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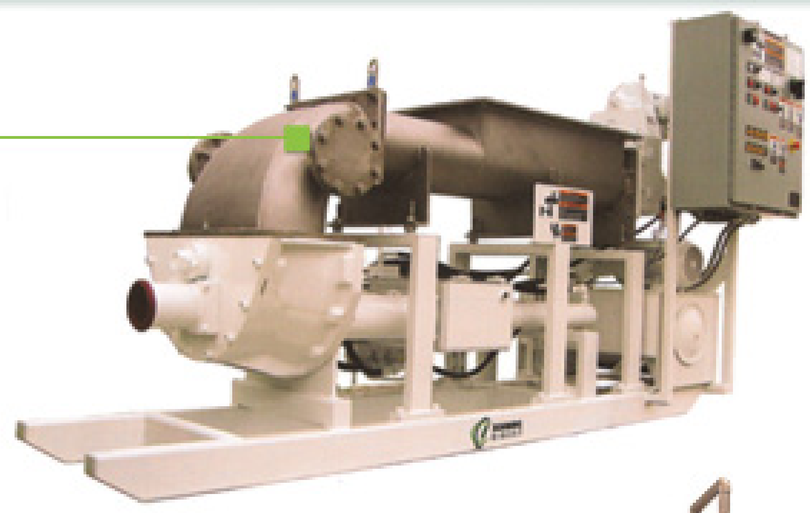

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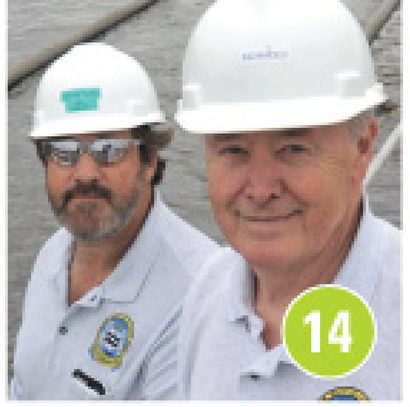

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on the cover

John McClellan, operations superintendent at the Everett (Wash.) Water Pollution Control Facility, leads a team of forward-thinking solids management personnel who run an exemplary program day to day and constantly look for better ways of doing things. (Photography by Kevin Nortz)

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Fishable, Swimmable: What a Concept!

WASTEWATER TREATMENT HAS TRANSFORMED THE NATION'S LAKES AND STREAMS. TELL US ABOUT THE SPECIAL HABITAT YOUR CLEAN-WATER PLANT IS PROTECTING.

By Ted J. Rulseh, Editor

As a boy in a small Wisconsin town on Lake Michigan, I nearly lived on the river. (The section of stream in my neighborhood was actually an estuary, and I grew up thinking it was normal for a river current to reverse direction rhythmically.)

Anyway, my neighborhood chums and I spent our summers fishing for bullheads and carp, angling for crayfish with liver tied to pieces of string, floating on makeshift rafts, and building huts out of sticks and marsh grass.

But never swimming. Our parents wouldn't allow it. The water was too polluted, they said. This was back in the 1960s, when people seemed to accept polluted water as a fact of life, as part of the price of "progress." Then along came the Clean Water Act and the idea that the nation's waters should, by all rights, be fishable and swimmable — that in the long run anything less was not to be tolerated.

I was a senior in high school at the time of the first Earth Day, when the phrase "fishable and swimmable" joined the lexicon. It seemed like nothing more than common sense, and sure enough, just like that, the nation's perception changed. No longer would it be acceptable to treat rivers like open sewers for the sake of "economic prosperity."

WATERS TRANSFORMED

Change happened, if not overnight, then with remarkable speed. The most obvious success, of course, was Lake Erie. I learned in grade school that Erie was a "dead lake." Not so many years after the Clean Water Act took effect, it became the walleye capital of the world. I even have a hat that says so — a souvenir from a charter-fishing trip I took with friends a few years ago.

As for my own little river, well, that has changed, too. It's still full of carp and bullheads, of course, being a small, slow

stream that winds through marshland and farm country. But now it's also home, in season, to smallmouth bass.

I moved back to my home area after 28 years of living the suburban life near Milwaukee, and every year since I've fished the river for smallmouths. Right around Memorial Day, when the water has warmed up, I find them at a couple of riffles upstream from a bridge a mile or so north of town.

I wade against the gentle current, casting for them with a jointed floating minnow plug. I won't claim that I catch them by the bushel, but I always get a few (and I always release them). It's a late-spring ritual I greatly enjoy. There are better places to catch smallmouths, but I visit the river in part to celebrate its regeneration.

