parents and the schools to bear, and they had to cancel it."

Harvey Yurkovich, principal at Delta Vista Middle School, contacted Gehlke to inquire about working on an alternative program. They started planning in summer 2015 for a two-day experience to include a tour of the Water Recycling Facility and day at nearby Bigbreak Regional Shoreline Park.

"On the first day, one school came to our facility while the other went to the park," says Gehlke. "On the second day, we switched. The focus throughout was on clean water." Teachers and principals came in ahead of time for facility tours; the teachers then prepared the kids with lessons about the water recycling facility and its processes.

“This wasn't just a made-for-fun event. The principals and teachers wanted to make sure it was educational because wastewater is among the things they talk about in sixth-grade curriculum.”

RONI GEHLKE

DOING IT WHOLESALE

The tour logistics were challenging; the solution was creative. Since the facility opened, the district had offered hayride tours of the grounds. The school tours combined hayrides with visits inside the buildings to observe the key processes.

Groups of 28 kids at a time, with teachers and parent chaperones, walked the mile-and-a-half from their schools to the plant site, where they boarded the hay wagon to begin 45-minute tours. "We had somebody from each school at the pickup sites with cellphones making sure all the kids were arriving on time," Gehlke says. "Everything worked very smoothly."

Because two days of tours would have taken too much time from facility operators' work, the district brought in as tour guides four students from



Ammar Hammauche, Bay Area Consortium of Water and Wastewater Education (BACWWE) student, leads sixth-graders from Delta Vista Middle School on a plant tour.

the Bay Area Consortium of Water and Wastewater Education (BACWWE), a partnership of clean-water agencies and Solano Community College that aims to educate a new generation of operators.

The BACWWE students toured the Ironhouse facility and then staffed tour stops focused on aeration, microfiltration, UV disinfection and biosolids processing. Gehlke provided them with scripts containing information the teachers wanted the kids to learn. The kids saw samples of dried biosolids and were allowed to touch a sample of filtration membrane.

NOT JUST A LARK

“The kids asked great questions — things we weren’t expecting to hear from that level,” says Gehlke. “They asked what kind of bacteria we use for treatment. Some wanted to know what exactly the membranes were made of.”

Each child had a journal in which to take notes about the visit to be used later in writing a report. “This wasn’t just a made-for-fun event,” says Gehlke. “The principals and teachers wanted to make sure it was educational because wastewater is among the things they talk about in the sixth-grade curriculum.”

The kids also received a question-and-answer sheet, a short write-up on filtration, and pictures of the plant, along with items such as puzzles and word searches, which some teachers let the students use for extra credit.

All in all, the event was a hit with the kids, and the school system will repeat it this year during the week of Earth Day (April 22). “The teachers appreciated it,” Gehlke says. “I think the fact they’re doing it again shows it worked for them. If they thought the kids didn’t get something out of it, they wouldn’t be coming back this year.”

PART OF THE PLAN

The tour program fit perfectly with the Ironhouse district’s outreach mission. “In California, water issues are really paramount,” says Davisson. “We want to be influential in shaping the next generation so they understand the importance of water sustainability and how our services can help with that.

“It’s exciting to reach kids at an age when they’re just beginning to gain an awareness of environmental issues and start impressing on them the importance of reuse and responsibility, so that it becomes second nature to them. It goes beyond giving tours and into supporting the schools so that they can take information back and incorporate it into their lesson plans.”

Gehlke adds, “It was great to work with the schools and provide an opportunity for the kids to walk through and see what we do. We’re a small district. Our experience shows that there are ways for districts our size to accomplish tours like these.”

It’s environmental education — not one, not 10, but 700 students at a time. **tpo**

RECYCLING IN ACTION

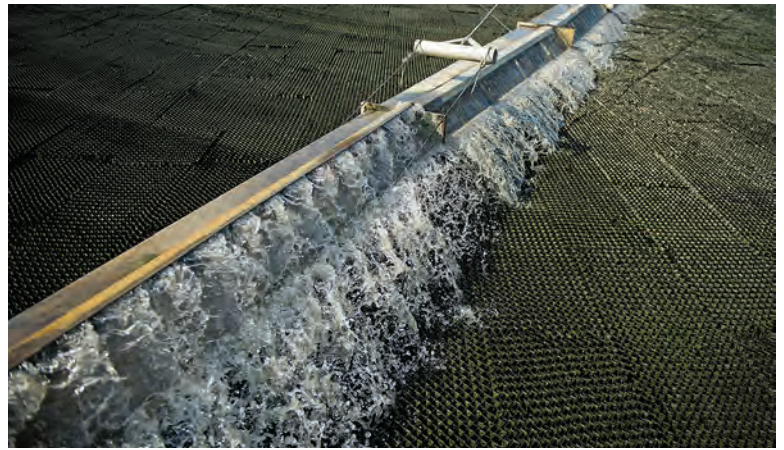
The kids who toured the Ironhouse Sanitary District Water Recycling Facility got to watch trucks filling up at one of the district’s two recycled water fill stations.

In 2015, the district opened a fill station where commercial users can receive water for purposes like construction grading and compaction, and landscape irrigation. On the tour days, trucks were picking up water for dust control on a freeway construction project in the area.

The other fill station lets residents tap into recycled water at no charge to irrigate their lawns, plants, trees and gardens.



The tours included almost all the sixth-graders in the Oakland school system.



Wastewater at the M'Kean Maffitt plant is filtered through synthetic media in a high-rate trickling filter.

Age Is *No Barrier*

A TRICKLING FILTER PLANT AT CAPE FEAR PUBLIC UTILITY KEEPS CHURNING OUT QUALITY EFFLUENT THROUGH SOUND MAINTENANCE AND JUDICIOUS UPGRADES

STORY: **Jim Force**

PHOTOGRAPHY: **Andrew Craft**

MAYBE YOU CAN'T TEACH AN OLD DOG NEW TRICKS, BUT THAT DOESN'T MEAN AN OLD TREATMENT plant can't keep up with the times.

In fact, the Cape Fear Public Utility Authority's M'Kean Maffitt Wastewater Treatment Plant produces exceptional effluent, withstands frequent hurricanes, and wins awards, even though its original trickling filter and other equipment are 45 years old.

"Our trickling filters are pretty robust," says Milton Vann, supervisor of the plant in Wilmington, North Carolina. "The original one dates to 1972, and the second one was added in 1986. Through all those years, we've never been out of compliance, except for high flows during storms."

A meticulous operations and maintenance program, implemented daily by a dedicated staff, is the key to longevity. "We've had the insight not to just apply Band-Aids," says Vann. "We do it the right way and repair things to last another 40 to 50 years. We've received budgeting from upper management to take care of issues when we see them."

OLD BUT EFFECTIVE

The Maffitt plant, named for former engineer M'Kean Maffitt, is one of two main wastewater treatment plants in greater Wilmington. It serves 68,000 people on the south side of the city, plus Wrightstown Beach and a portion of New Hanover County. Its design capacity is 12 mgd; flows average 6 to 7 mgd.

Collected through a 1,000-mile sewer system, wastewater enters the plant through mechanically raked bar screens, a grit rake and degritter. Then it passes through a distribution chamber that controls the flow to one of two circular primary clarifiers. Treatment continues in one of two trickling filters.

The older unit uses rock media, while synthetic media fills the newer trickler. Bed depth is 6 feet, and the sprinkler arms extend 180 feet end to end. The two media types perform similarly. "We've run lots of tests, and the performance of each filter is about the same — both very good. There are only marginal differences.

"While the primaries and chlorination date back to the beginning, most of the mechanisms are not original, we've replaced them with newer equipment. The filters have provided good service over the years and are excellent at handling shock loads. They're our first line of biological treatment."

Trickling filter effluent is given a biological polish in a small aeration basin before disinfection with chlorine gas. The basin occupies a former secondary clarifier and is equipped with coarse-bubble diffusers. After disinfection, effluent is dechlorinated with sodium bisulfate and discharged to the Cape Fear River.

QUALITY WATER

Effluent quality is excellent. The plant has a permit of 25 mg/L for CBOD, and reports a level of 5-6 mg/L. Likewise, the TSS limit is 30 mg/L and the effluent is in the range of 4-5 mg/L.

The team at M’Kean Maffitt (Southside) Wastewater Treatment Plant includes, from left, Steven Styers, operations supervisor; Jason Scott, utility maintenance technician; David Baggett, process operation; Robert Gunter, control operator; Milton Vann, plant supervisor; Matt Wiencek, control operator; Jeff Flowers, facilities specialist; Randall Turley, process operator; Todd Childers and Darryl Tindall, utility maintenance mechanics; and Brenda Williams, administrative support specialist.





Darryl Tindall, utility maintenance mechanic, services a pump in the primary sludge pump station.

M'Kean Maffitt Wastewater Treatment Plant, Cape Fear Public Utility Authority, Wilmington, North Carolina



BUILT: | 1972

EMPLOYEES: | 14

FLOWS: | 12 mgd design, 6-7 mgd average

POPULATION SERVED: | 68,000

TREATMENT LEVEL: | Secondary

TREATMENT PROCESS: | Activated sludge

BIOSOLIDS: | Land-applied

RECEIVING STREAM: | Cape Fear River

ANNUAL BUDGET: | \$500,000 (operations)

WEBSITE: | www.cfpu.org

GPS COORDINATES: | Latitude: 34°9'55.06"N; longitude: 77°56'46.58"W

“That’s absolutely amazing for a trickling filter plant,” says Vann.

Anaerobically digested biosolids (digester capacities 500,000 gallons to 1 million gallons) are sent to gravity thickeners (Ashbrook Simon-Hartley) and pressed to a dry cake on belt presses (Andritz). The Class B material is spread on farmland. A lime stabilization system is on standby and can be used to produce Class A biosolids if necessary.

A second treatment plant on the city’s north side, named after another former engineer, James Loughlin, is rated for advanced treatment at 16 mgd capacity. Some flow diversion between the two plants keeps the Maffitt plant

flows at or below design. The plant is staffed around the clock. The operations team is assisted by a central maintenance crew employed by the Cape Fear authority. A SCADA system monitors and controls plant processes.

This old-timer will get some new looks in the future. An expansion and upgrade is in the works. A design by the firms of McKim & Creed, and Hazen and Sawyer is about 90 percent complete. “It was scheduled earlier, but the recession reduced building and growth in the area and the project was postponed,” says Vann. The improvements will increase plant capacity to 16 mgd and enable future expansions to 24 mgd.

SOPHISTICATED MAINTENANCE

Like human beings, treatment plants need checkups from time to time to maintain good health, and the Maffitt plant has an exceptional program. The emphasis is on predictive maintenance, which calls for daily, monthly, semi-annual and annual monitoring. “As an older plant, we have to be more conscious of predictive maintenance,” Vann says.

To prevent catastrophic failures, the staff regularly prepares assessment reports, and an engineering firm has come in to give the plant a heads-up on potential problems. The maintenance program is computerized and reports required maintenance items for the operations supervisor, Steve Styers, each morning.

Styers assigns the tasks to operators who conduct checks on their equipment on each shift, listening for noise and looking for abnormal operations. Ben Silvester, central maintenance supervisor, assigns tasks to the maintenance staff. “We do lots of visual inspection, and our maintenance team does a great job of handling the day-to-day operations,” Vann says.



Matt Wiencek, control operator, collects an effluent sample.

“ We’ve run lots of tests, and the performance of each filter is about the same — both very good. There are only marginal differences.”

MILTON VANN

Vann points to a potential bearing failure in one of the secondary clarifiers a few years ago. Through the predictive maintenance program, the staff was able to detect the trouble and rebuild the bearing before it went out.

IN HARM’S WAY

Wilmington and its treatment facilities are smack in the middle of Hurricane Alley. Storms frequently roar up the east coast of the U.S. As a result, Vann and his staff have dealt with huge storms. They also spend a good deal of time on emergency preparedness.

Vann says the good thing about hurricanes is that they are predictable. That enables the plant staff to be proactive: “We can see it coming and can track it.” Storm precautions include lowering the levels in the digesters and the wet-end basins to add capacity for storm flows, which have run as high as 30 mgd. “We don’t want solids going over the weirs,” says Vann.

The operators also check the diesel-fired generators weekly to make sure they are ready to go if needed. The plant often switches to generator power in advance of a storm just to make sure everything keeps running if and when the main power supply goes out.



Biosolids cake moves through a belt filter press (Andritz Separation).

The authority also sets up emergency contact centers, and operators and upper management can communicate via cellphone and radio. In advance of severe weather, additional operators are positioned at the plant and prepared to ride it out. That way, no one has issues trying to get into or out of the plant in bad conditions.

(continued)



“We’ve been very fortunate in that we’ve had no Category 4 or 5 storms come through. ... Our approach is to be prepared, let it come in and roll out, and keep everything inside our walls.”

MILTON VANN

Despite their age, the plant’s trickling filters deliver high-quality treatment.

**M’Kean Maffitt Wastewater Treatment Plant
PERMIT AND PERFORMANCE**

| | INFLUENT | EFFLUENT | PERMIT |
|-------------|----------|----------|---------|
| CBOD | 160 mg/L | 5-6 mg/L | 25 mg/L |
| TSS | 170 mg/L | 4-5 mg/L | 30 mg/L |

“We’ve been very fortunate in that we’ve had no Category 4 or 5 storms come through,” Vann says. “Probably the worst we’ve had was the combination of Fran and Bertha a few years ago. They hit us back to back and did a lot of damage. Our approach is to be prepared, let it come in and roll out, and keep everything inside our walls.”

EARNED RECOGNITION

The attention to detail and careful planning at the Maffitt plant hasn’t gone unnoticed. In 2015, the facility won the North Carolina Eastern Section WEA-AWWA award for operations and maintenance. And the plant was recently honored with certification under the state Department of Labor’s Safety and Health Achievement and Recognition Program (SHARP). The program honors organizations that develop and maintain good worker safety programs.

“We received these awards in recognition of our record of excellence for such an old facility,” says Vann. “They are a sign of accomplishment and a shot in the arm for everybody. It was the result of having phenomenal support of management and staff, and it showed that good old hard work pays off.” tpo

featured products from:

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

Envirosight
866/936-8476
www.envirosight.com

POSM Software
859/274-0041
www.posmsoftware.com

GOOD PEOPLE

The Cape Fear Public Utilities Authority was proud to have three of its staff honored recently by the North Carolina AWWA-WEF section:

- Robert Daughtry as Wastewater Collections Operator of the Year
- Jim Tayson as Water Distribution System Operator of the Year
- Michael Richardson for his work in disaster preparedness

A background in construction and piping led Daughtry to a key position in the collections division. His work in operations, maintenance and data tracking led to his award. He was honored for “being diligent about and doing outstanding work in tracking and reporting,” as the utility complies with requirements of a consent decree.

Daughtry, as collections system supervisor, is responsible for more than 1,000 miles of sewers and 143 pumping stations. His team aims to video-inspect 20,000 feet of the system and clean at least 10 percent each year. The utility uses EnviroSight cameras and POSM Software.

Tayson, supervisor of water distribution and construction, has been with the city since 2004. Under his leadership, the department has made several changes in operations, notably flushing and valve maintenance practices that have improved performance and produced some of the lowest disinfection byproduct numbers the system has ever recorded. “We’re an older community,” he says. “Our biggest challenges are related to our aging infrastructure and trying to keep up with the latest technologies to hold our system together.”

Richardson is now retired, but his award was noteworthy since the North Carolina section has always honored a utility, not one person, for disaster preparedness. At the time, he was the utility’s water resources manager. The award cited him for advancing disaster preparedness, and thereby strengthening the utility’s ability to withstand a disaster.

SEEPEX.
ALL THINGS FLOW

UNMATCHED STABILITY FOR PROCESS CONTROL

Our ALPHA chemical metering systems – complete with SEEPEX’s progressive cavity pumps and controls – offer customers simple plug-and-play installation. They are used in a variety of water treatment applications including disinfection, pH control, coagulation and flocculation. ALPHA minimizes the amount of ancillary equipment, which reduces failure potential, complexity and cost. All wetted materials within the system are corrosion resistant and reliable.

CONVEYING CAPACITY
UP TO 250 USGPH

PRESSURE
UP TO 175 PSI



ADDITIONAL BENEFITS

- NSF/ANSI 61 certified Intelligent Metering Pumps with accurate and repeatable flow
- Minimal pulsation and tighter controls
- No vapor lock

Contact us to purchase your chemical metering system.

SEEPEX Inc.
sales.us@seepex.com
T +1 937 864-7150
www.seepex.com

FREE INFO – SEE ADVERTISER INDEX

Everyone
talks about
creating a
greener
environment.

You actually *do it*.

Find the tools you need to keep
your communities **green** at
www.colepublishing.com.

Publishing environmental trade magazines since 1979.

WATER & WASTEWATER TREATMENT EQUIPMENT



- Reverse Osmosis and Nanofiltration
- Microfiltration and Ultrafiltration
- Pressure Media Filters
- Gravity Media Filters
- Ion Exchange Systems
- Softening Systems
- GAC Contactors



Water.
Process.
Solutions.

1.800.240.3330

WIGEN.COM



FREE INFO – SEE ADVERTISER INDEX



Lake Mission Viejo.

That Extra Measure

TREATED RECLAIMED WATER FILLS POPULAR MAN-MADE RECREATION LAKE AND PROTECTS THE DRINKING WATER SUPPLY IN DROUGHT-STRICKEN CALIFORNIA

By Doug Day

People around Lake Mission Viejo in California now fish, swim and water ski in treated reclaimed wastewater. It comes from the Advanced Purified Water Project, a \$5.4 million facility built to end the use of scarce drinking water to fill the 124-acre man-made lake.

The 0.6 mgd plant opened in October 2016 and will replace about 500,000 gallons lost daily to evaporation from the lake, whose only natural water source is rain. When not needed for the lake, the purified water will be added to the Santa Margarita Water District's reclaimed water system.

SAVING POTABLE WATER

The privately owned reservoir serves more than 35,000 members of the Lake Association homeowners group that encompasses the city of Mission Viejo. Members pay an annual fee for access to the lake, built in the mid-1970s.

"The lake was the centerpiece of this master-planned community," says Don Bunts, water district deputy general manager. "A major drought was occurring then, and Gov. Jerry Brown was adamant that no potable water would be used to fill the lake." It was eventually filled from a variety of sources, and after the drought lifted, drinking water was used to keep it full.

"Gov. Brown is now in office for a second time and we're in a drought," says Bunts. "The governor has again identified specifically that this was not a good use of a very valuable and limited resource."

COMPREHENSIVE TREATMENT

The purification plant draws reclaimed water from the district's three wastewater treatment plants and first puts it through a microfiltration system (Wigen Water Technologies) to remove suspended solids, bacteria and most viruses. A reverse osmosis system (Wigen) removes minerals, dissolved chemicals, viruses and other impurities. The water is then UV disinfected.

"There's a variety of chemical additions we're making," says Bunts. "That's basically to balance out the pH after the RO process so it's not such an aggressive water. We add ferric chloride at the front end to take out some of the phosphorus and nitrogen. We're also going to add ion exchange for nitrate removal. If we have excursions from what the Lake Association feels are acceptable values, we can divert the flow through ion exchange so we're not creating a nutrient-rich environment for algae blooms."



Ultrafiltration is key to the advanced purification process. Recycled water passes through ultrafiltration membrane modules (Scinor).



The plant's reverse osmosis system (Wigen Water Technologies).

District engineers designed the plant to provide up to 600 acre-feet per year, but it's only needed when the lake level diminishes from evaporation. When not used to replenish the lake, the purified water goes back to the district's growing reclaimed water system, which provides nearly 100 million gallons a year for local irrigation.

"If and when some other users want that higher-quality water, we would make it available," says Bunts. "It doesn't now make sense to build 2 miles of pipe. It isn't cost-effective at this juncture."

PUSHING INNOVATION

Unlike reclaimed water that is distributed in purple pipes and includes warning labels, the lake has only advisory signs. "To err on the conservative

side, be transparent, and make sure everyone's aware of it, we have posted signs so that people know that we are using advanced purified water to fill the lake," says Bunts.

The plant was built by W.M Lyles Construction and completed in only eight months after project approval. Bunts credits the district board for its progressive approach. "All along, even before this project, they are always open and even pushing the staff to develop innovative ways to address our water-supply issues," Bunts says.

“Every use may not need the same level of treatment or the same process, but providing boutique or designer water is the future. It increases the ability to use recycled water in other applications.”

DON BUNTS



Workers place the facility's ultrafiltration skids.

"Outside of recycled water, we are 100 percent dependent on imported water. They understand the significance of securing additional supplies, because of drought and, more important, the potential for an earthquake or some other calamity that could sever our supply from northern California or the Colorado River. By developing local sources, we build reliability for our customers."

STRONG SUPPORT

Knowing that people have some reticence about reclaimed or recycled water, the homeowners association educated its members about the plans and the process to be used. The vote of the plan was unanimous with 91 percent of the eligible members participating. "It's a testament that people are becoming more comfortable with the idea of recycled water and understand the technology and realities of the water situation here," says Bunts.

The next question was paying for it. "The district serves a much greater

area than just the city of Mission Viejo and the lake," Bunts says. "We didn't feel it was appropriate for the rest of our ratepayers to pay for this project. The Lake Association opted to guarantee payment of all of the capital costs over 25 years and pay any additional costs for the treatment."

The city also provided a grant of \$1 million along with a \$3 million low-interest loan to be paid off over 20 years at 2.5 percent interest. In exchange, the city will receive enough recycled water to irrigate about 80 percent of its parks and medians for 25 years at a discounted price.

The purified water is more expensive than drinking water from the State Water Project and the Colorado River Aqueduct — about \$1,600 per acre-foot versus \$950. "Once we pay off the capital cost, it will be less expensive," notes Bunts. "And we can control the variables we can't control with our wholesale drinking water retailer, so we feel long-term that we'll be able to keep the costs lower than for potable water."

SIGN OF THINGS TO COME

Because of the drought and general scarcity of drinking water, California is a leader in reuse and recycling. The Mission Viejo project is an example of the possibilities. "Every use may not need the same level of treatment or the same process, but providing boutique or designer water is the future. It increases the ability to use recycled water in other applications," Bunts says.

He cites examples that include wider use in cooling towers. Reclaimed water is already popular with golf courses, but some may want further treatment. "In one location here, they're looking at putting in a small plant just to water the greens," Bunts says. "You can use the better-quality water on the more delicate grass."

California is also looking at pilot projects to test other processes for direct and indirect potable reuse to help preserve its drinking water supplies. **tpo**



Exam anxiety got you down?

Get help on sticky questions with our Exam Study Guide.

An online exclusive. Visit tpomag.com | **tpo**

THE RIGHT CHOICE

BRYAN LEIGHOW IS GLAD HIS CAREER PATH LED TO THE CLEAN-WATER PROFESSION. HE FINDS ENDLESS VARIETY AND GREAT SATISFACTION IN PRODUCING QUALITY EFFLUENT.

STORY: **Trude Witham** | PHOTOGRAPHY: **Denny Medley**

CHIEF OPERATOR BRYAN LEIGHOW WAS SURPRISED WHEN HE WON the 2015 Operator of the Year award from the Missouri Water Environment Association in the small plant division: “I’m kind of a quiet person, so the award was a big deal to me.”

After 23 years in the industry, his recognition is well deserved. Since 2014, he has worked at the Oak Grove (Missouri) Wastewater Treatment Facility and has strived to optimize plant performance. “We’ve done a lot of fixing up and have added some new equipment in the past few years,” he says.

The plant team has reduced electricity costs by 23 percent over the last three years by running equipment more efficiently, using energy-efficient lighting and monitoring energy use. A switch from propane to electric heat in the headworks and motor control center buildings also saved money.

The 1.3 mgd extended aeration plant, built in 2006, serves about 8,000 residents. Leighow is proud of the effluent quality: The process removes 96 percent of BOD and 97 percent of TSS.

HIGHLY MOTIVATED

Leighow credits his mentors for much of his success. “I was nominated for the WEA award by someone outside the city who I worked with in Blue Springs, Missouri,” he says. That was Jeff Shook, who used to be the city’s Public Works director and Leighow’s mentor.

“Jeff and my other two bosses, Jeff Mock and Roger Moerke, taught me the right way of going about things, and we’re still friends,” he observes.



Bryan Leighow, chief operator, Oak Grove (Missouri) Wastewater Treatment Facility

Leighow started at the city of Blue Springs in the parks department, moved to the street department, and then worked in water distribution before moving to the wastewater treatment plant as a laboratory technician and operator. “I took laboratory classes, studied to get my class D wastewater license, and then eventually my class A license,” he says. “When the neighboring town of Oak Grove needed a chief wastewater operator, I got the job.”

He is certified in OSHA site safety, accident prevention, construction and estimating, technical mathematics and AutoCAD. He took advanced activated sludge and extended aeration courses from the University of Colorado. He has taken classes through the Missouri Water Environment Association, WEF and the state Department of Natural Resources.

DOING IT ALL

Today, Leighow does everything at the plant and shares duties with operator Jordan Reinbold: “Jordan has been here for three years. I trained him when I came on board, and I love sharing knowledge with him.”

Says Reinbold, “Bryan is a great mentor and I’ve learned a lot from him over the last couple of years. He explains things in a way that I can understand, and he’s very patient and thorough.”

They work 7 a.m. to 3:30 p.m. Monday through Friday. On-call staff members from Public Works

do a walkthrough and gather information and readings on weekends and holidays. The operators handle scheduled maintenance such as equipment greasing, pump inspection and blower oil changes. They also mow and trim



“I want the plant to be the best it can be, and I want it right now. Having to wait for something you know will make the plant run more efficiently is hard.”

BRYAN LEIGHOW



ABOVE: Leighow performs a microscopy study.
 LEFT: The team at Oak Grove includes, from left, Bryan Leighow, chief wastewater treatment plant operator; Jordan Reinbold, treatment plant operations; and Larry Hensley and Tanner Hipsher, public works operations.

Bryan Leighow, Oak Grove (Missouri) Wastewater Treatment Plant



POSITION: | **Chief operator**

EXPERIENCE: | **23 years in the industry**

AWARDS: | **2015 WEA Operator of the Year, American Public Works Association (APWA) awards for large equipment operation (1998, 2000, 2002, 2004-2006)**

CERTIFICATION: | **Class A Wastewater Operator**

GOAL: | **Retire in three to five years**

GPS COORDINATES: | **Latitude: 39°0'18.03"N;
 Longitude: 94°7'45.81"W**



Jordan Reinbold uses a dissolved oxygen meter (Hach) as Bryan Leighow records results.

the grass. They run BOD, TSS, *E. coli*, pH, ammonia, hardness and metals tests in the on-site lab. “We do all our own lab work except for oil and grease testing,” Leighow says. “It takes a full day to set up the lab, collect the samples and run the tests.”

Major plant equipment includes:

- Step screen (Huber Technology)
- Grit removal (John Meunier - Veolia Water Solutions & Technology)
- Diffusers (Environmental Dynamics)
- UV disinfection (WEDECO - a Xylem Brand)
- Pumps and mixer (Flygt)
- Dissolved oxygen meter and probe (Hach)
- Sudorbilt blowers (Gardner Denver)

UP WITH EFFICIENCY

The SCADA system with InduSoft software (Wonderware by Schneider Electric) lets the operators monitor the plant, lift stations, water stations and towers. Effluent is pumped to the head of the plant for grit removal and dewatering press washing. Discharge is to an unnamed tributary of Sni-A-Bar Creek.

Biosolids are pumped to two treatment cells and eventually land-applied. “Surrounding farms use the biosolids,” Leighow says. “A subcontractor runs

a line from the cells to the fields, and the biosolids are injected under the surface with a chisel plow.”

Energy efficiency measures include operating only one clarifier, running the blowers at the lowest setting, and switching from halogen to LED lighting. “West Central Electric set us up on a program where we can go online and look at our average energy use by the hour, month or year,” Leighow says. “That tells us what it costs to run different pieces of equipment. For instance, we now use our waste pumps mostly during off-peak hours.”

Operators run the blowers according to influent dissolved oxygen, uptake rate, and mixed liquor and clarifier dissolved oxygen. Leighow explains, “We keep our DO at the lowest we must have to operate. One of the most overlooked things is the over-aeration of a plant, which directly affects money spent on electricity.”

“The plant has also changed out defective diffusers to keep everything in a fine aeration state. A lot of times, this can make a difference, rather than switching another blower in service for just that little bit of required DO.”

The switch from electric to propane heat in a few areas has also made a difference. “Our propane units are larger in order to heat bigger areas at higher temperatures. These units are very expensive to run and to work on. But, the headworks and MCC buildings do not need to be heated at higher temperatures, since anything above freezing is sufficient,” Leighow says.

He plans to switch to variable-speed drives at the pump station in the next few years. He’s also considering solar or wind power: “We’re looking at the pluses and minuses, and figuring out where we would put this equipment.”

FARMING THE BUGS

Leighow enjoys the science behind wastewater treatment. “What I find most rewarding is seeing what comes in and what we’re releasing to the stream,” he says. “The biological aspect is interesting. We’re really glorified bug farmers.”

He finds budget constraints frustrating: “I want the plant to be the best it can be, and I want it right now. Having to wait for something you know will make the plant run more efficiently is hard. These things, like variable-frequency drives, can be costly.”

He looks forward to upgrades in the next three years: new grit removal and SCADA systems, new flowmeters, clarifier covers to keep out the algae, and a new non-potable water system.

Challenges include inflow and infiltration from cracks in old pipes, leaking or flooded manholes, and residential sump pumps. “We allot a certain amount of money every year to address this, and we treat the worst cases first,” he says. Solutions range from lining sewers and manholes to total replacement. The city manages to stay on top of it.”

The plant also deals with power outages from storms, relying on a diesel-powered 475 kW backup generator (Onan Corporation). “That unit is run on a two-second delay for any power outages and performs a test cycle every week for 15 minutes.”

Leighow finds it useful to network with operators from similar facilities in the area to discuss topics such as equipment upgrades. He also attends local seminars and trade shows: “I go to those that I can learn from or haven’t been to yet. And it’s also where I pick up the required hours for my wastewater license.”

If he had to do it over, he would choose the profession again. “Although there are many things that interest me, this job offers a lot of variety,” he says. “Anyone who runs a plant knows that changing one thing directly affects something else. It can sometimes be difficult to obtain the best effluent quality at the lowest operating cost; that is a challenge I enjoy.”

“Bryan is a great mentor and I’ve learned a lot from him over the last couple of years. He explains things in a way that I can understand, and he’s very patient and thorough.”

JORDAN REINBOLD

featured products from:

Environmental Dynamics International
573/474-9456
www.environmentaldynamics.com

Flygt - a Xylem Brand
855/995-4261
www.xylem.com/pumping

Gardner Denver Inc.
866/376-8181
www.gardnerdenver.com/gdproducts.com


Hach
800/227-4224
www.hach.com
(See ad page 3)

Huber Technology, Inc.
704/949-1010
www.huberforum.net
(See ad page 9)

Schneider Electric - Invensys
949/727-3200
http://software.schneider-electric.com

Veolia Water Solutions & Technologies North America
312/552-2887
www.veoliawatna.com

WEDECO - a Xylem Brand
855/995-4261
www.xylem.com/treatment



When not at work, Leighow enjoys spending time with his family and treasures days in the field fishing and hunting.

FAMILY MAN

Once the planned upgrades are complete, Leighow would like to start giving plant tours to student groups. "I worked with the Grain Valley schools when I was at the Blue Springs plant," he says. "They would bring in the science classes, and I'd set up microscopes in the lab and show them what we did."

Leighow feels the tours give students a better perspective than they can get in the classroom: "I really do enjoy teaching kids and seeing the lights go on."

In the meantime, his greatest satisfaction is serving the people of Oak Grove. He is also proud of his family. "My daughter, Bailey, is at Grain Valley High School and wants to be a doctor and work with Doctors Without Borders," he says. "My son, Brenton, is attending Avila University on a football scholarship. He plays defensive end and is studying kinesiology. He wants to be involved in sports medicine as a physical therapist."

Says Bailey, "Dad has shown us that we can do anything we set our mind to, and that we should expand our knowledge about life and the world."