In a future issue of *TPO*, we'd like to report on the fish and wildlife habitats, the fishing hotspots, the public recreation areas, and the scenic places that are better because a wastewater treatment plant, day after day, works the miracle of turning a community's sewage into clean water.

I'm sure the bass are there in part because the community of 700 people five miles upstream now has better wastewater treatment than it did when I was a kid. I suspect the water is also fine for swimming now (although pollution from farm runoff remains an issue).

LET'S CELEBRATE

My little river is just one of many that wastewater treatment has reclaimed. I can only imagine the stories treatment operators could tell about the great lake and river habitats downstream from their plants.

And here is your chance to tell those stories. In a future issue of *TPO*, we'd like to report on the fish and wildlife habitats, the fishing hotspots, the public recreation areas, and the scenic places that are better because a wastewater treatment plant, day after day, works the miracle of turning a community's sewage into clean water.

To make your contribution, just drop me a note describing your downstream environment and how your treatment plant protects it. I don't need anything fancy — if we need more information, someone will follow up with you. Please also send a picture or two of your special place.

Send your material to editor@tpomag.com. Remember, this doesn't have to be a success story on the scale of Lake Erie. We're interested in any story about a precious stretch of water you're protecting. Even if it's a little no-account river like mine. **tpo**

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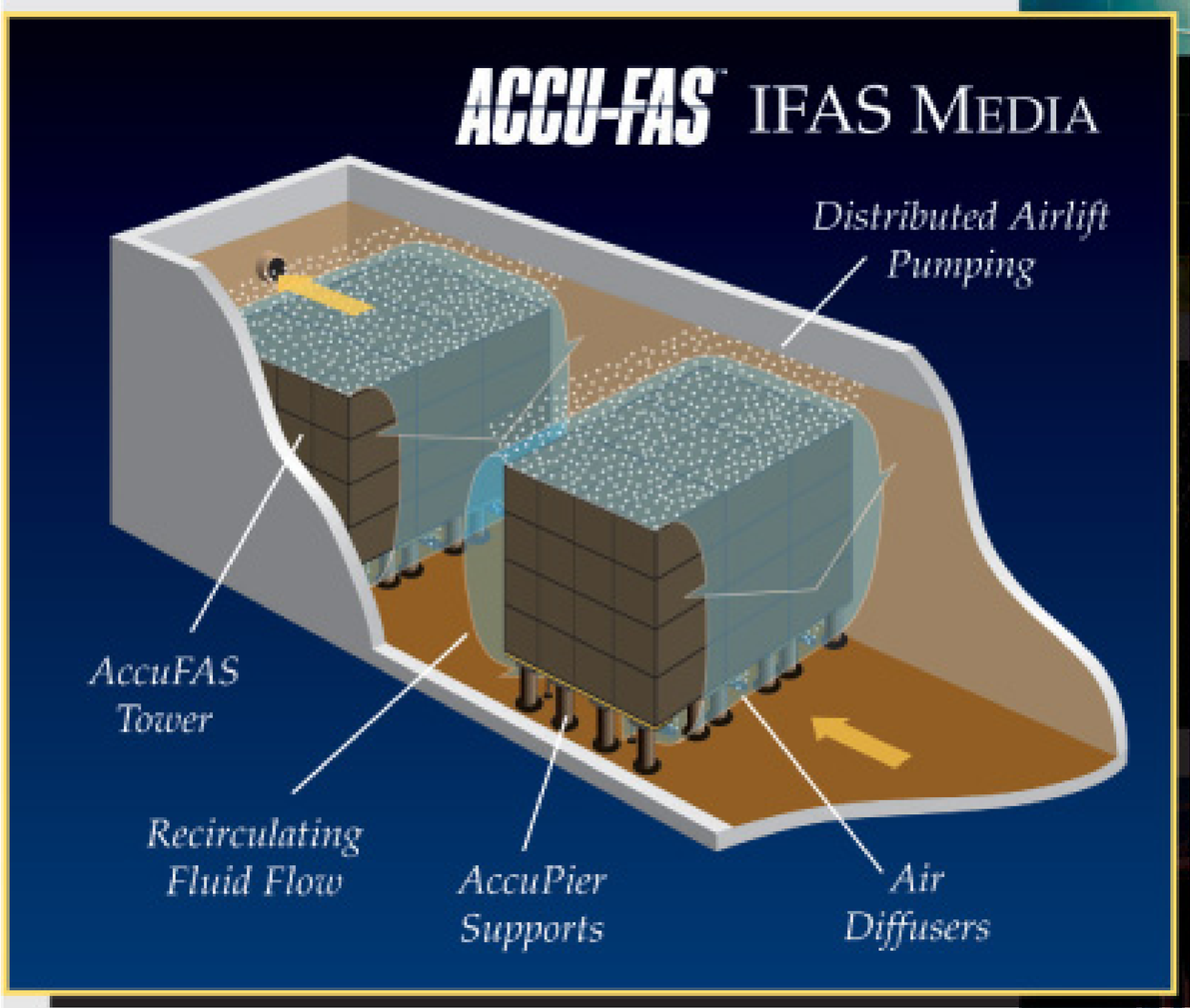