Brenton recalls, "My dad always told me when we were hunting together to enjoy all the small things in life, and to take a deep breath and look at all the beauty around me." **tpo**

OUTDOOR ADVENTURES

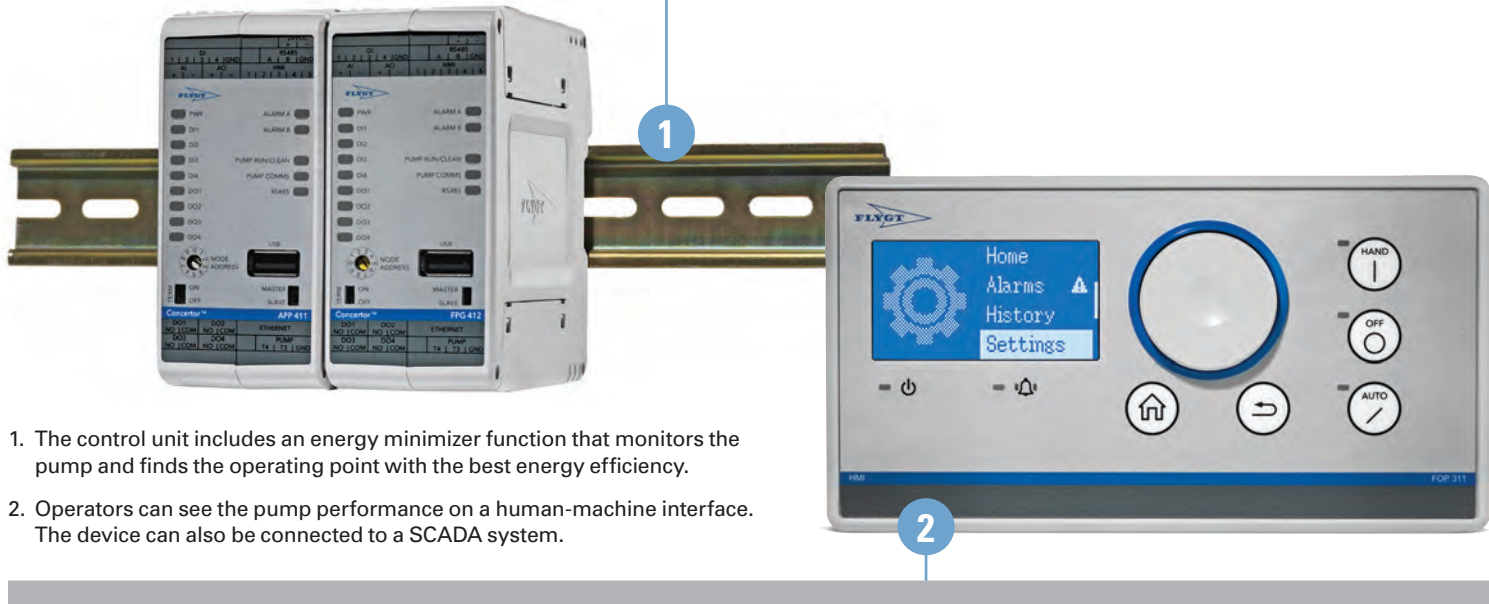
When Bryan Leighow isn't working hard as chief operator at the Oak Grove Wastewater Treatment Facility, he enjoys fishing and deer hunting on the family's farm in Bosworth, Missouri.

He also likes to hunt wild hogs, pheasant, quail and chucker. "We have six large ponds and one small lake where my father-in-law has stocked and raised bass, crappie, catfish and perch," Leighow says.

An archer for 28 years, he hunts with a compound bow. The sport can be frustrating: "I may never see anything, but just being out in nature gives me time to reflect."

If you're ever at the Oak Grove plant, you might want to ask him about his wild hog hunting story: "It almost ended up with the hog getting a taste of me rather than the other way around!"

Leighow plans to retire in three to five years. "That will give me more time for RV travel with my wife and for enjoying our antiques and collectibles store in Warrensburg," he says. "It's called Those Were the Days and is one of the largest of its kind in the state."



1. The control unit includes an energy minimizer function that monitors the pump and finds the operating point with the best energy efficiency.
2. Operators can see the pump performance on a human-machine interface. The device can also be connected to a SCADA system.

Smart Pumping

FLYGT CONCERTOR SYSTEM FOR WASTEWATER APPLICATIONS IS DESIGNED TO MINIMIZE ENERGY USAGE, REDUCE PUMP STATION CLEANING COSTS, AND SHRINK PUMP INVENTORIES

By Ted J. Rulseh

Wastewater pumping stations can be prone to pump clogging and inefficient energy consumption. They can also require frequent cleaning by way of waterjet/vacuum trucks.

Now Xylem has introduced the Concertor pumping system with integrated intelligence.

The system, from the Flygt brand, is designed to sense conditions in its operating environment, adapt its performance in real time, and provide feedback to station operators.

The manufacturer says the system can simplify the pumping process from selection, installation, commissioning and monitoring in a package with a compact footprint. The company reports that field tests around the world have validated benefits that include up to 70 percent energy savings when compared to conventional pumping, up to 80 percent lower pump inventories, and up to 80 percent savings on vacuum cleaning of lift stations.

The system can be used with wastewater pumps from 3 to 10 hp. It combines IE4 motor efficiency with the company's Adaptive N-hydraulics, integrated power electronics and intelligent controls. It includes an automatic cleaning cycle that helps prevent clogging. Christian Wiklund, vice president and director of product development for Xylem's Flygt products, talked about the technology in an interview with *Treatment Plant Operator*.

tpo: What was the reason for bringing this offering to the market?

Wiklund: Our guiding force is to develop products that have the lowest life cycle cost. In line with that, we have three principles: Reliability, sustainable energy efficiency, and ease of installation and operation. For reliability, we developed the anti-clog function. On sustainable energy efficiency, we combined our advanced Adaptive-N hydraulics with IE4 motor efficiency. We also included an energy minimizer function that continu-

“The cleaning cycle may take one second, or one minute, or 10 minutes. In any case, that is much faster than sending two service technicians to pull the pump and unclog it.

CHRISTIAN WIKLUND

ously monitors the pump to find the operational point that requires the least energy consumption.

tpo: How does this technology help users reduce their pump inventory?

Wiklund: The pump industry is built around the idea that a consultant calculates the duty point needed in a specific pump station in terms of head and flow. Then the customer orders pumps to meet that duty point. That means many variants of pumps are needed to meet multiple duty points in different pump stations.

Concertor doesn't have a specific pump curve or duty point — it has a performance field. So within a specific range of horsepower or head and flow, a Concertor automatically finds the optimum duty point with the lowest possible energy usage. So instead of having numerous versions of pumps for different duty points, the user can have this pump in stock as a spare and know that it will most likely work. For big customers, this provides a major value by enabling them to reduce their inventory.

tpo: How does the anti-clog function operate?

Wiklund: If a rag enters the pump and gets between the impeller and

AllMax Software can save you time and make your job *easier!*

Contact us today to find out *how.*



Antero™
Maintenance



Operator10®
Wastewater &
Water



Synexus™
Pretreatment

AllMax
Software

Over 20 YEARS
Specializing in
Software & Service

800-670-1867 www.allmaxsoftware.com

FREE INFO – SEE ADVERTISER INDEX

the insert ring, that increases the motor torque. When the torque increases, so does the current to the motor. That triggers a cleaning cycle. The pump stops very quickly so that the rag does not get stuck. The pump then starts operating at different speeds and directions — it goes backward and forward until the rag has passed through. The cleaning cycle may take one second, or one minute, or 10 minutes. In any case, that is much faster than sending two service technicians to pull the pump and unclog it.

tpo: How does the energy minimizer locate the point of lowest consumption?

Wiklund: On the first pump cycle, when the pump is triggered to start by an inflow to the pump station, the pump will run at 60 Hz. On the next cycle, it will run the pump at 59 Hz, and measure and compare the energy consumption between the two speeds. If operating at 59 Hz reduces consumption, the next pump cycle will be at 58 Hz. The process continues until energy usage reaches the lowest level and starts to increase. This function alone in many cases can save up to 50 percent on energy.

tpo: How does this speed variability compare with using variable-frequency drives?

Wiklund: An issue with variable-frequency drives in many cases is that they can break down due to heat, dust and other environmental conditions. The drives need cooling and fresh air. With Concertor, the power electronics are built into the pump. Since the pump is submerged, it has very good cooling and no exposure to air pollution. That makes for a very reliable system.

tpo: What enables this system to reduce the need for pump station vacuuming?

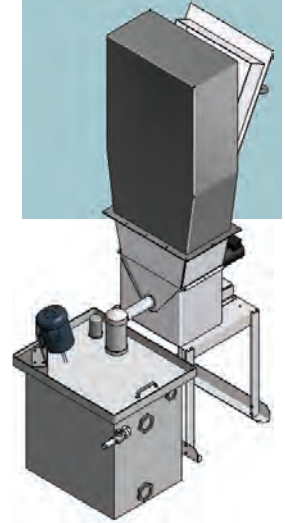
Wiklund: In a typical pump station, pump starts and stops are trig-

FEED IT!

The Eagle Microsystems VF-100 Dry Chemical/Polymer Feeder is rugged, simple to use, and very versatile. Available with a wide range of options and accessories, the VF-100 can fit any dry feed application!

FEATURES:

- Direct drive
- Flex-wall agitation
- Accurate SCR speed control
- Stainless steel construction
- 2 year warranty
- Multiple configurations



eagle
MICROSYSTEMS

YOUR SOURCE FOR PRECISION PROCESS SOLUTIONS

800.780.8636

EAGLEMICROSYSTEMS.COM

FREE INFO – SEE ADVERTISER INDEX

gered by level switches, so that the pump always starts and stops at the same water level. This means floating debris, fats and grease stay on the surface of the water and can build up on the walls over time. Concertor uses a pressure sensor and alternates the start and stop levels. In addition, at certain intervals, the system pumps down to the level of the inlet and removes all the floating material.

tpo: How do pump station operators interact with the system?

Wiklund: The system has multiple communication protocols built into it. Operators can see the pump performance on a human-machine interface, or it can be connected to an existing SCADA system. It can also be connected to the cloud. The interface shows the current energy consumption and pump speed. It also shows the number of cleaning cycles that have been triggered, and so how many times a traditional pump likely would have clogged.

“The system has multiple communication protocols built into it. Operators can see the pump performance on a human-machine interface, or it can be connected to an existing SCADA system. It can also be connected to the cloud.”

CHRISTIAN WIKLUND

tpo: Apart from pilot testing, what results have you seen on permanent installations of this technology?

Wiklund: We have a total of about 25 installations in Europe, the United States and the Middle East. Those are connected to the cloud, allowing our team to monitor the performance of the pumps. The results have been very positive, and the pumps have been problem-free. We have replaced older Flygt products and also competitive products with the Concertor. **tpo**

Right Measurements, Right Places

EFFECTIVE AND PRECISE CONTROL OF PHOSPHORUS CAN IMPROVE COMPLIANCE AND SAVE MONEY. IT STARTS WITH SMART APPLICATION OF PHOSPHORUS ANALYZERS.

By Ted J. Rulseh

It's no secret that effluent nutrient limits are getting stricter: It's more essential than ever to minimize nitrogen and phosphorus releases that can pollute lakes and streams.

For phosphorus in particular, some clean-water plants are seeing permit limits for the first time; others are seeing their limits made stricter. In either case, operators need to know how to meet the new limits consistently. Will it take a facility upgrade? A simple process adjustment? Something in between?

A good place to start is by measuring phosphorus levels accurately and at the most appropriate points in the process. The resulting information can then help guide a control strategy that helps achieve compliance at a reasonable cost to implement and sustain. But what kinds of analyzers should a given plant use? Where should they be placed?

As national product marketing manager for analysis products with Endress+Hauser, a supplier of process measurement and automation, Tracy Doane-Weideman visits many treatment plants and helps operators deploy instrumentation for maximum benefit. She talked about approaches to phosphorus measurement in an interview with *Treatment Plant Operator*.

tpo: Why is phosphorus measurement so important?

Doane-Weideman: Many communities can't afford to upgrade or expand their plants to comply with new regulations. They need to make their processes more efficient. That means figuring out how to measure and control phosphorus by using online analyzers. Besides ensuring compliance

with an NPDES permit, an optimized phosphorus removal strategy can provide a relatively quick return on investment.

tpo: When dealing with phosphorus, what exactly are facilities measuring?

Doane-Weideman: There are two forms of phosphorus we hear discussed in the field: Total phosphorus, which includes all forms, and orthophosphate, which is the reactive portion. Plants in many states have total phosphorus on their permits. Others have orthophosphate.

tpo: How are these forms of phosphorus measured in the laboratory?

Doane-Weideman: In the test for total phosphorus, a grab sample is digested to break all the phosphorus components down into the reactive form. Then that reactive form is measured in a colorimeter. For orthophosphate, the sample is filtered to remove the phosphorus bound in solids, and then the colorimetric measurement is taken. These are both Standard Methods and U.S. EPA-approved methods.

tpo: Are the measurement methods in online instruments similar to those in the laboratory?

Doane-Weideman: Yes. The challenge with the total phosphorus measurement is that the digestion step can take as long as two hours. For the online methodology, we have to shorten that step. So we take the digestion to 90 percent and then correlate that back to the laboratory measurement. That allows us to shorten the process.

tpo: What is the role of the orthophosphate analyzer?

Doane-Weideman: When treating for phosphorus, the only thing they're really treating is the reactive portion. So at the end of the day, they really want to know how much reactive phosphorus, or orthophosphate, they have. If they have total phosphorus on their permit, what they need to do is measure the orthophosphate and do a correlation.

tpo: What are the most typical applications for total phosphorus analyzers?

Doane-Weideman: The usual application is in



Tracy Doane-Weideman

Measurement of Phosphorus in Wastewater

Total Phosphorus Analyzer
Follows EPA and Standard Methods

- Course 100mm Filter
- Sample + strong oxidizer
- Digested @ 900 °C
- Vandomolybdate (yellow method)
- Color intensity proportional to concentration (colorimetry)

Orthophosphate Analyzer
Follows EPA and Standard Methods

- Multiple filter options depending on measuring point
- Molybdenum Blue (low range)
- Vandomolybdate (yellow method-high range)
- Color intensity proportional to concentration (colorimetry)

Online analyzer measurements follow U.S. EPA and Standard Methods.

facilities that have a lot of combined sewers or have large industrial applications upstream, so that they can experience very large swings in the phosphorus concentration. Most of these plants deploy the analyzer at the headworks before the primary clarifier, or both before and after the primary clarifiers.

tpo: Where are orthophosphate analyzers usually deployed?

Doane-Weideman: Most often at the aeration basins or the final clarifiers, or in both places.

tpo: Can orthophosphate analyzers help with biological phosphorus removal?

Doane-Weideman: Some facilities are equipped to do biological removal by maintaining and controlling certain bacteria in the aeration process. It's difficult, and the most they can usually remove is about 2 mg/L. Phosphorus is necessary for the biology to function properly, so they need to be sure they have enough, and yet not too much to meet the discharge permit. That's where a balancing act comes into play. The best control strategy at that point is to have measuring points pre-aeration and post-aeration, so they can have feed-forward and feedback.

tpo: How does the control loop actually work?

Doane-Weideman: It's flow paced. The pre-aeration measurement is to check and balance the load coming into the facility to determine how much is actually in there and make sure they're returning enough activated sludge and other nutrients to support the biology.

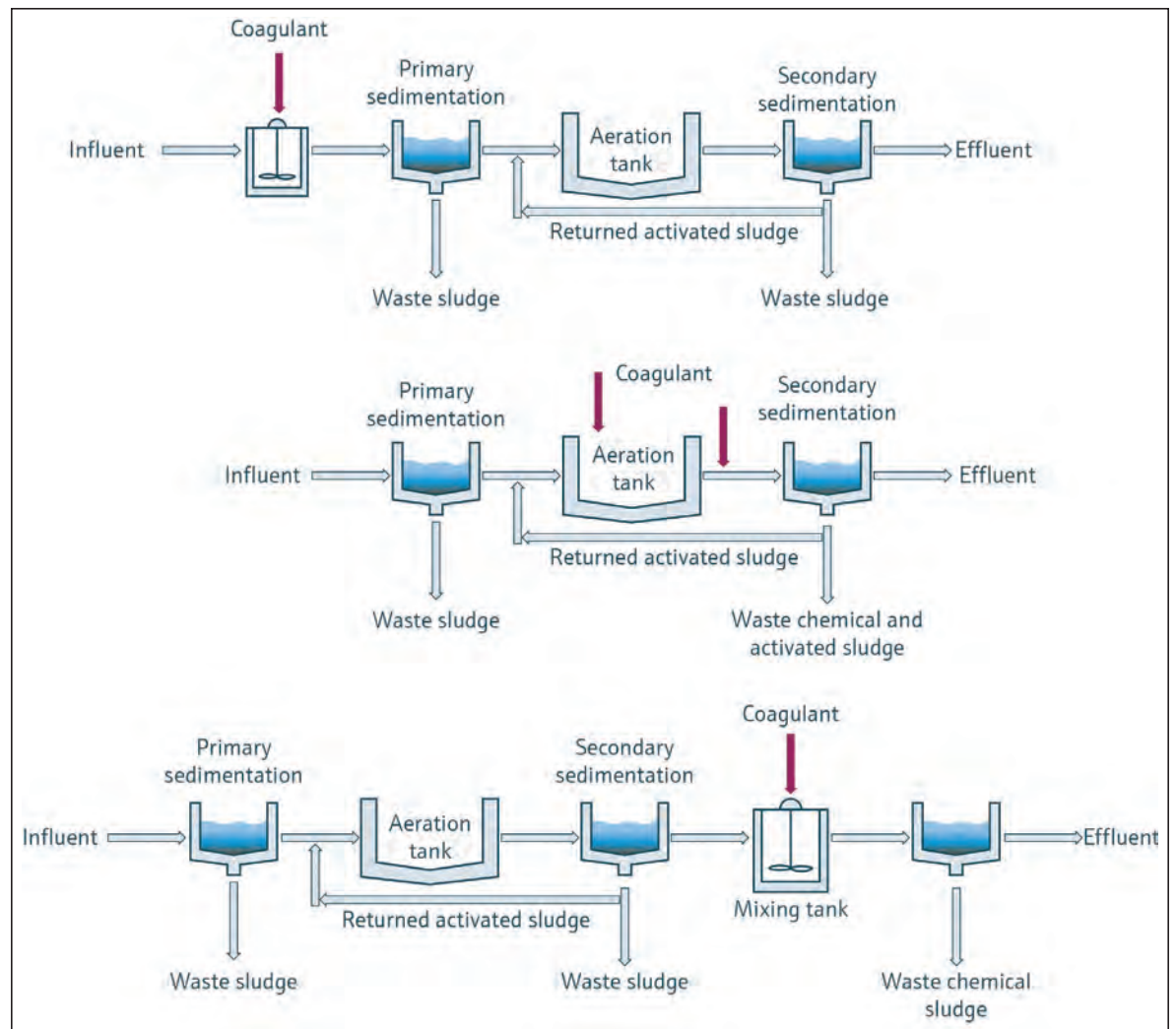
tpo: What happens at facilities that can't achieve enough removal biologically?