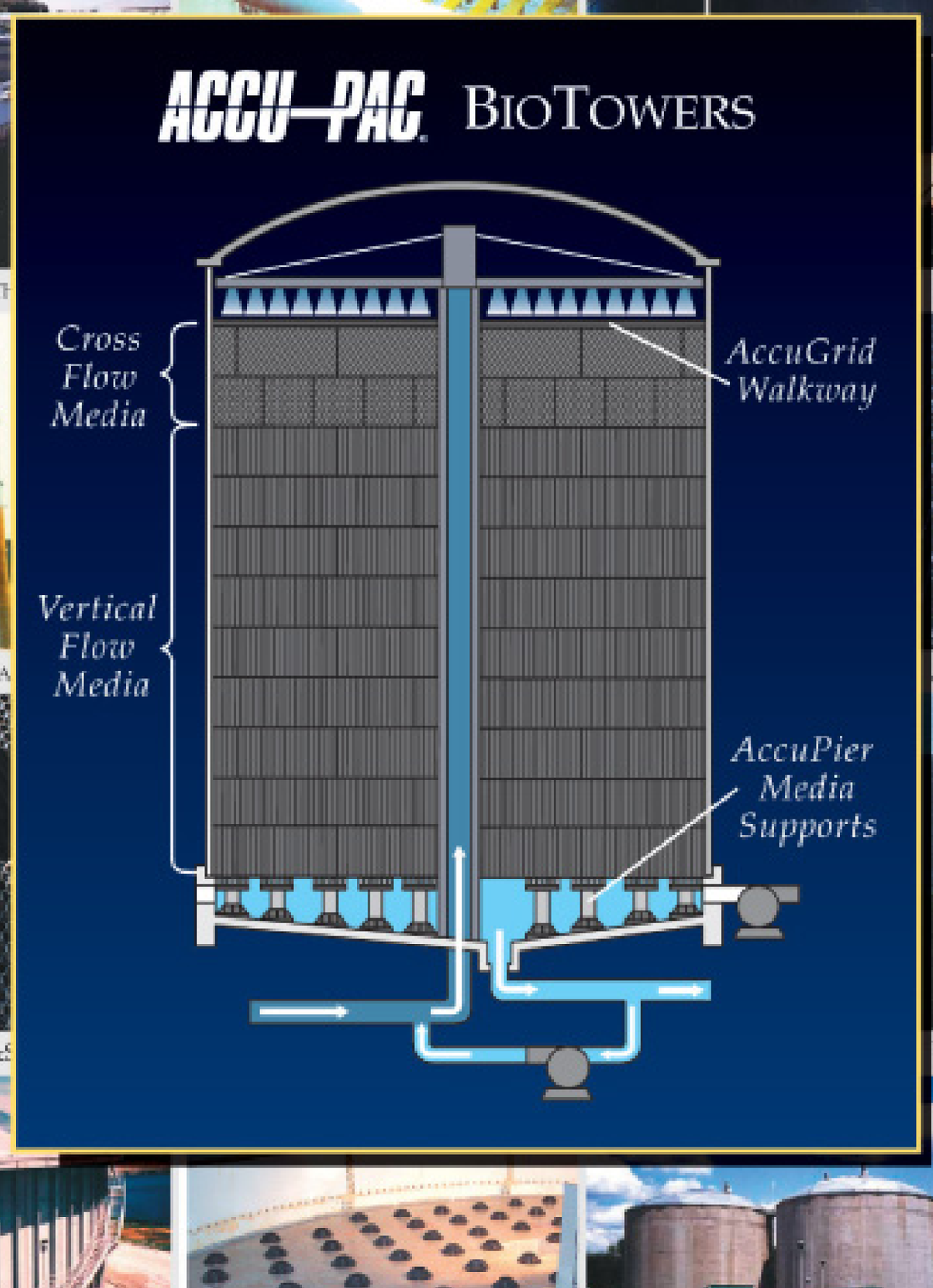

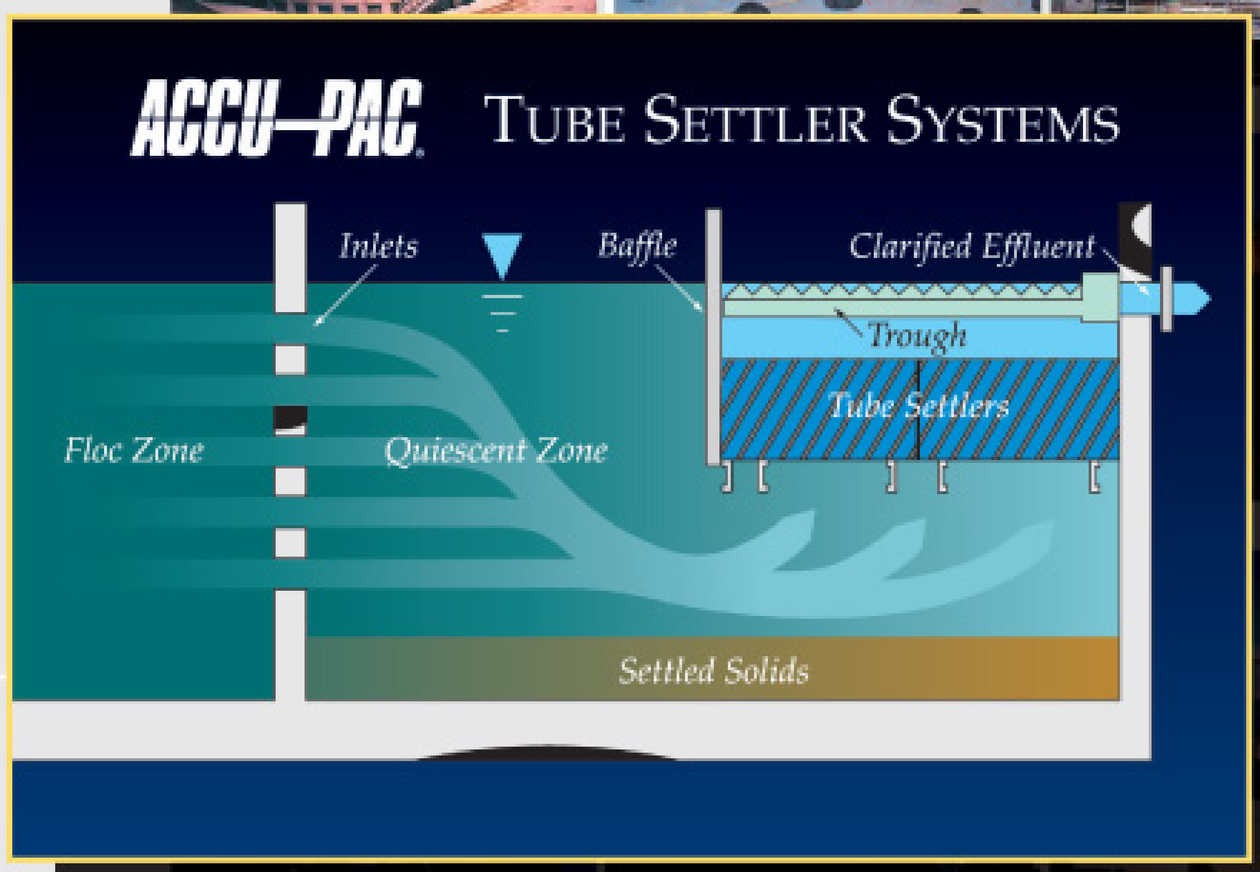

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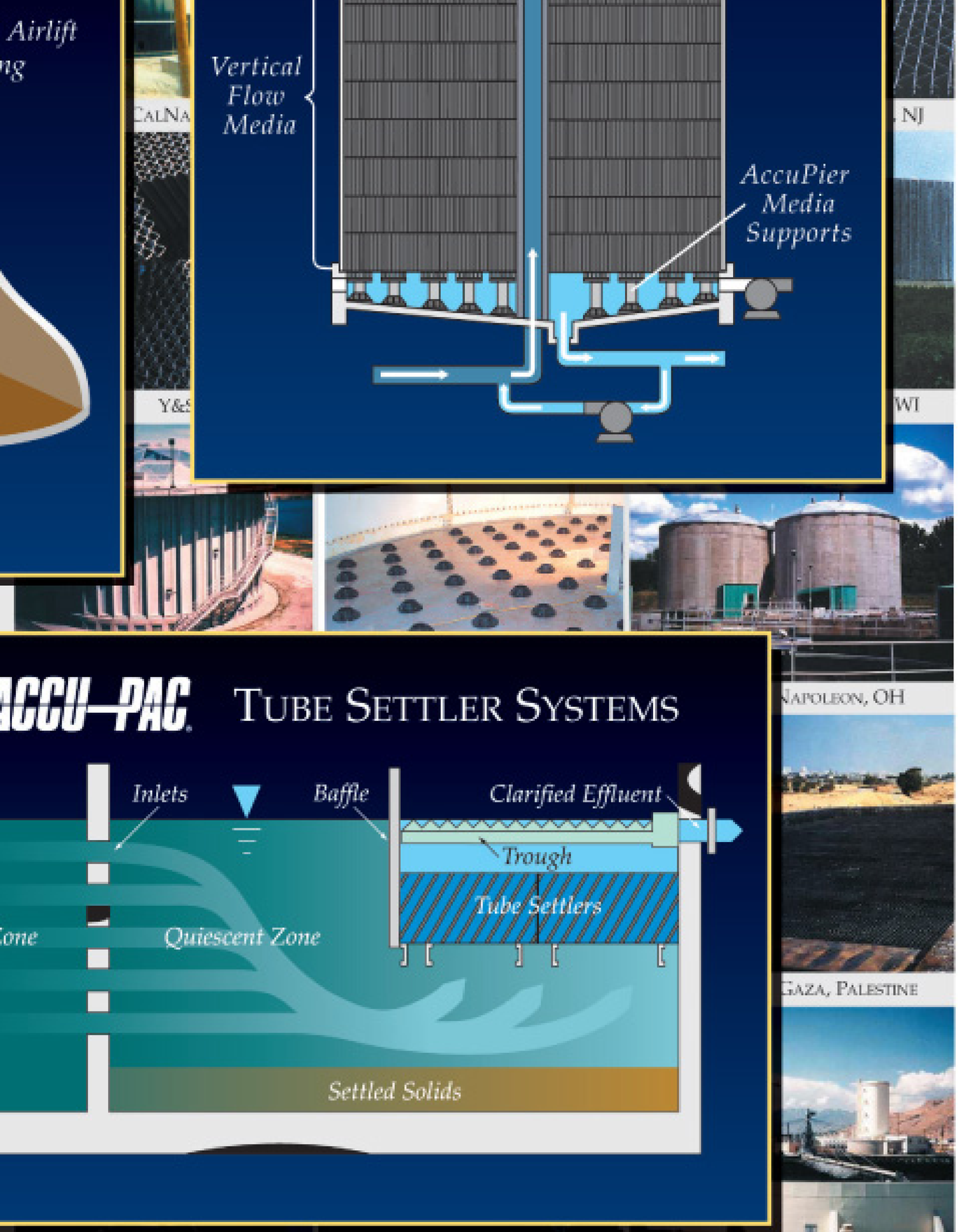

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Water Heroes

THE MASSACHUSETTS WATER RESOURCE AUTHORITY REACHES INTO THE SCHOOLS AND BEYOND WITH CRITICAL MESSAGES ABOUT WATER AND ENVIRONMENTAL PROTECTION

By John K. Thompson

The Massachusetts Water Resource Authority has a challenging job as a public authority providing water and sewer services to 2.5 million people and more than 5,500 large industrial users in 61 metropolitan Boston communities.

Charles Tyler, environmental educator at the authority's Deer Island Wastewater Treatment Plant, has done his job so well that he has been named a Water Hero by the Water Environment Federation.

The awards go to the professionals "who protect public health and the environment by cleaning the world's water day after day." Tyler freely acknowledges that he doesn't do it alone. "We have many water heroes here at MWRA," he says. "When I think of water heroes, I think of our own 22-year-veteran educator, Meg Tabacsko, who has positively influenced wastewater attitudes of more people than any three other people I know. True, it's her job, but she does it well, and tirelessly."

GETTING TO THE KIDS

Tabacsko is the interface between the MWRA and the public and private school systems in the service area. With only nominal help, she conducts, maintains and markets the MWRA education outreach programs.

"Through her programs, children learn the principles of environmental stewardship and carry that message home to their families," Tyler says. "There may be no more effective tool in the environmental field than the education of our youth at an age when they will absorb and remember the concepts and principles that are so important to our continued survival."

The program has been successful despite staffing cutbacks resulting from recent economic pressures. Tabacsko schedules and performs hands-on training programs for elementary and junior high school students in their classrooms and arranges short field trips near community schools.

The mission, according to Tabacsko, "is to emphasize the interrelationship of drinking water, wastewater and recreational waters, using practical methods that include classroom or field experiments with simple water tests, such as pH, turbidity and dissolved oxygen." The program is constantly in demand.