Doane-Weideman: They're going to do chemical addition with ferric chloride or aluminum chloride before the final clarifier, or in a side basin. Most plants take a single measurement pre-clarifier, dose the chemicals, and assume everything is fine. It's a fairly straightforward calculation. If they want to be exact — did we really get it all? — then they will measure before and after the clarifier. And then some plants will put one analyzer in the final effluent and feed it forward.

The point is that they want to save cost and still maintain the effluent quality they need. If they're just doing grab samples, they are likely over-dosing or under-dosing. If they're over-dosing they waste a lot of money because the chemicals are not cheap, and they also produce excess sludge. If they under-dose and feed the water back to aeration to re-treat, they get chemicals in the basin that can influence the performance of the biology.

tpo: How much impact can be achieved simply by using the proper instruments and with the optimum control strategies?

Doane-Weideman: The biggest savings we've quantified are with customers who are over-dosing chemicals. For example, one facility was dosing ferric chloride with simple flow pacing at a cost of \$100,000 per year. Their



The red arrows indicate some of the possible phosphorus control points in water resource recovery plants.

“The best opportunity is for plants that are not controlling for phosphorus now but are being forced to comply with a new permit limit. They have the best opportunity to start measuring and determine what they need to do next.”

TRACY DOANE-WEIDEMAN

average effluent orthophosphate was 1 mg/L, but the permit limit was 2 mg/L. By installing a dual-channel orthophosphate analyzer and implementing an advanced control strategy to operate closer to the permit limit, they reduced their chemical and sludge management costs by \$40,000 per year, while still maintaining compliance.

tpo: What kinds of plants can gain the most from online measurement and control?

Doane-Weideman: The best opportunity is for plants that are not controlling for phosphorus now but are being forced to comply with a new permit limit. They have the best opportunity to start measuring and determine what they need to do next.

tpo: How do facilities interpret the information they collect through monitoring?

Doane-Weideman: There's a lot more to it than installing analyzers.

“ Besides ensuring compliance with an NPDES permit, an optimized phosphorus strategy can provide a relatively quick return on investment.”

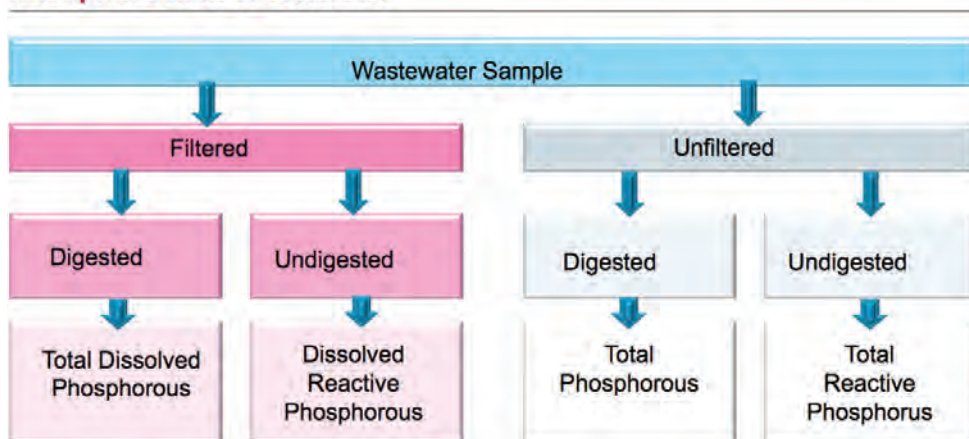
TRACY DOANE-WEIDEMAN

They're great, but they're just tools. It's about looking at the data and figuring out what they need to next, with outside help if need be. My company, for example, does plant walkthroughs to find out what measurements they have, what flows they have, what treatment they're using, what has and hasn't worked, what their problems and concerns are. Sometimes with education they can make their own decisions. Some are already very sophisticated. We can consult with them and help them, work with their engineering firm, provide project management, and be there after they put a measurement in to make sure it's optimized.

tpo: What are some qualities plant teams should look for in analyzers?

Doane-Weideman: First they need to evaluate how much maintenance the analyzer requires and whether they have the capability to maintain it. Ideally there should be no tools required on any standard item that has to be touched during maintenance. They need to evaluate the volume and cost of the reagents required. They also need to know whether the device has to be placed in a building or can sit outside next to a basin. Finally, they need to know the precision and accuracy of the analyzer itself and make

Phosphorous in Wastewater



Two possible feedback control scenarios using the PID control of the phosphate analyzer with the flow input to control precipitant dosing.

sure it meets the criteria for where they plan to place it and how they intend to use it.

tpo: Do the phosphorus analyzers tie in the SCADA systems?

Doane-Weideman: The orthophosphate can be fed to the plant control system. However, sophisticated analyzers have a PID controller built in. In that case there is no need to do the engineering into the SCADA system — just send the output to the SCADA so the operators know what they've got. Analyzers today are a lot more than chemists in a box. They can be actual control systems. **tpo**

*inspiring
stimulating
motivating*

Savored by wastewater and water treatment professionals everywhere.

Get your fill for free. Subscribe at tpomag.com

P-80[®] Emulsion Pump & Seal Lubricant

The product of choice for maintenance and repair

Ease seals, O-rings, flange gaskets and many other rubber parts into place using
P-80[®] Emulsion Temporary Rubber Lubricant.

Product Advantages:

- P-80[®] is biodegradable and non-toxic
- P-80[®] reduces the force required for assembly
- P-80[®] reduces rejects and part damage
- P-80[®] reduces slippage and musculoskeletal injury
- P-80[®] allows tight fitting part design
- P-80[®] improves product performance
- P-80[®] is temporary - once dry, the lubrication is gone



Request your FREE, no-obligation sample
 by calling (609) 386-8770 or sending an email to parts@ipcol.com



Website: www.ipcol.com Email: mkt@ipcol.com U.S. Headquarters: Phone (609) 386-8770 For sales in Europe: Phone +44(0)208-857-5678

FREE INFO – SEE ADVERTISER INDEX



Keeping it GREEN since 1979

www.colepublishing.com

CHLORINE SAFETY

KNOW EXACTLY HOW MUCH YOU FED & HOW MUCH REMAINS

INSTANTLY STOP A DANGEROUS CHLORINE LEAK!



Chlorine & Chemical Tank Scales



CHECK. CONTROL. COMPLY.

Chlorine Emergency Shutoff Systems



Your Partner in Safety

FORCE FLOW / HALOGEN Concord, CA USA +1 (925) 686-6700

FREE INFO – SEE ADVERTISER INDEX



A Step Up in Class

A NEW MEMBRANE FILTRATION PLANT CHALLENGES THE OPERATIONS STAFF BUT YIELDS HIGHER-QUALITY WATER FOR A GROWING UTAH COMMUNITY

STORY: **David Steinkraus**
PHOTOGRAPHY: **Sallie Shatz**



Jordan Hendrix, tradesman at the Ogden City Water Treatment Plant, manually operates an air-actuated valve (ASCO Numatics).

WHEN THE SUMMER HEAT ARRIVES IN NORTH-WESTERN UTAH NEAR GREAT SALT LAKE, THE CITY of Ogden calls on a modern tool to increase its water supply: a membrane filtration plant.

The plant and the team behind it have collected recognition after just two seasons in service from the Northwest Membrane Operator Association. The plant earned the 2016 Outstanding Membrane Plant Award – Large Facility, and Ruston Monson, water production supervisor, received the Operator of the Year award. In addition, Utah Construction and Design gave the plant its 2015 award for Most Outstanding Project for Water.

As the plant was built, the Ogden team incorporated advanced ideas to reduce future costs. There is definitely a future as Ogden, 40 miles north of Salt Lake City, is growing rapidly.

RESTRICTED SPACE

The new plant fits in a tight space; on one side Highway 39 and on the other side the Ogden River. On either side of the road and river are the steep walls of Ogden Canyon. Building began in winter of 2014, when demand for water was low, and continued into spring. The old 1953 vintage multimedia filtration plant kept operating during the project.

The microfiltration plant sits at the foot of Pineview Reservoir and draws from that source and also from Wheeler Creek, which empties into Ogden River just below the reservoir dam. A 36-inch pipe brings water to the plant. Water passes through the main valve and is introduced to a flat-bottom clarifier.

The European design splits the flow in half and introduces water 1 to 2 feet above the bottom of the clarifier. Liquid polymer and ferric chloride are introduced here to create floc. “As the sludge blanket builds, it acts as a filter for particles flowing in with the raw water. This takes up much less space than a traditional unit, and there are no mechanical parts — no chain drive, no paddles,” says Monson, who is also a master plumber. “It uses only gravity.”

After the clarifiers, water enters a vault, on top of which are four pumps (Flowserve) that push it through four 300-micron prefilters (Amiad), and then through the microfiltration membranes (Pall Corporation).

EXTENSIVE RECYCLING

Filtrate comes out through a 36-inch pipe, where chlorine is added for disinfection. It is then blended with water from the city’s wells. The outflow falls into a 36-inch pipe that runs down Ogden Canyon to the city.

Water used for membrane clean-in-place processes and enhanced flex maintenance operations is neutralized in a vault and pumped back to the head of the plant. Unfiltered water from the membranes also flows into the

Ogden City (Utah) Water Treatment Plant

BUILT: | 1953; expanded 2015

POPULATION SERVED: | 92,000

SERVICE AREA: | 26 square miles

EMPLOYEES: | 6

FLOWS: | 13.5 mgd design/8.5 mgd average

SOURCE WATER: | Pineview Reservoir

SYSTEM STORAGE: | 73.2 million gallons

DISTRIBUTION: | 360 miles of water mains

ANNUAL BUDGET: | \$38 million (operations)

KEY CHALLENGE: | Dealing with seasonal demand and annual shutdowns

WEBSITE: | www.ogdenwater.com

GPS COORDINATES: | Latitude: 41°12'43.21"N; longitude: 111°58'46.44"W





The Ogden City plant team includes, from left, Jay Lowder, public works director; Todd Stevens, operator; Kenton Moffett, water utility manager; Ruston Monson, water production supervisor; Chris Callahan and Bryson Church, operators; Jordan Hendrix, journeyman electrician and operator; Brett Hawks, master electrician and operator; and Matthew Haack, water conservation coordinator.



The Ogden City plant has licensed staff able to handle highly technical lab work in-house.

“It was very different from what we were used to. To start with, the terminology was different. We used to be concerned with headloss and time and turbidity. Now we’re talking about transmembrane pressure and permeability.”

RUSTON MONSON

neutralization vault. The result is a plant that reuses 99.9 percent of its processing water, as opposed to the typical 96 percent. “We don’t have a sewer up here, so it is a question of hauling the water away or reusing it,” Monson says.

Each clarifier contains a series of cones that form a low-velocity area in the fluid flow. Solids settle out in the cones, and when sensors determine that the cones are full, the plant computer opens a valve to transfer the sludge to the slurry building. The slurry is mixed to maintain a uniform density and fed through a mechanical screw press (Huber Technology). Dewatered solids are hauled to a recycling site; supernatant is returned to the head of the plant.

NEW MINDSET

Changing to microfiltration was a challenge for the staff. “It’s a more involved process in a way,” Monson says. “The process is more automated. For example, we don’t need an operator to initiate a backwash. But there are more chemicals, more components and more pumps.” The tradeoff is much higher-quality water. Turbidity with the previous system was 0.08 to perhaps 0.12 NTU. Now it’s 0.013 NTU regardless of conditions upstream of the intake.

In addition to two weeks of training by Pall, plant staff members visited membrane plants in Bozeman, Montana, and Park City and Garden City,

Ruston Monson, water production supervisor, displays the plant's 2016 Large Facility Outstanding Membrane Plant Award from the Northwest Membrane Operator Association.



Utah, to learn about the process and plant operations. "It was very different from what we were used to," says Monson. "To start with, the terminology was different. We used to be concerned with headloss and time and turbidity. Now we're talking about transmembrane pressure and permeability. It's the same essential principles, but a very different way to get the water to the same point."

The operators saw one highly positive change: The ability to go home at night and be with their families. The plant is so automated that there is no need to staff it around the clock, as was the case with the old plant during its operating season. Instead, operators go home with a laptop that lets them link to the plant SCADA software. They can also link into the security cameras. If there's a problem, the computer sends a text message alert to the operator on call.

"The new system gives us many more resources to see and adjust what's happening in the plant," Monson says. "With the previous system, as soon as an alert came in over a cellphone we were driving to the plant. Now we head for the plant only if the remote operation can't fix a problem." The proj-

GROWTH DRIVES DEMAND

The membrane filtration plant is not the only water source for Ogden, an expanding city at the foot of the Wasatch Mountains in central Utah. About 13 miles northeast, the city draws from six deep wells that supply water year-round. The city owns and maintains the wells, which are on U.S. Forest Service property.

"In most of Ogden, landscape irrigation is with potable water, so in the warmer summer months consumption goes quite high," says Ruston Monson, water production supervisor at the membrane plant. After the watering season (mid-May to mid-October), usage shuts down.

The wells add 13 mgd to the membrane plant's 13.5 mgd capacity. A 24-inch line carries well water down Ogden Canyon to the city and provides backup for membrane plant water in case of a problem with the 36-inch line from the plant to the city.

The driver for all this water production is growth. The area around Ogden is a prime location for skiing, hiking, biking, boating, and other recreation. "It's really an outdoor enthusiast community," Monson says. "There's a lot of new commercial growth as well."

Ogden, 40 miles north of Salt Lake City, is attractive to people who like the area but don't want the complications of big-city living. Ogden's population according to the 2010 census was 82,825; for 2015 the Census Bureau estimated 85,444, a 3 percent increase in five years.

The membrane plant is not at capacity, and there is room for more. The design allows for expansion to 17 mgd. Says Monson, "We're going to drill more wells also, and we're in the earliest stages of that process."

The Ogden City plant is situated along the steep walls of Ogden Canyon.





Chris Callahan performs maintenance on the microfiltration membrane rack (Pall Corporation).

ect includes a new high-speed fiber-optic data line running to the plant for connections to the SCADA system and out to the internet.

SKILLS MAKE A DIFFERENCE

The team members who keep the system running are Jay Lowder, public works director; Kenton Moffett, P.E., water utility manager; Monson; Brett Hawks, master electrician and operator; Jordan Hendrix, journeyman electrician and operator; and Todd Stevens, Bryson Church and Chris Callahan, operators.

“If you have your own licensed professionals in-house to perform the work at that high technical level, it saves a great deal of money.

We’re fortunate to have them.” **RUSTON MONSON**

“I’ve been told by the drinking water people from the state that with our source water, the way our plant is, where it’s positioned, and the piping below it, we have one of the most complex systems they’ve seen,” Monson says.

Since the membrane plant runs only seasonally, there is a challenge in starting it up and shutting it down every year. But this is also an opportunity, because it allows downtime for maintenance. “We really stand out in having some well-qualified technical tradesmen on staff,” Monson says.