PHOTOS COURTESY OF MASSACHUSETTS WATER RESOURCE AUTHORITY

Since 1996, more than 50,000 visitors have toured the Deer Island Wastewater Treatment Plant including about 2,600 in 2008.

"I leave most classes with the satisfaction of knowing that I taught kids something and they didn't even realize they were learning."
MEG TABACSKO

"I leave most classes with the satisfaction of knowing that I taught kids something and they didn't even realize they were learning," Tabacsko says. "I think one fifth-grader summed it up very well. As we walked away from the lesson, he told me that was the best nature lesson he'd ever had. He told me that he would flush a toilet every day for the rest of his life and he would think of me every time he did!"

ON THE PROPERTY

Beyond school outreach, MWRA programs include publishing items such as a Household Hazardous Wastes booklet and several

What's Your Story?

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

introductory books for youth, like *Duayne the Storm Drain*, and *Dottie the Pottie*.

Another staple is the long-standing tour program at the Deer Island treatment plant, which represents part of the authority's $3.8 billion investment to protect Boston Harbor against pollution. The Deer Island plant becomes the stage for much of MWRA's public educational effort.

Tours started in 1996 while construction was still underway and continue today. All told, there have been more than 50,000 visitors, about 2,600 of them going through last year. Tours have included student groups, ratepayers, environmental and engineering groups, and international visitors.

Tours require security credentials and are led by MWRA staff, which sometimes includes plant operators. A group will move through a part of the plant that is undergoing maintenance, and technicians will explain what's being done.

Tours through the control room may be led by other staff, but operators describe the equipment and processes in detail. During the week, about 250 staff members work at Deer Island: operators, maintenance technicians, engineers, laborers and managers. On weekends, the plant runs with a skeleton crew of six.

The plant property includes 5 miles of public walkways and trails for walking, jogging, sightseeing, picnicking, fishing and bicycling. Hikers get dramatic views of the Boston skyline and Harbor Islands. (Watch for more about these features in a future issue of *TPO*.)

PUTTING IT ON PAPER

The MWRA also hosts a themed poster and writing contest for public and private elementary and junior high school students each year. Participation is heavy, and panels of judges made up of MWRA personnel and volunteers get together for sometimes heated discussions about the merits of the entries.

Winners enjoy a springtime awards ceremony at Deer Island where entries are on display. The day includes photo sessions, a continental buffet, and a ceremony in which students receive prizes and certificates.

Tyler and Tabacsko believe the program cost-effectively sends a positive message to the community through the ambassadorship of the prize winners and their families, some of whom may become tomorrow's water heroes.

Through MWRA's outreach, students learn to perform simple water tests, such as pH, turbidity and dissolved oxygen.

"Allowing folks to see the history and science behind what we do, and expanding their views beyond 'that big, expensive, stinky place where the do-do goes,' is like opening a door that connects them with their environment."

CHARLES TYLER

"Helping people understand the impact of their daily lives on the environment, and presenting frankly what it is that we do on their behalf to lessen that impact, is in my opinion one of the most important parts of our communication with the public," Tyler says. "Allowing folks to see the history and science behind what we do, and expanding their views beyond 'that big, expensive, stinky place where the do-do goes,' is like opening a door that connects them with their environment." tpo

top performer: **PLANT**

Reinhold Betschel, Kent County assistant public works director, at the outfall of the 16.3 mgd Kent County Wastewater Treatment Facility. (Photography by Todd Dudek)

A Mix of *Cultures*

profile

Kent County Wastewater Treatment Facility, Milford, Del.

POPULATION SERVED:	130,000
TREATMENT LEVEL:	Advanced, Class IV
FLOWS:	16.3 mgd design; 11.3 mgd average
PLANT PROCESS:	Biolac extended aeration (Parkson Corp.)
BIOSOLIDS:	Dewatering, thermal drying, land-applied as Kentorganite
EMPLOYEES:	55
MANAGEMENT:	Hans Medlarz, P.E., public works director; Reinhold Betschel, assistant public works director; Keith Powell, plant superintendent; James Newton, environmental program manager; Bill Vincent, operations supervisor; Mike Harrington, maintenance supervisor
ANNUAL BUDGET:	$9.5 million
WEB SITE:	www.co.kent.de.us

A truck loaded with biosolids leaves Kent County treatment plant.

ON THE WORLD STAGE, THE KENT COUNTY (DEL.) TREATMENT PLANT IS A LEADER IN INNOVATION AND SUSTAINABILITY. ITS CROSS-CULTURAL APPROACH HAS PAID HUGE DIVIDENDS.