In hiring, the department looked deliberately for people with trade skills. Having skilled people on hand is a great advantage. “You have to bid for every bit of electrical work, and treatment plants have so many components, plumbing and electrical, that you’re always bringing in outside contractors,” says Monson. “If you have your own licensed professionals in-house to perform that work at that high technical level, it saves a great deal of money. We’re fortunate to have them.”

There is nothing wrong with the skills of outside contractors, Monson says, but having licensed professionals on staff brings a faster response to problems: “One day a transformer started to go bad. When transformers start

to hum, they usually only get worse. This was right in the middle of construction on the membrane plant, and that transformer supplied electricity to the entire property.”

Because electricians were on staff, they could immediately diagnose the problem in the 480-volt, 90-amp transformer. The utility had its own electricians replace the transformer as soon as the building schedule allowed.

It was a similar story when a heating element in one of the clean-in-place tanks failed. Staff electricians jumped on the problem, pulled the old element out, and wired the new one in. Over the years, having licensed tradesmen on staff has saved the utility about \$150,000.

The technical skills aren’t deployed only at the membrane plant. The team members perform other jobs in the water distribution system, such as wiring pumps.

There is more to the new membrane plant: a sleek building with plenty of windows to let in natural light, and a minimalist control room with a few computer screens and a 70-inch monitor. But the real advantage is what goes on beyond the control room windows: Providing the city of Ogden with clean water to grow. **tpo**

featured products from:

Amiad USA
704/662-3133
www.amiadusa.com

ASCO Numatics
800/972-2726
www.asco.com

Flowserve Corp.
972/443-6500
www.flowserve.com

Huber Technology, Inc.
704/949-1010
www.huberforum.net
(See ad page 9)

Pall Corporation
866/475-0115
www.pall.com/water

LOCATED AT FAIR PARK • DALLAS, TX

WEQFAIR

Wastewater Equipment Fair



APRIL 4-5, 2017

DALLAS, TEXAS



Live demonstrations and operational equipment for the water and wastewater industries!



★ OUTDOOR EVENT ★
RAIN OR SHINE

FREE REGISTRATION

For Qualified Industry Professionals

TUESDAY April 4th

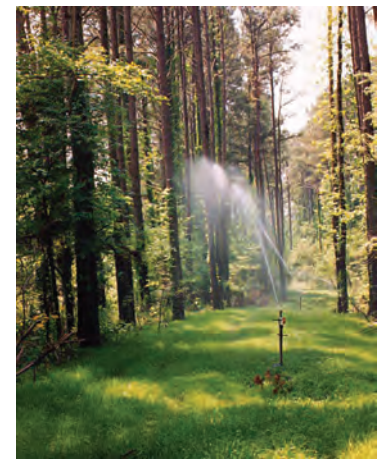
Fair Hours: 12 p.m. - 5 p.m.

WEDNESDAY April 5th

Fair Hours: 9 a.m. - 1 p.m.



Call 866-933-2653 or view complete details at: **WEQFAIR.COM**



Fabulous Forest

THE NATION'S CARPET CAPITAL IS ALSO HOME TO AN EXTENSIVE EFFLUENT LAND APPLICATION SITE THAT DOUBLES AS A HAVEN FOR BIRDS AND WILDLIFE

By Jeff Smith

At least once each year, members of the Audubon Society in northwest Georgia visit a protected forested site to conduct a bird count. Over the years, they have seen more than 170 species there.

A large population of hawks, wild turkeys, coyotes, ducks, deer and other wildlife also call the site home. The big draw is the forested habitat of the 9,800-acre land application system (LAS) maintained by Dalton Utilities.

Developed in 1984, the LAS is forested with loblolly and longleaf pine, black oak, ash, box elder, eastern swamp cottonwood, American elm, sweetgum and many other trees, along with shrubs and grasses typical of northern Georgia. Nearly 19,000 spray heads irrigate the forest with the effluent from two identical 20.8 mgd (design) activated sludge treatment plants.

EXTENSIVE OPERATION

“This is one the largest forested land application sites in the country,” says Don Johnson, director of watershed operations. “It’s nearly 13 miles from our entrance gate to the back of the property. It is a remarkable facility.”

Three pumping stations, each with two Patterson pumps, deliver effluent through ductile iron and polyethylene pipe to 76 spray fields. Impact-style spray heads are mounted on 3-foot risers, and each delivers effluent over a 60-foot diameter. Flow to the LAS is monitored by operators who take samples and continually inspect the fields for potential problems.

Johnson says the original LAS had 3-inch aluminum pipe, 10-foot risers and fixed spray heads with a reach of only 10 feet. They were replaced and upgraded during a major redesign and expansion in 1999 that has made the

facility into what it is today. To maintain the integrity of the system, trees on the LAS are selectively harvested and replanted in-house. “We do it to protect the LAS from a typical logging operation,” Johnson says.

BENEFICIAL REUSE

Dalton, known as the Carpet Capital of the World, is still home to the greatest number of floor-covering manufacturers in the nation, despite a downsizing of the industry during the economic turndown in 2008. Maxi-

“This is one the largest forested land application sites in the country. It’s nearly 13 miles from our entrance gate to the back of the property. It is a remarkable facility.”

DON JOHNSON

num influent flow from the many carpet manufacturers occurs on weekdays. To balance that flow to the LAS, a 170-acre reservoir was built to store effluent to be distributed to the LAS on weekends.

“We are a zero-discharge facility,” Johnson says. “So we are always looking for ways to extend the life of the LAS. In 2002, Dalton Utilities rebuilt its 20 mgd Riverbend Road Wastewater Treatment Plant to mirror the tech-

nology used in its existing Looper's Bend plant at the site. On that same site two years earlier, Duke Energy built four combined-cycle electric power plants to generate 1,240 MW. The facility is now owned by Oglethorpe Power.

"They can use up to 12 mgd of effluent from our two plants in their cooling towers," Johnson says. "It's one of the largest water reuse projects in Georgia and it allowed them to build a power plant without having to obtain a water withdrawal permit."

OPEN FOR HUNTING

Beneficial reuse at the treatment facilities includes a composting operation that can produce up to 100 tons each day. Biosolids are run through a centrifuge, combined with wood waste, composted for 14 days, and then placed in windrows on site for up to six months. A private firm markets and distributes the compost to landscape contractors.

Nearly 230 miles of paved and gravel roadways meander through the LAS. Public access is restricted except for tours, birdwatching, and special hunts for duck and deer. In 2001, Dalton Utilities, with the Georgia Department of Natural Resources, started a quota hunt to help control the deer population.

In 2004, turkey hunts were added, and in 2011 a youth duck hunt began. Applicants submit a 1,500-word essay about their hunting experience and desire to hunt, and are chosen at random. In 2013, in cooperation with Ducks Unlimited and Safari Club International, the event was expanded to include a Wounded Warrior Duck Hunt.

"Opening this area for controlled hunts and conducting tours for students and the community helps us illustrate what an environmentally sound operation we have at the LAS," says Lori McDaniel, utility spokesperson. "People get to walk out there and see for themselves what a beautiful pristine forest it is. That's some of the best public relations you can generate."

tpo

industry news

Frost & Sullivan recognizes Aclara with award

Frost & Sullivan has recognized Aclara with its 2016 Global Enabling Technology Leadership Award. The award was for Aclara's Grid Monitoring Platform for municipal utility analytics. The platform can be used to improve outage management, optimize operations and set maintenance scheduling.

Institute for Sustainable Infrastructure appoints John M. Stanton as president

The Institute for Sustainable Infrastructure has named John M. Stanton as president and CEO of the organization effective Jan. 3, 2017. Previously, Stanton served as the executive vice president and regulatory counsel for SolarCity in San Mateo, California, the nation's largest solar energy company.

AWWA Board of Directors selects David Rager of Cincinnati as next president-elect

The American Water Works Association selected David Rager as the association's next president-elect during its annual winter meeting. An AWWA member for almost 15 years, Rager is the principal of Rager Management Consulting. He will serve his one-year presidential term beginning in June 2018.

WE&RF welcomes new board members

The Water Environment & Reuse Foundation announced the election of two new members to its board of directors, Chris Hill of ARCADIS and Ken Lykens of HDR Engineering. The board is composed of volunteer members from municipal utilities, industry, government agencies, corporations and academia.

Endress+Hauser earns IACET accredited status

The International Association for Continuing Education and Training has awarded accreditation status to Endress+Hauser. IACET accredited providers are approved to offer continuing education units.

EnviroSuite study shows odor management saves costs

Implementing effective odor management technology can save organizations up to \$685,000 annually, according to research by EnviroSuite. The paper, *Turning Environmental Challenges into Operational Savings*, was conducted partly using odor management data collected from EnviroSuite's existing sites and partly through consultation with economists and public utilities.

UGSI Solutions acquires PAX Water Technologies

UGSI Solutions announced the acquisition of PAX Water Technologies was completed Jan. 27. PAX Water is now a wholly-owned subsidiary of UGSI Solutions, which includes: Process Solutions, UGSI Chemical Feed, and Mobile Pipe Lining and Coating. tpo

Extra! Extra!

Want More Stories?

Get extra news,
extra information,
extra features with

Online Exclusives

Exclusive online content for
Treatment Plant Operator

www.tpomag.com/online_exclusives



Like something?
Hate something?
Agree? Disagree?

Share your opinions about *TPO* articles through our Letters to the Editor.

Send a note to editor@tpomag.com

Out With RIBs?

RAPID INFILTRATION BASINS WASTE WATER THAT HAS UNDERGONE SOME LEVEL OF TREATMENT. LINED REJECT PONDS THAT STORE WATER FOR RETREATMENT ARE A SOUND ALTERNATIVE.

By Kirk Boulerice

It seems we are regularly bombarded with news about regional droughts around the country and the planet. These droughts have made the need for water conservation even more clear.

One drought that has gained particular attention over the last decade is the one that has plagued the American Southwest, and Southern California in particular. It has become necessary for some state and local governments to place water consumption restrictions on residents and businesses, and to pass laws incorporating mandatory low-flow devices on new construction and remodel projects.

Anyone who has stayed in a hotel in recent years has probably noticed the conservation cards asking guests to help reduce water consumption by reusing towels. These efforts are not without justification. Surface and groundwater levels are decreasing across the U.S. Water plants are being required to draw their water from deeper and more problematic wells, thus increasing the necessary levels of treatment and associated costs.

OUTDATED TECHNOLOGY?

Operators of wastewater treatment or reclamation facilities are typically familiar with rapid infiltration basins (RIBs). These barren plots of land are necessary in several instances. For instance, facilities that lack redundant fail-safes may need an RIB in case a piece of monitoring equipment unexpectedly fails.

At other times, toxic loads can cause microorganism upsets that degrade effluent quality to the point where it is no longer permissible to deliver the water to a reclaim system. Under these circumstances, TSS, BOD or nutrients may be at levels considered inadequate for reclaimed standards. It would therefore be necessary to divert the flow to an RIB until the effluent quality was restored to meet the reclaim standards.

Over a year, these diversions can add up to substantial percentages of wasted water at a time when water conservation is imperative for many communities. Depending on the reason for the diversion, the quality of the effluent going into the ground should also be of concern.

Improperly treated wastewater deemed unfit for reclaimed purposes is likely to contain higher levels of pathogenic bacteria and nutrients. While wastewater treatment facilities are required to maintain a certain level of treatment pursuant to their permit when diverting to an RIB, the eventual goal for the industry should be for facilities to have zero water loss and release zero pollutants. This is perhaps a lofty goal, but if we judge how far wastewater treatment has advanced in the last century, it would seem appropriate to aim for that next leap.

A SIMPLE TWIST

This is where the case for lined reject ponds or holding tanks can be made. In the most basic form, an RIB is converted to a lined reject holding pond by installing a water-impermeable liner. An attached lift station can then reintroduce the reject water to the treatment process.

From the lift station, a trunk line can go out to the plant with a network of valves and branch lines to control where in the process the reject water is introduced. The point of reintroduction will depend on the retreatment level

required to meet reclaim standards and minimize cost.

For facilities limited in space or where odors are a concern, enclosed holding tanks can be used instead of ponds. If planned with enough foresight, reject holding tanks can serve multiple purposes. Aside from acting as a diversion tank for poor-quality effluent, they can be piped to act as emergency surge tanks during storm events.



Kirk Boulerice

As with many entities whose budgets are funded by taxes, wastewater treatment facilities are increasingly expected to do more with less. Sending water that has been treated to any degree to a RIB for non-beneficial uses is a waste of resources.

FINANCIAL BENEFITS

Wastewater facilities designed and permitted to produce reclaimed water have an environmental obligation to ensure best practices at all times in their process control procedures. From a financial standpoint however, it would be in every utility's best interest to produce the maximum output based on incoming flows.

As with many entities whose budgets are funded by taxes, wastewater treatment facilities are increasingly expected to do more with less. Sending water that has been treated to any degree to an RIB for non-beneficial uses is a waste of resources.

Typically, water that has not met reclaim standards and must be directed to an RIB has already undergone primary, secondary and tertiary, and potentially disinfection as well. Each level represents a cost per gallon. It is worth noting that lining an RIB also reduces preventive maintenance costs by eliminating the vegetative growth controls typically outlined in a permit to ensure the fastest percolation.

It is in the best interest of utility leaders — and it is also their responsibility — to research and advocate for the best and most efficient treatment technologies. For wastewater treatment facilities able to produce and dispatch reclaimed water, a justifiable and fiscally wise capital improvement suggestion would be a reject water-holding system.

As communities further restrict personal water consumption and utility customers become more aware of water shortages, utility leaders are better positioned to secure financing for water conservation improvements. As has happened with trickling filters, it may be time to start phasing out RIBs as newer options prove to be more viable.

ABOUT THE AUTHOR

Kirk Boulerice is chief operator for the City of Apopka, Florida. **tpo**

FATBOY

Keep stuff cold. Keep stuff dry. Keep stuff safe.

Fatboy
20 QT Cooler
\$129



45 Quart
\$179

75 Quart
\$229



**DOUBLE DRAIN
PLUG**



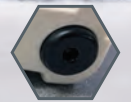
**DUAL STAINLESS
LOCKING CORNERS**



**FAST-DRAIN
BUTTON**



**ALL STAINLESS OR
ALUMINUM HARDWARE**



**FRICTION
FEET**

**Order yours at FatboyCoolers.com. Use promo code
FB2017 to save 10% on your order and get free shipping**

Fatpack
Original
\$69.95



Fatpack
Heavy-Duty
\$79.95



24 CANS + ICE



FLOATS



WATERPROOF



RUGGED



PADDED



INSULATED



REFLECTIVE

FREE INFO - SEE ADVERTISER INDEX

Process Improvement Made Simpler

LOW-COST MODIFICATIONS TO THE AERATION PROCESS AT A SMALL MASSACHUSETTS PLANT BRING SUBSTANTIAL EFFLUENT NUTRIENT REDUCTIONS AND OTHER MONEY-SAVING IMPROVEMENTS

By Ted J. Rulseh

Sometimes it doesn't take a major plant upgrade to drive down the nutrient content of effluent and improve overall plant performance.

Bob Gabry, chief operator at the Sunderland (Massachusetts) Wastewater Treatment Plant, will gladly so attest. A few inexpensive changes to the aeration process at his 0.5 mgd (design) activated sludge plant yielded consistently low effluent total nitrogen, plus elimination of filament problems, better sludge settling, reduced biosolids hauling costs, and substantial savings on chlorine.

It all resulted from a few months' work and experimentation in 2014 with Grant Weaver, P.E., president of The Water Planet Company, a wastewater treatment consulting firm.

FLYING SOLO

Gabry, employed by private contract operator Warner Brothers, runs the Sunderland plant himself except for fill-ins during vacations and weekends. The 40-year-old extended aeration plant averages 175,000 to 200,000 gpd; flow is somewhat seasonal because the community of 2,300 hosts a number of apartment-dwelling college students from the University of Massachusetts in nearby Amherst.



Bob Gabry at the aeration timer control (Eagle Signal).

Nitrogen reduction is an issue among plants in the area because of an initiative to protect Long Island Sound. The Sunderland plant's permit allows discharge of 35 pounds of total nitrogen per day to the Connecticut River.

Gabry, who has been at the plant for 30 years, had taken steps to make the process more energy-efficient by placing the mechanical aerator on a timer and operating it at intervals instead of continuously, looking to keep dissolved oxygen (DO) in the basin at 1 mg/L. Still, he faced frequent explosions of filamentous bacteria, which led to bad solids settling in the final clarifier, effluent turbidity, and sludge bulking, all of which he sought to control by chlorinating the return activated sludge (RAS) line. "It was a battle for years," Gabry says. "I was putting thousands of dollars' worth of chlorine per year into the return line."



Grant Weaver, left, president of The Water Planet Company, and Bob Gabry, chief operator at the Sunderland Wastewater Treatment Plant, at the MCC panel housing the sc200 controller (Hach).

Weaver stopped at the plant during his travels, introduced himself to Gabry, and offered to demonstrate a process change that could improve nitrogen removal and address the other issues Gabry was facing. Weaver observes, "There are two basic kinds of operators. Some want to learn how they can do the most with what they have and buy what their community needs, but really no more. Others see it as their job to invest in the latest and greatest — the most up-to-date, sophisticated equipment and technology. Bob is in that first category."

At first, Gabry was skeptical about what Weaver presented. Then he talked to operators at a few other plants who had adopted the suggestions. "They were almost doing cartwheels it was so good," he recalls.

TAKING ACTION

Weaver says, "In Bob I saw an operator who on his own initiative had the idea to turn the aeration equipment on and off to keep down filaments and save electricity. He had a good grasp of that. It showed me that he was willing to change the status quo."

“Therefore, it was easy to enter a discussion of extending the air-off time to allow the plant to go anoxic and remove the nitrate that is created when you remove ammonia. If you get rid of the nitrate, that should help the clarifier settle a little better, and it should act as somewhat of a selector for filaments. You create two environments: air-on time where the basin is more aerobic, and air-off time when it’s more anoxic. Bacteria that thrive in either condition get banged by cycling through the opposite condition. Bob’s head wrapped around that quickly.”

The process adjustments included:

- Replacing existing aeration timers with a 10-hour timer (Eagle Signal)
- Installing a Hach sc200 controller, LDO oxygen sensor and Digital ORP sensor
- Acquiring a hand-held ORP probe (YSI, a Xylem brand)

The DO probe operates in a feedback loop with the aerator to maintain the aeration basin DO at 1 mg/L at times when the blower is running.

The next step was to test-drive different blower on and off intervals. After a period of discussion and experimenting, Gabry arrived at a “sweet spot” of 3.5 hours on (for nitrification) and 1.5 hours off (for denitrification), around the clock. Along the way, he acquired equipment to perform nitrate, nitrite and ammonia testing, notably a colorimeter (Hach). Data from the DO probe is fed back to the plant control room where a seven-day chart recorder (Honeywell) tracks the DO levels and on-off cycles.

SEEING RESULTS

“It didn’t take that much time to get the process locked in,” Gabry says. “Within about a month-and-a-half I had identified the on times and off times that worked best. The plant really responded quickly. I had a grin on my face 24/7.”

Plant influent ammonia averages 40 mg/L, and effluent ammonia now averages 0.1 to 2 mg/L, versus 15-20 mg/L previously. Effluent total nitrogen averages 8 mg/L, versus 25 mg/L before the process changes. The plant used to discharge 25 and 30 pounds of nitrogen per day into the river; it now releases 8 to 12 pounds.

“It didn’t take that much time to get the process locked in. Within about a month-and-a-half I had identified the on times and off times that worked best. The plant really responded quickly. I had a grin on my face 24/7.”

BOB GABRY

curve goes higher, so the free swimmers go away. We have stalked ciliates and rotifers now, and they’re very happy.”

In addition, the process change has greatly improved sludge settling and sharply reduced the volume of biosolids hauled offsite. The plant had been sending up to 10 9,000-gallon loads per month at less than 1 percent solids. That has been reduced to three or four loads at 2 to 3 percent, saving up to \$2,000 per month. Because chlorination of the RAS line is no longer needed, chlorine usage has dropped from as much as 1,600 gallons per year to 800 gallons, saving up to \$2,000.

AVOIDING UPGRADES

Weaver says the lesson from Sunderland is that operators willing to modify their day-to-day operations can significantly reduce effluent nitrogen in

In addition, the filament issues cleared up quickly. “My sludge volume index (SVI) levels before were in the upper 200s to 400s, and sometimes even 500 or 600,” says Gabry. “So you can imagine the stress on the clarifier. Within a couple of months after starting the new process, my SVIs were going down, down, down. The effluent was getting cleaner, and the filaments went away. SVIs have gone down to under 100.

“The stability under the microscope is phenomenal. I can look at it today and look at it in a week and it hasn’t changed a bit. I’m running a higher mixed liquor suspended solids (MLSS) — about 3,500 mg/L versus 1,500 mg/L before. The growth

Hit your target with the Sludge Gun®

portable
sludge level detector



Spot-Check

- sludge, silt & biosolids levels
- in clarifiers, tanks & lagoons

Helps you

- Eliminate unnecessary pumping/dredging
- Prevent carryover
- Monitor bed depth for regulatory compliance
- Provide valuable sludge blanket profiles

Contact Markland today.

Call **905-873-7791** • **1-855-873-7791** in NA
markland@sludgecontrols.com

MARKLAND
Specialty Engineering Ltd.

*A half century of service
to the water & wastewater industry*
www.sludgecontrols.com

FREE INFO – SEE ADVERTISER INDEX

most facilities, in some cases replacing plant upgrades that could cost in the millions of dollars.

“It does take more operator attention,” he observes. “Bob now spends time checking things he didn’t used to check. My role is to help operators move from one comfort zone to a new comfort zone. Every person is different.”

Says Gabry, “If we had not done this, we would be building tanks, adding anoxic zones, putting in selectors. It would be hundreds of thousands of dollars.” **tpo**

Share Your Ideas

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

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

Monitoring and Instrumentation

By Craig Mandli

Analytical Instrumentation

BURKERT FLUID CONTROL SYSTEMS TYPE 8905 ONLINE ANALYSIS SYSTEM

The Type 8905 Online Analysis System from Burkert Fluid Control Systems is a modular system for monitoring all important water parameters on one platform. It is a multichannel, multifunction unit for sensor cubes and electronic modules from the EDIP platform. The efficient device integration platform allows high flexibility by using modularity in the hardware as well as in the software of the system. It allows for continuous measurement of high-priority water parameters such as pH value, chlorine, conductivity, ORP value and turbidity. Modularity in hardware and software offers high flexibility for easy installation, use and operation. It functions from a library or user-defined algorithms, and has interaction with actors and actuators in the treatment process via analog or binary (semiconductor switches and relay) inputs and outputs to control functions like open and/or closed loop control. **949/223-3100; www.burkert-usa.com**



Type 8905 Online Analysis System from Burkert Fluid Control Systems



HydroACT chlorine analyzer from Chemtrac

CHEMTRAC HYDROACT

The online HydroACT chlorine analyzer from Chemtrac is versatile and user friendly. Using a membrane-covered three-electrode amperometric sensor, the pH dependency is significantly reduced. Free and/or total chlorine measurement sensors can be used for various ranges of chlorine measurement (0-2, 0-5, 0-10 ppm, etc.), and there is no need for zero calibration. Since the analyzer does not require any reagents or buffers, the cost of ownership is low. The data is suitable for reporting when used in compliance with EPA Method 334.0. When incorporating additional sensors, the analyzer can also be used for measuring more parameters, including pH, ORP, chlorine dioxide, ozone and organics. Expandable output and communication options are available, as well as PID control capabilities. **800/442-8722; www.chemtrac.com**

Controllers

ADEGE WATER TECHNOLOGIES INGENIUS

InGenius control panels from AdEdge Water Technologies are custom-engineered programmable logic control panels designed to meet site specifications for monitoring and integrating treatment systems with aux-



InGenius control panels from AdEdge Water Technologies

iliary equipment and controls for water systems. The panels integrate the process in one place for safety, monitoring, ease of service and installation. They are NEMA 1-4, 4X, 12, 13 certified, and constructed from thermoplastic, stainless steel, painted steel and fiberglass. They have a hand on/off selector, backwash indicator, LED lamps, security key latch and probe-mounted displays for flow, pH, chlorine, TDS and turbidity. They include level and relay controls, auxiliary power supplies, power converter (110- to 24-volt or 12-volt and AC to DC), surge protection, Ethernet networking, audible/visual alarm indicators and a SCADA interface. **866/823-3343; www.adedgetech.com**

DSI DYNAMATIC EC-2000

The EC-2000 digital universal controller from DSI Dynamatic is suitable for any brand of eddy current drive. It has the option of being equipped for Ethernet IP communication, simplifying the installation and setup of the controller, and permitting all control communication to be transmitted over a single pair of wires. Compatible devices and protocols include those by Allen Bradley, Omron, Beckhoff and Modbus/TCP. With this added connectivity, they can be controlled remotely via an internet connection, displaying a replica of the digital keypad on a PC, tablet or smartphone. Alarm signals can be sent via email or text. It also communicates via relay commands and analog 4-20mA signals. It includes serial communication capability via various standards. **800/548-2169; www.dynamatic.com**



EC-2000 digital universal controller from DSI Dynamatic



MultiSmart pump station manager from Flygt - a Xylem Brand

FLYGT - A XYLEM BRAND MULTISMART

The MultiSmart pump station manager from Flygt - a Xylem Brand combines PLCs, RTUs and pump controllers in a comprehensive package. The pump station manager integrates numerous control panel components. It includes preprogrammed logic specifically designed to significantly reduce operating costs. It includes an easy-to-configure setup wizard for commissioning a new station. It has built-in local SCADA. Remote control programming reduces maintenance cost and frequency of site visits. **855/995-4261; www.xylem.com**

GREYLINE INSTRUMENTS PSL 5.0

The PSL 5.0 pump station level controller from Greyline Instruments has redundant level sensing. It includes a noncontacting ultrasonic sensor and can be connected to a loop-powered pressure sensor for redundant sensing in applications with foam or grease. It will continuously recalibrate the pressure sensor and automatically switch back and forth from ultrasonic to the pressure sensor as required. It is designed for lift stations, wet wells and storage tanks. Calibration and relay setpoints are easy to enter through the user-friendly keypad and menu system. An automatic pump runtime logging and reporting system helps operators to plan pump maintenance and identify lazy pumps before they fail. It includes an isolated 4-20mA output and six programmable control relays for pump control, pump alternation and level alarms. An intrinsically safe sensor and a built-in data logger are optional. **315/788-9500; www.greyline.com**



PSL 5.0 pump station level controller from Greyline Instruments

PRIMEX PSLT



PSLT transmitter from PRIMEX

The PRIMEX PSLT provides a reliable and low-maintenance solution for level control applications. The instrument measures the hydrostatic pressure of the water above the sensor and outputs a 4-20mA signal proportional to the level. The transmitter-wetted components are designed to provide an electrical isolation barrier while the protective diaphragm isolates the pressure sensor from process material. It has an industry-standard 4-20mA, is two-wire-loop powered, with an 18/2 shielded cable with vent tube, removable lock-in-place stabilizing weight, and has multiple ranges and cable lengths available. **844/477-4639; www.primexcontrols.com**

PROMINENT FLUID CONTROLS CHLORINE ANALYZER AND CONTROLLER

Chlorine Analyzers and Controllers from ProMinent Fluid Controls provide precise monitoring or control of chlorine for potable and wastewater applications. They use amperometric sensor technology resulting in a reagent-free online analysis with no colorimetric concerns or reagents. Packages are fully plumbed, wired and assembled on a back panel for easy wall mounting. Choose one of three packages by selecting one part number that includes a microprocessor analyzer, flow cell, flow sensor and a (2 or 10 ppm) free or total chlorine sensor. They have a reagent-free sensor design, are EPA Method 334.0 compliant and no service contract is required. **412/787-2484; www.prominent.us**



Chlorine Analyzers and Controllers from ProMinent Fluid Controls

SEE WATER WS SERIES

Intrinsically safe WS Series pump control panels from See Water are designed for dewatering applications in hazardous locations. The pump panels provide intrinsically safe circuit extensions for one or two pumps for sewage pump chambers, grinder pumps, sump pump basins and lift stations. They come standard with clear-front NEMA-4X polycarbonate enclosures, alarm visual indicators, and are UL 698 approved. All systems are UL listed



WS Series pump control panels from See Water

for the U.S. and Canada. **888/733-9283; www.seewaterinc.com**

SINGER VALVE MCP-TP SERIES

The MCP-TP Series from Singer Valve is a multiple-process loop control panel designed to complement the 2SC-PCO dual solenoid control valve. It is custom designed to meet a range of applications dependent on the feedback transmitters used, which is similar to (but not limited to) combination automatic control valve functions with conventional pilots. It can monitor multiple processes and remotely control the dual solenoid control valve based on system conditions. It can function as a simple single-loop controller for pressure reducing, flow control and level control. It reads transmitted signals and energizes the dual solenoid pilots on the control valve. It can react to any change in conditions by monitoring the system continuously and comparing actual process values to desired setpoint values. Optional alarm outputs for SCADA are available. **888/764-7858; www.singervalve.com**



MCP-TP Series control panel from Singer Valve

Data Loggers

MATCHPOINT WATER ASSET MANAGEMENT PRIMAYER LTD. XILOG+



Primayer Ltd. XiLog+, distributed by Matchpoint Water Asset Management

The Primayer Ltd. XiLog+, distributed by Matchpoint Water Asset Management, is an advanced data logger with 3G, GPRS and SMS communications for potable and wastewater applications. It can be used for remote pressure logging and flow monitoring on large commercial meters, as well as for district-metered areas. The recorded data is transmitted daily to the cloud-based viewing software, PrimeWeb, which allows for remote data analysis and the ability to observe changes in network conditions, water usage and nightlines. Immediate leak alarms enable rapid leak detection. The unit's battery power has a life span of up to five years. **910/509-7225; www.matchpointinc.us**

Flow Control and Software

ALLMAX SOFTWARE OPERATOR10

Operator10 from AllMax Software provides a central database for all of a plant's operational and process control data. Users have the ability to manually enter data, pull data directly from SCADA and/or import data from LIMS programs. The built-in tools allow for regulatory reporting/electronic submittal, custom report creation, graphing, process control calculations, built-in formulas (MCRT, SVI, F/M Ratio, etc.), easy customizable data entry sheets, customizable user dashboards, a full audit trail, and a biosolids module. Users benefit from easy access to historical/current plant data, decreased time on monthly reporting, better overall data management and improved plant efficiency. **800/670-1867; www.allmaxsoftware.com**



Operator10 from AllMax Software

ANUE WATER TECHNOLOGIES FLO SPEC CONTROL SOFTWARE

Flo Spec Control Software from Anue Water Technologies is a fully SCADA-compliant program that allows for bidirectional monitoring and control of each system with access to Wi-Fi or Satellite/Local CAT 5 internet connectivity. It is manufactured in a NEMA 4 cabinet, and is standard with all three basic platforms, including Phantom I and II for point source odor control, FORSe 2 oxygen generation systems for force main corrosion control, and FORSe 5 Combination ozone and oxygen systems for larger odor and corrosion control applications. The efficiency of immediate data access and system control has allowed municipalities and industrial wastewater operations to reduce costs. The design allows stand-alone remote system monitoring as well as SCADA interface as a standard product offering. Options include specific alarm alerts that can be sent to any computer or smartphone to identify and correct problems quickly. **760/727-2683; www.anuewater.com**



Flo Spec Control Software from Anue Water Technologies

(continued)

Gas/Odor/Leak Detection Equipment

ANALYTICAL TECHNOLOGY C-21 DRI-GAS SAMPLING SYSTEM

The C-21 DRI-GAS Sampling System from Analytical Technology can be used to monitor combustible and toxic gases in areas where there are condensing levels of moisture that often result in premature sensor failure. The system draws gas samples from high humidity vent stacks, ducts, wet wells or other humid locations. It removes water vapor from the gas sample by contact with a cold plate that condenses moisture and delivers a dehumidified gas sample suitable for toxic and combustible gas monitoring equipment. **800/959-0299; www.analyticaltechnology.com**



C-21 DRI-GAS Sampling System from Analytical Technology



Jerome J605 hydrogen sulfide monitor from Arizona Instrument

ARIZONA INSTRUMENT JEROME J605

The Jerome J605 low-level portable hydrogen sulfide monitor from Arizona Instrument is designed to detect at concentrations as low as 3 ppb with a resolution of 20 ppt. It has a survey mode that allows the user to continuously draw in samples of air in order to sweep an area for hydrogen

sulfide hotspots or leaks and enable corrective action to be taken. Its wide detection range makes it useful for multiple applications, including regulatory compliance and odor control at wastewater and landfill facilities, scrubber efficiency testing and monitoring corrosion in control rooms. **800/528-7411; www.azic.com**