By Jim Force

COMBINE THE EUROPEAN SENSE OF SUSTAINABILITY WITH THE AMERICAN SPIRIT OF INNOVATION AND what do you get? In the clean-water profession, it's the Kent County Wastewater Treatment Facility in Milford, Del.

Benefiting from the best of both cultures, the plant has made huge improvements from the old days when its performance was not always up to standard. Public works director Hans Medlarz and assistant director Reinhold Betschel are originally from Germany. Their leadership — supported by superintendent Keith Powell, environmental programs manager Jim Newton, and supervisors Billy Vincent and Mike Harrington and their staffs — has resulted in a plant that won the U.S. EPA O&M award for large advanced plants in 2007.

Additionally, the worldwide wastewater treatment community looks to the Kent County facility as a model of performance excellence (see sidebar). "It's an innovative environment here," says Newton. "Our management allows us to try new things and make improvements."

FLEXIBLE PROCESS

The Kent County facility is Delaware's second largest treatment plant, taking in about 11 mgd from a service area with a population of 130,000 in Kent County and parts of New Castle and Sussex Counties.

Influent passes through a headworks section containing fine filter bar screens and centrifugal grit removal before flowing into a Biolac biological wastewater treatment system supplied by the Parkson Corporation. There are no primary clarifiers.

The Biolac system employs fine-bubble diffusion and extended retention of biological solids to provide stable, efficient operation, as well as flexibility to meet various treatment requirements such as nitrification/denitrification and nutrient removal.

Instead of fixed aerators, the system's aeration diffusers are suspended from moving aeration chains. This produces a controlled, back-and-forth motion of the diffusers and distributes the oxygen transfer and mixing energy evenly throughout the basin. As a result, the system efficiently and uniformly mixes aeration volumes associated with sludge ages of 30 to 70 days, while most extended aeration systems reach their maximum mixing capability at sludge ages of 15 to 25 days. The longer sludge age can lower effluent BOD and ammonia, and the large quantity of biomass treats widely fluctuating loads with very few operational changes.

At Kent County, the Biolac system is installed in two HDPE-lined 16-foot-deep earthen basins, each with a capacity of 10 million gallons. The solids retention time in the basins is 25 to 45 days. The system's Wave Ox process enhances biological nutrient removal. The precise control of the air distribution to the aeration chains and the dissolved oxygen content provide

AN INTERNATIONAL AMBASSADOR

The Kent County Wastewater Treatment Facility not only serves its constituents with effective wastewater management — it is a source of information and technical expertise for wastewater professionals around the world.

Visitors from four continents have come to the plant to learn more about the Biolac treatment process. Moreover, Reinhold Betschel, assistant public works director, was part of a People-to-People Citizen Ambassador Program delegation of wastewater professionals from 29 states who traveled to China in November 2008.

"Our plant has generated a lot of interest," Betschel says. "Managers from Brazil, South Africa, Germany, Bulgaria, Russia, and other countries have visited, mostly to view the Biolac process and learn more about how we operate, and make it perform so well."

One of the most refreshing parts of the visits is exposure to different water management viewpoints. Betschel recalls managers from Saudi Arabia arriving in helicopters. "When they saw the clarity of our effluent, they suggested we were crazy not to be selling it to customers, rather than just letting it go downstream," he recalls.

The delegation to China visited three treatment plants: Beijing (275 mgd), Shanghai (528 mgd and the largest plant in the country), and Guilian, a pleasant city of 750,000 in southern China. "The Beijing and Shanghai plants use activated sludge and UV disinfection," says Betschel. "I was impressed with how clean and organized everything was. We saw marble floors and polished equipment. All the managers and operators were dressed in clean uniforms."

China has 2,000 wastewater treatment plants, as opposed to more than 16,000 in the United States. Betschel says plants were in the middle of cities and neighborhoods, not out on the perimeter as is often the case here. "They had very good odor control," he recalls.

Another difference was more local control, as opposed to regional or national. "Their EPA acts as a policeman, but local authorities can shut down or fine polluters," Betschel says.

About 80 percent of the biosolids produced in China are landfilled, and the rest are incinerated or land-applied. The delegation learned that China now requires anaerobic digestion and power recovery on larger plants.

Betschel stays in contact with his Chinese colleagues by e-mail, exchanging technical and operational information, and he has invited them to visit the Kent County plant. "I hope they come," he says. "They will be welcome. They were professional and gracious hosts for us in China."