FORCE FLOW CHLOR-SCALE AND HALOGEN ECLIPSE

To protect chlorination systems from dangerous leaks, the Halogen Eclipse emergency valve shut-off system instantly closes the container valve when a signal is received from a leak detector, panic button or from SCADA. The actuator quickly installs on the tank without the use of any tools and allows manual operation of the valve while in place. During an emergency shutdown event, the system measures the actual torque applied to the valve to ensure the valve is closed to Chlorine Institute recommended standards and provides remote confirmation that the emergency close operation successfully closed the valve. The Chlor-Scale from Force Flow safely cradles a chlorine ton container while providing critical feed and chemical inventory information. Know in real time exactly how much chlorine has been fed and how much remains in the tank. It can warn of excessive or insufficient feed rates and can be remotely monitored from a PLC or SCADA system. **925/686-6700; www.forceflow.com**



Chlor-Scale and Halogen Eclipse from Force Flow

Gauges

ENDRESS+HAUSER FMR10 AND FMR20

Endress+Hauser's FMR10 and FMR20 free-space radar level transmitters measure liquid levels in storage tanks, open basins, open channels, weirs and canal systems. The FMR10 measures up to 16 feet with

0.2-inch accuracy, while the FMR20 measures up to 66 feet with 0.08-inch accuracy. The FMR10 has a 4-20mA output and is Bluetooth-enabled. The SmartBlue app provides secure communication with the transmitter to configure or view envelope curves. The FMR20 has a 4-20mA HART smart output for optional remote configuration. Hermetically sealed wiring and fully potted electronics eliminate water ingress in harsh environments. **888/363-7377; www.us.endress.com**



Endress+Hauser's FMR10 and FMR20 level transmitters

KELLER AMERICA LEVELRAT

The LevelRat from Keller America proves that wastewater level transmitters don't need to be bulky, nonstick diaphragms don't need to be large and fragile, lead times can be short, and transmitters can be protected from lightning. It offers 0.5 percent FS TEB accuracy and dual outputs — analog and RS485 digital. Models equipped with a 4-20mA analog output include lightning protection carrying a lifetime guarantee against damage from electrical surge. **877/253-5537; www.kelleramerica.com**



LevelRat transmitter from Keller America

MARKLAND SPECIALTY ENGINEERING SLUDGE GUN

The Sludge Gun from Markland Specialty Engineering measures silt/biosolids interface levels in clarifiers, tanks and lagoons, and helps provide valuable level profiles. This hand-held detector allows users to monitor biosolids bed depth for regulatory compliance and prevention of carryover, and to eliminate unnecessary pumping/dredging. It uses high-intensity infrared light to detect densities ranging from light flocs to thick blankets. As the sensor is lowered into the tank/pond, the instrument emits an audible tone, which varies in volume and pitch depending upon the concentration of suspended solids. The blanket and overlying cloudy layer are located by observing depth markers on the cable. The high-power Model 10-HP excels at finding the level in murky lagoons, while the Model 10-LP detects clear liquid surfaces. It is compact, weatherproof and convenient for boats or catwalks, with no calibration necessary. **855/873-7791; www.sludgecontrols.com**



Sludge Gun from Markland Specialty Engineering

PMC ENGINEERING MTM3000 SERIES

The MTM3000 Series submersible transmitter from PMC Engineering is designed for depth and level measurements of groundwater, wastewater and seawater where space is limited. Pressure ranges from 0-10 to 0-500 psi. Operating temperature is 25 to 125 degrees F. The .39-inch titanium housing offers high performance in very small, i.e. 1/2-inch monitoring wells, stand pipes and bore holes. Highly developed piezoresistive sensing technology provides high accuracy of 0.1 percent and long-term stability of better than 0.1 percent per year. It provides a very high overpressure of at least three times the rated range without any degradation of the sensor performance. When used with the MP11 moisture protection option, the user can expect maintenance-free operation for an extended period of time, typically more than 10 years. **203/792-8686; www.pmc1.com**



MTM3000 Series transmitter from PMC Engineering

Meters

BLUE-WHITE INDUSTRIES SONIC-PRO

Sonic-Pro hybrid ultrasonic flowmeters from Blue-White Industries measure flow rate using either Doppler or Transit Time methods. Noninvasive clamp-on transducers work with both clean and dirty fluids, with a high-capacity flow velocity range of up to 30 feet per second. Because the meter does not come in contact with the fluid being measured, the meter is suited for use in applications where harsh chemicals and other abrasive fluids are being used. It can be configured and controlled remotely via RS-232, RS-485, USB or Ethernet. View real-time flow and download data log files remotely on a Windows PC. It has an easy-reading backlit LCD, and data is logged to a standard SD card supplied with unit. It has isolated a 4-20mA output that is fully configurable and a 0 - 1000 Hz pulse output that is fully configurable. **714/893-8529; www.blue-white.com**



Sonic-Pro flowmeters from Blue-White Industries

POLYLOK 3014AB FILTER ALARM (SMART ALARM)

The 3014AB Filter Alarm (Smart Alarm) from Polylok is a wired indoor/outdoor filter alarm that provides audio/visual warning for home or business owners that their tank filter needs cleaning. The Smart Alarm Switch activates when the filter cartridge is near capacity (approximately 90 percent full) on solids that have built up through the filtering process. The Smart Alarm Switch, which is installed in the filter, sends a signal to the alarm panel activating the audible and visual alarm, alerting the home or business owner that the filter needs servicing. It offers manual alarm test switch and horn silence, an alarm horn rated to 82 decibels at 10 feet and 15 feet of cable with longer lengths available. **877/959-7751; www.polylok.com**



3014AB Filter Alarm (Smart Alarm) from Polylok

Process Control Equipment

HACH MOBILE SENSOR MANAGEMENT



Mobile Sensor Management from Hach

Mobile Sensor Management from Hach provides clarity through easy access to crucial information, helping manage processes and be proactive in maintenance. It guides the user through actionable sensor information, helps to align process and laboratory measurements, and provides simple maintenance instructions via smartphone. Web-based software provides access to the enrolled Hach analytical

instrumentation through any internet-enabled device with a standard browser. All access to the server is controlled by secure authentication. The status information provided gives an overview of the performance of each individual analytical instrument, and provides specific information about upcoming maintenance activities for each instrument. Maintenance procedures can be started easily from the dashboard of the software. Interactive and step-by-step guidance through the various maintenance steps allows for quick and accurate execution. **800/227-4224; www.hach.com** *(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

People.

The greatest natural resource.

tpomag.com
SUBSCRIBE FOR FREE



Convert Your Mobile Device into a HART Communicator ... with our Advanced HART-based Products

Get HART® Data...On the Go!

CONNECT → CONFIGURE → DOCUMENT

DevComDroid Communicator App
Full DD access to HART instruments using your Android device

DevCom2000 Communicator Software
Full DD access to HART instruments using your Windows device

HART Modems (Interface Hardware)
Bluetooth, USB and RS232 models





Process Communications Solutions
www.procomsol.com

Call Us: 216.221.1550
or toll free: 877.221.1551
Fax: 216.221.1554
Email: sales@procomsol.com



FREE INFO – SEE ADVERTISER INDEX

HOFFMAN & LAMSON, GARDNER DENVER PRODUCTS RIGEL CONTROLS

Rigel Controls from Hoffman & Lamson, Gardner Denver Products effectively control blower speed to meet process demands while providing adequate blower protection. The energy savings as a result typically exceed expectations. Most systems continue to provide a minimum of 20 percent energy savings on average when compared to inlet throttling, and allow the operators to have additional range of operation of the equipment. **724/239-1500; www.hoffmanandlamson.com**



Rigel Controls from Hoffman & Lamson, Gardner Denver Products

SCADA Systems



Sentinel PRO system from Sensaphone

SENSAPHONE SENTINEL PRO

The Sentinel PRO cloud-based system from Sensaphone provides remote monitoring of equipment and environmental conditions in water and wastewater applications. The system monitors, delivers alarms and datalogs input/output points from third-party Modbus sensors, transducers and programmable logic controllers. It supports Modbus RTU/485 and Modbus TCP. Only

one unit is required to monitor up to 64 Modbus registers and 12 different digital or analog status conditions including pump status, tank level, flow rate, pressure, temperature, humidity, water leaks and power failure. The system sends alerts via phone, email or text. Users can view data values in real time via sensaphone.net or an iPhone/Android app. All sensor readings are saved in the cloud, which protects against data loss and provides unlimited information storage. The standard system is Ethernet based, but is also available with a cellular option. **877/373-2700; www.sensaphone.com**

Sensors

CIRCUIT INSIGHTS LOOP SLOOTH EXCITER/DETECTOR

The Loop Slooth Exciter/Detector ground loop diagnostic device from Circuit Insights enables rapid, easy ground loop troubleshooting by revealing ground loop paths without disconnecting cables. The Exciter induces a test signal into the ground loop just like a real noise or interference signal would inductively couple to the ground loop. The Detector then tracks the magnetic field produced by the test signal and so traces out the ground loop physical path. The unit can also detect ground loop branching, a problem essentially undetectable by the traditional method of disconnecting and reconnecting cables. **626/201-0488; www.loopslooth.com tpo**



Loop Slooth Exciter/Detector ground loop diagnostic device from Circuit Insights

FREE INFO ON THESE PRODUCTS — RETURN FOLLOWING FORM

For FREE information on these monitoring and instrumentation products, check the box(es) below:

Analytical Instrumentation

- Burkert Fluid Control Systems Type 8905 Online Analysis System
- Chemtrac HydroACT chlorine analyzer

Controllers

- AdEdge Water Technologies InGenius control panels
- DSI Dynamic EC-2000 digital universal controller
- Flygt - a Xylem Brand, MultiSmart pump station manager
- Greyline Instruments PSL 5.0 pump station level controller
- PRIMEX PSLT transmitter
- ProMinent Fluid Controls Chlorine Analyzers and Controllers
- See Water WS Series pump control panels
- Singer Valve MCP-TP Series control panel

Data Loggers

- Matchpoint Water Asset Management Primayer Ltd. XiLog+

Flow Control and Software

- AllMax Software Operator10
- Anue Water Technologies Flo Spec Control Software

Gas/Odor/Leak Detection Equipment

- Analytical Technology C-21 DRI-GAS Sampling System
- Arizona Instrument Jerome J605 hydrogen sulfide monitor
- Force Flow Chlor-Scale and Halogen Eclipse

Gauges

- Endress+Hauser FMR10 and FMR20 level transmitters
- Keller America LevelRat transmitter
- Markland Specialty Engineering Sludge Gun
- PMC Engineering MTM3000 Series transmitter

Meters

- Blue-White Industries Sonic-Pro flowmeters
- Polylok 3014AB Filter Alarm (Smart Alarm)

Process Control Equipment

- Hach Mobile Sensor Management

- Hoffman & Lamson, Gardner Denver Products Rigel Controls

SCADA Systems

- Sensaphone Sentinel PRO system

Sensors

- Circuit Insights Loop Slooth Exciter/Detector

FREE subscription to TPO magazine

PRINT NAME: _____ TITLE: _____

FACILITY NAME: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

PHONE: _____ CELL PHONE: _____

FAX: _____ EMAIL: _____

Scan and email to: nicole.labeau@colepublishing.com / Fax to: 715-546-3786
Mail to: COLE Publishing Inc., P.O. Box 220, Three Lakes WI 54562

00417

By Craig Mandli

Mini-analyzers monitor sulfite and chlorine levels

Problem

The wastewater plants in Clarkson and Guelph, Ontario, use chlorine disinfection but have severe chlorine residual limits because the receiving stream has sensitive aquatic life. The usual approach is to feed sulfite to dechlorinate the effluent, but sulfite is an oxygen scavenger, and large residuals can result in reduced dissolved oxygen in the stream, replacing one problem with another.

Solution

Two **ChemScan mini-analyzers** from **ASA Analytics** monitor sulfite/chlorine levels and address the feed control issue. A mini LowChlor chlorine analyzer with a detection limit of 0.005 mg/L monitors the chlorine residual before or after sulfite feed, and a mini sulfite analyzer with a detection limit of 0.01 mg/L monitors the sulfite residual. The combination provides a suite of analysis that allows both chlorine and sulfite to be minimized in the effluent.



RESULT

The plants have performed extensive pilot testing of the system, documenting success in replacing ORP-based control. **262/717-9500; www.asaanalytics.com**

Continuous online monitoring system helps facility solve staffing issue

Problem

In South Charleston, Ohio, the water resource recovery facility is staffed by a part-time contract operator. To keep up with new permit requirements, the village faced a doubling of staff hours.

Solution

Instead of increasing the number of staff hours, the operator installed a continuous monitoring system: the **IQ SensorNet System** from **YSI, a Xylem brand**, online sensor network for continuous monitoring and process control. Measured values are output to a third-party cellular telemetry unit that allows real-time measurements to be viewed online. Alarms programmed into the telemetry unit notify the operator of potential problems.



RESULT

“The purpose for the installation was to maintain the same amount of hours required for the plant operator to be on site,” says Steve Canter, project consultant. “The YSI IQ SensorNet System provides continuous monitoring of effluent DO, pH and turbidity in addition to influent and effluent flow monitoring that can be remotely monitored to activate predefined alarm and relay setpoints.” **800/765-4974; www.ysi.com**

FEATURED case study

ODOR CONTROL

Tank covers address WWTP odor concerns

The **grit tank covers** that **Geomembrane Technologies Inc.** provided at the Georgetown Wastewater Treatment Plant have successfully minimized odors.

When houses were developed within a few hundred feet of the plant's property line, it wasn't long before new residents complained about odors. Plant management made a public commitment to address the problem, and focused on its grit tanks. “We were convinced capturing and treating odors was the way to go,” says Wendy Derjugin, plant operations supervisor at the plant.



GTI was selected to custom-design and install structurally supported covers for the grit tanks.

The covers easily retract, meeting the plant's access requirements. Captured foul air is then withdrawn and treated in a carbon system. “Covering the grit tanks was one of the most effective things we could do to further reduce the potential for odors,” says Derjugin.

Read the full story at www.gticovers.com or call 855/484-4630

It's your
magazine.

Tell your story.



TREATMENT PLANT OPERATOR
tpo

We'd like to hear about your water or wastewater treatment operation.
Send your ideas for future articles to editor@tpomag.com



1



2



3

1. ENDRESS+HAUSER SMART FLOWMETERS

Endress+Hauser has released Proline 300/500, a family of industry optimized “smart” Coriolis mass and electromagnetic flow instruments that simplify installation, speed commissioning, and streamline both operation and maintenance activities. Proline Promass Coriolis mass flowmeters are available in 11 models ranging in sizes from 1/24 to 14 inches in diameter, for measuring flows up to 100,000 tons per day. Proline Promag flowmeters are available in three models in sizes from 1/12 to 78 inches for volume flows up to 634 mgd. Both types are available in models suitable for high temperatures, corrosive fluids, hygienic and sterile process applications. **888/363-7377; www.us.endress.com**

2. AERZEN USA INTEGRATED CONTROLS FOR BLOWERS

The AERprocess Dissolved Oxygen Control from Aerzen USA can help control the dissolved oxygen (DO) concentration in the activated sludge process and the blowers used to generate the process airflow requirement. The system is able to maintain DO concentrations at their setpoints by combining blower and process control based on an activated sludge aeration model using plant-specific model equations. It determines the oxygen requirements in real time and calculates the total airflow required as well as the exact airflow required in each aeration zone to maintain the DO at the setpoint. **610/380-0244; www.aerzen.com/en-us**

3. AQUA-AEROBIC AQUAPRIME CLOTH MEDIA FILTRATION SYSTEM

The AquaPrime cloth media filtration system from Aqua-Aerobic Systems utilizes a disc configuration with three zones of solids removal to effectively filter high-solids waste streams without the use of chemicals. Other benefits include reduced energy costs in the secondary process, improved gas production in the anaerobic digestion system due to

reduction in organics as measured by BOD₅ and COD values. The AquaPrime system is designed to handle a wide range of flows in a fraction of space and produces consistent, high-quality effluent under varying influent conditions. **800/940-5008; www.aquaprimefiltration.com**

tpo

For FREE information on these products, check the box(es) below:

- 1. Endress+Hauser Proline 300/500 flowmeters
- 2. Aerzen USA AERprocess Dissolved Oxygen Control
- 3. Aqua-Aerobic Systems AquaPrime cloth media filtration system
- Electro-Chemical Devices X80 universal transmitter and S88 intelligent sensors
- Nidec Motor Corporation U.S. MOTORS-brand SINEWAVE OPTIMIZED motors

FREE subscription to TPO magazine

PRINT NAME: _____ TITLE: _____

FACILITY NAME: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

PHONE: _____ CELL PHONE: _____

FAX: _____ EMAIL: _____

Scan and email to: nicole.labeau@colepublishing.com

00417

Fax to: 715-546-3786

Mail to: COLE Publishing Inc., P.O. Box 220, Three Lakes WI 54562

FREE INFO ON THESE PRODUCTS – RETURN FORM ABOVE



“Treating and distributing drinking water is a significant **responsibility** that takes dedication, training and skill. Our operators welcome the challenges our plant expansion will bring, and I know they’ll continue to excel.”

Melissa Kahoun, Aqua Illinois, Area Manager, Kankakee and Will Counties
Joseph Donovan Regional Water Treatment Plant, Kankakee, Ill.

Read what **matters** to operators in every issue of **TPO**.
SUBSCRIBE FOR **FREE** AT **TPOMAG.COM**

wastewater: product spotlight

Universal analyzer designer for hazardous areas

By Craig Mandli

Every wastewater treatment plant contains hazardous areas where explosive or combustible gases could potentially be present. That's why the **X80 universal transmitter** and **S88 intelligent sensors** from **Electro-Chemical Devices** are housed in a sealed barrier made with heavy-duty construction materials for the reliable measurement of pH, ORP, DO, turbidity, conductivity or resistivity and 13 specific ions. The X80 is



X80 universal transmitter and S88 intelligent sensors from Electro-Chemical Devices

the next generation of the company's long-popular T28 transmitter.

"This unit takes the same feature set as the T28, and encloses it in an explosion-proof housing and uses optional digital communication technology," says Robert Wek, president of Electro-Chemical Devices. "That makes it a better fit for applications such as wastewater treatment where you'd see it deployed in hazardous areas."

The X80 is available as either a single- or dual-channel instrument for continuous measurement with standard MODBUS or optional HART digital communication and three optional alarm relays. It communicates with any Model S88 intelligent sensor, automatically configuring the transmitter's menus and display screens to the desired measurement parameter.

"It was designed with ease-of-use in mind," says Wek. "The menus are very easy to use and navigate."

With its rugged 316 stainless steel housing and large easy-to-read sealed display, the X80 with S88 sensors eliminates the need to inventory multiple instruments. The sensors facilitate two-way communication with the transmitter and automatically convert it to the chosen parameter. Sensors are pre-calibrated at the factory, so they're ready to use right out of the box and can be immediately connected to the X80. The sensors are waterproof and submersible with all internal components epoxy encapsulated. They are available as either insertion/submersion or valve retractable with flared end to prevent blowout.

"They also come in a replaceable cartridge, which means that when fouling happens, you are replacing the cartridge and not the whole sensor, saving time and money," says Wek.

The X80 is designed with a 2.75- by 1.5-inch easily viewable LCD display with three easily switchable main display screens for data, millivolt and graphics. The display comes with a gray background and black lettering for loop-powered instruments or with a blue background and white lettering with LED backlighting on 24-volt instruments. The unit was launched in late 2016, and according to Wek the feedback has been positive.

"We have several of these units in the field internationally, and the response has been great," he says. "We feel it's a great option for wastewater treatment applications." 800/729-1333; www.ecdi.com

water: product spotlight

A constant-speed pumping solution

By Craig Mandli

Nidec Motor Corporation has released their new line of **U.S. MOTORS-brand SINEWAVE OPTIMIZED motors** for constant-speed pumping applications. The vertical hollow-shaft motors are certified NEMA Premium efficient, making them a fit for treatment plants that struggle to meet Department of Energy (DOE) regulations.

"Due to DOE regulation changes, motors that were installed just a few years ago may have been standard efficient," explains Ed Koepke, marketing manager for Nidec Motor Corporation. "Today all motors must meet the premium efficiency levels."

In addition to meeting the new DOE efficiency requirements, SINEWAVE OPTIMIZED premium-efficiency vertical high-thrust motors are available from stock in sizes from 7 1/2 to 600 hp, and provide a lower cost alternative to inverter-duty motors. According to Koepke, they are a potential fit across several applications in the water and wastewater industry.

"These motors are typically used on any pumping within the water/wastewater facility," he says. "However, with a modified shaft, they are also being used as aerators and/or mixers within various facilities."

According to Koepke, Nidec foresaw the DOE's switch to premium efficiency regulations, and the need for constant-speed pumping. The SINEWAVE OPTIMIZED Series has been in development for quite some time.

"Lots of research and development went into this series due to problems we saw with premium motors being run on variable-frequency drives in the field," he says. "We were seeing that many premium motors being run on an inverter began having bearing failures within 18 to 24 months based on stray ground currents that arc through the bearings and cause fluting."

While the SINEWAVE Series is ideal for constant-speed pumping applications, there is still a need for motors that can handle variable-speed applications. That's why Nidec also builds and stocks U.S. MOTORS inverter-duty motors in sizes from 15 to 600 hp, with features designed to protect against the punishing effects of pulse-width modulation waveforms generated by inverters. Koepke says that the varied options give operators a full set of Nidec products when they need additional efficient power.

"We've heard a lot of positive feedback because we're helping save treatment facilities money every year that can be used for other improvements within a facility," he says. "Downtime is a big factor, and the longer a motor continues to run with minimum maintenance, the better the whole facility runs. So selecting the right motor can and will improve a facility. If the energy savings can be seen with one motor, what will the improvement be when you change 5, 10 or 30 motors?" 888/637-7333; www.nidec-motor.com



SINEWAVE OPTIMIZED motors from Nidec Motor Corporation

people/awards

Norm Higgins, wastewater commissioner in Key Largo, Florida, passed away on Dec. 21 at age 67.

Terry A. Gagnon retired from the Watertown (New York) Wastewater Treatment Plant after 27 years of service.

Hussey Gay Bell received the 2017 American Council of Engineering Companies Georgia Engineering Excellence Award in the Waste and Storm Water category for its design of the Sterling Creek Water Reclamation Facility in Richmond Hill.

The town of **Siler City** received a \$1.5 million grant for wastewater system upgrades through the Community Development Block Grant-Economic Development program, administered by the North Carolina Rural Infrastructure Authority.

The town of **Cairo, West Virginia**, will get a new underground wastewater treatment plant by way of a \$1.5 million federal Small Cities Block Grant.

Kristin Eichelberger was hired by Atchison, Kansas, as wastewater treatment plant operations superintendent. She replaces **Rosemary Gary**, who retired after almost 40 years working for the city.

Adam Downey was hired as wastewater superintendent in Monticello, Indiana.

The **Stevens Point (Wisconsin) Wastewater Treatment Plant** was honored as a Utility of the Future Today by a partnership including the National Association of Clean Water Agencies, the Water Environment Federation and WateReuse, with input from the U.S. EPA.

The city of **Grosse Pointe Woods** received a \$993,060 Storm, Asset Management and Wastewater Grant from the Michigan Department of Treasury.

Town of **Belchertown, Massachusetts**, received an award for outstanding wastewater treatment facility operations from the U.S. EPA, based on a nomination from the state Department of Environmental Protection. The agency praised **Rollin DeWitt**, plant superintendent, and his staff.

The **Eastsound Sewer and Water District** received a 2015 Outstanding Wastewater Treatment Plant Award from the Washington State Department of Ecology.

Mark Holt, superintendent of the Jay (Main) Sewer Department, received an Operator Award for Outstanding Achievement from the New England Water Environment Association.

Kyle Pritchett, wastewater management supervisor in Corsicana, Texas, was named the city's environmental services director in early January.

Paul Howard of Haverhill received the 2016 Massachusetts State Leadership Award from the New England Water Works Association. Howard is senior vice president and co-founder of the Tata & Howard consulting engineering firm.

FOX Engineering Associates and the city of **Hills, Iowa**, received the

events

April 4-5

Nevada Water Environment Association Annual Conference, Gold Nugget Hotel, Las Vegas. Visit www.nvwea.org.

April 8-11

Residuals/Biosolids Conference 2017, presented by the Water Environment Federation, the Pacific Northwest Clean Water Association and Northwest Biosolids, Washington State Convention Center, Seattle. Visit www.wef.org.

April 9-12

Alabama Water Environment Association Annual Conference, Orange Beach. Visit www.awea-al.com.

April 9-13

Kentucky Water and Wastewater Operators Association Annual Conference, Crowne Plaza Hotel, Louisville. Visit www.kwwoa.org.

April 18-21

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

April 18-20

AWWA Montana Section Annual Conference, Best Western Heritage Inn, Great Falls. Visit www.montanawater.org.

April 23-26

Florida Water Resources Conference, presented by the Florida Water Environment Association, Florida Section of the American Water Works Association, and Florida Water and Pollution Control Operators Association, Palm Beach County Convention Center, West Palm Beach. Visit www.fwrc.org.

April 24-26

Illinois Wastewater Professionals Conference, presented by the Illinois Water Environment Association and the Illinois Association of Water Pollution Control Operators, Crowne Plaza, Springfield. Visit www.iweasite.org.

April 24-26

AWWA Financial Management: Cost of Service Rate-Making Seminar, Courtyard Marriott New Orleans Downtown Convention Center. Visit www.awwa.org.

April 24-27

Alaska Water Wastewater Management Association Annual Conference, Captain Cook Hotel, Anchorage. Visit www.awwma.org.

April 24-28

AWWA Alaska Section Annual Conference, Captain Cook Hotel, Anchorage. Visit www.awwma.org.

April 24-28

AWWA New York Section Annual Conference, Saratoga Springs City Center. Visit www.nysawwa.org.

April 25-27

AWWA Pennsylvania Section Annual Conference, The Hershey Lodge and Convention Center. Visit www.paawwa.org.

April 25-28

California Water Environment Association Annual Conference, Palm Springs Convention Center, Palm Springs. Visit www.cwea.org.

2017 American Council of Engineering Companies Honor Award for Engineering Excellence for the Hills Municipal Water System.

Bill Breeden, superintendent of the Chillicothe (Missouri) Wastewater Department, retired in January after 43 years.

Bryan Creed retired from his position as public utilities director for the city of Commerce, Texas.

Deborah Hoag was named director of Public Works for State College, Pennsylvania. She previously served as utilities division manager for the city of Reading.

The **Hillsdale Water Treatment Facility** in Gardner, Kansas, received a Quality Achievement Award for its fluoridation practices from Oral Health Kansas and the Kansas Department of Health and Environment Bureau of Oral Health. Gardner was one of 20 cities in Kansas recognized in 2015 and received the same award for 2014.

The city of **Fairborn, Ohio**, received the Water Fluoridation Quality Award from the U.S. Centers for Disease Control and Prevention for 2015, its eighth consecutive recognition.

Kyle Cook, water treatment superintendent for the town of Waynesville, North Carolina, was named 2016 Employee of the Year. He has worked for the town for 33 years.

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. tpo

Submersible Pressure Sensor for Liquid Level Indication

- Compact size & simple "drop in" installation
- Class 1, Division 1 approvals
- Simple field zero adjustment
- Compatible with water, wastewater & many chemicals
- Data from BinView cloud or Binventory PC software



Plus!
Ultrasonic, float, and magnetostrictive level sensors

BINMASTER
www.binmaster.com
info@binmaster.com
800-278-4241

©2017 BinMaster, 7201 N 98th St., Lincoln, NE 68507

Need Temporary Wastewater Filtration?

Rent AquaDisk® Cloth Media Filters

- Economical option for short term needs
- Available in 6-disk (1.5 MGD) and 12-disk (3.0 MGD)
- Utilizes OptiFiber® chlorine resistant pile cloth media
- Effective TSS and phosphorus removal and capable of reuse/recycle
- Package units ship fully assembled with automatic controlled PLC
- Small footprint for inside or outside operation

Renting is an ideal solution during plant upsets, existing filter rebuilds or validating cloth media technology for an application.



AQUA-AEROBIC SYSTEMS, INC.
A Metawater Company

aquadisk4rent.com | 800-940-5008

FREE SUBSCRIPTION:
Visit tpomag.com or call 800-257-7222

ADDRESS CHANGES:
Email nicole.labeau@colepublishing.com; or call 800-257-7222; or Submit to TPO, P.O. Box 220, Three Lakes, WI, 54562

TREATMENT PLANT OPERATOR **tpo** APRIL CLASSIFIED ADVERTISING

BLOWERS

We purchase your old Hoffman and Lamson blowers. Send model information to info@berrymanequipment.com or call 800-605-0099. Berryman Equipment Company. (o04)

COVERS

POND & TANK COVERS: Industrial & Environmental Concepts makes gas-collection covers, odor-control covers, heat-retention covers and anaerobic digester covers. Call 952-829-0731 www.ieccovers.com (oBM)

EDUCATION

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

MISCELLANEOUS



Arkal set of (8) 3" Spin Klean automatic disc filters with 4" stainless steel manifolds and Alex-Tronix controls. 2 units available \$5,400 each

For more information call 863-984-8994, FL o04

SERVICE/REPAIR

Dynamic Repairs - Inspection Camera Repairs: 48 hour turn-around time. General Wire, Ratech, RIDGID, Electric Eel Mfg., Gator Cams, Insight Vision, Vision Intruders. Quality service on all brands. **Rental equipment available.** For more info call Jack at 973-478-0893. Lodi, New Jersey. www.dynamicrepairs.biz (MBM)

Rebuilds Parts



Belts



K&S Komline-Sanderson

1 800 225 5457
www.komline.com

De-Chlorination

Know Your Process is in Control with Two mini's

ChemScan mini LowChlor
Range: 0.005-2.0 mg/l

ChemScan mini Sulfite
Range: 0.01-4.0 mg/l



Avoid Excessive Chlorine and Sulfite in Your Final Effluent

For more information contact:

asa ANALYTICS

Ph: 800-665-7133
Email: info@chemscan.com
www.asaAnalytics.com

Submit your classified ad online!
www.tpomag.com/classifieds/place_ad

Operators EVERYWHERE Trust USABlueBook®

In 2011, Algonquin's Wastewater Treatment Facility was nominated for Class 1 Plant of the Year by IAWPCO (Illinois Association of Water Pollution Control Operators). Criteria for such nominations include exemplary levels of compliance and cleanliness, operator certifications, and ongoing safety programs. Through their hard work and dedication, the team at Algonquin has shown that they're up to the challenge of continued success.

Leading the crew is Chief Wastewater Operator Ed Brown. He works closely with USABlueBook to make sure his team always has the supplies they need to keep their facility up and running. "It's great to know that even when I don't know who to call, I can just call USABlueBook," shared Ed.

**"I ordered parts in the morning,
and they were here later that afternoon!"**

Whether the team is ordering new chemical feed scales, or miscellaneous items for around the plant, USABlueBook has them covered. "My biggest surprise is always USABlueBook's shipping. I ordered parts in the morning, and they were here later that afternoon! When one of our guys said 'The parts are here,' I said, 'What parts?'" Ed laughed.

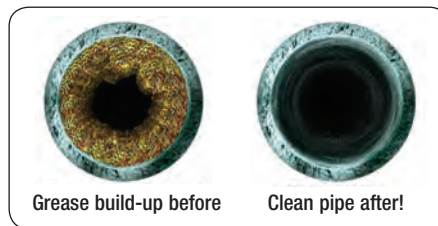
Ed Brown
Chief WW Operator
Algonquin WWTP
Algonquin, IL

Featured Products From USABlueBook®

Stop grease problems before they start!

Jetfoam, EHC-33 and Big Blue Bio-Blocks remove grease build-up to keep your lines clean and running at full capacity. These environmentally friendly products eliminate stoppages, unpleasant odors and untimely service interruptions. Use separately, or together for a powerful 3-step solution.

For more information on these products, see pages 235-236 in Master Catalog 128.



1 Jetfoam Emulsifier

Use with a sewer jetter to liquefy grease and keep it in suspension. Non-corrosive surfactant blend lets you clean twice as much sewer in the same amount of time.



| DESCRIPTION | STOCK # | EACH |
|---------------|---------|-----------|
| 5-Gallon Pail | 48163 | \$ 135.95 |

2 EHC-33 Bioenzyme

Breaks down proteins, fats and carbohydrates. Industrial-strength bacteria live and reproduce in an environment without free or dissolved oxygen.



| DESCRIPTION | STOCK # | EACH |
|---|---------|-----------|
| 25-lb Pail of 50 8-oz Quick-Dissolve Bags | 48165 | \$ 399.95 |

3 Big Blue Bio-Blocks

Dissolve over 30 to 90 days to continuously add grease-fighting bacteria. Perfect for lift stations or wet wells.



| DESCRIPTION | STOCK # | EACH |
|-------------|---------|-----------|
| 5-lb Block | 49828 | \$ 101.95 |
| 10-lb Block | 49829 | 201.95 |
| 30-lb Block | 49831 | 401.95 |



USABlueBook®
Get the Best Treatment™

800-548-1234 • www.usabluebook.com