A Pulsafeeder controller (Pulsafeeder Inc.) inside the pumping building.

moving waves of multiple oxic and anoxic environments in the two basins, promoting nitrification, denitrification and biological phosphorus removal.

"The system is very easy to operate," says Newton. "The only significant change we've made is with the dissolved oxygen control system. The staff used to monitor DO at the end of the aeration process, but that was like driving a car while looking in the rear view mirror," says Betschel.

At the suggestion of the supplier, Dresser Roots., the Kent County team moved the DO sensors to the front of the process and now controls the air supply based on what the process actually needs. Betschel says the modification has saved at least 10 percent in electrical costs, and diffuser upgrades have made the aeration system 25 percent more efficient.

Solids settle out in four peripheral-feed circular clarifiers, and a chlorination-dechlorination system disinfects the overflow before discharge to the Murderkill River, which flows to Delaware Bay and the ocean. High-quality effluent is the hallmark here; BOD and TSS average in single digits.

"Our goal is to reduce our environmental and health and safety footprint, especially as it affects our employees and neighbors. That drives our efforts to move to sustainable energy sources, reduce power consumption, and eliminate handling chlorine."

JAMES NEWTON

Holding tanks provide temporary storage of biosolids, and ferric chloride is added before dewatering on Ashbrook belt filter presses. A recently renovated pugmill mixes lime with the biosolids for stabilization. Indirect-heat dryers remove additional moisture, resulting in a granular, 50 percent solids final product called Kentorganite. The plant staff hauls and spreads the material on county lands and more than 100 area farms. The farmers pay the transportation and application costs. "We can't make enough to meet demand," says Newton.

NEW LOOK

Plant operation wasn't always this efficient and effective. Built in 1973, the original facility had some problems and violations, but things began improving with changes in management and operational philosophy about 10 years ago.

Betschel recalls some of the early progress. "Soon after Hans arrived, he suggested we start making improvements, beginning with the 550 miles of force mains we maintain," he says. "We convinced our commissioners to allocate the necessary funds and made improvements to reduce overflows. After that, we went after the 85 pump stations, replacing the old pumps over time with machines from ITT-Flygt and EMU."

More repairs and improvements followed, some bringing out the ingenuity of the staff. "We realized we needed to clean the aeration basins, but we couldn't find any guidelines for doing so," Betschel says. "Since they are HDPE- lined, we had to be careful. A metal bucket might have damaged the material, so we developed a wood and rubber modification that was more suitable."

Operations supervisor Bill Vincent (left) and assistant public works director Reinhold Betschel help promote a culture of innovation and sustainability.

Kent County Wastewater Treatment Facility
PLANT PERFORMANCE (Monthly Average)

	INFLUENT	EFFLUENT	PERMIT
BOD mg/l	227 mg/l	2.75 mg/l	18.4 mg/l
TSS mg/l	225 mg/l	4.50 mg/l	20 mg/l
Total N mg/l	35 mg/l	2.23 mg/l	5.50 mg/l
Total P mg/l	7 mg/l	0.19 mg/l	0.46 mg/l

Some members of the staff at the Kent County Public Works Wastewater Division: Front from left, Chris Horsey, operator; Rodney Wyatt, biosolids operator; James Nunes, operator; Mari Fabres, secretary; and Reinhold Betschel, assistant public works director. Back, Harold Venable, operator; Tony Richardson, operator; Jim Newton, environmental program manager; and Bill Vincent, operations supervisor.

Vincent and Betschel in the treatment plant pump building.

"When visitors see our effluent stream, they sometime question why we make water that is much cleaner than our permit requires. I simply tell them that we want to be the best that we can be."

REINHOLD BETSCHEL

The team also improved the grit removal apparatus. On top of all this, Betschel adds: "We diligently practice our Environmental Health and Safety Management System (EHS-MS) Policy to continuously improve. That applies to our processes, our equipment and our people."

PUSHING SUSTAINABILITY

As well as the plant operates today, the Kent County team is not even close to completing the improvements. Next up: a more sustainable operation. "The Germans have a well-developed sustainability ethic," explains Newton. "That is driving a number of things we plan to look at including renewable energy sources like wind and solar."

Newton says they will try solar-generated heat on biosolids, with the idea that moisture can be driven from the material naturally in a passive solar greenhouse, instead of the current natural gas-fired processes.

"At night, we plan to use heat from our aeration blowers," he says. Solar power will also be instrumental in a new disinfection configuration. Newton explains that Kent County will soon move to ultraviolet light instead of chlorine, and solar panels will power the UV system. Its UV lamps will be illuminated by microwaves, which do not buildup solids on the tubes, resulting in higher efficiency.

Over the last year, the plant has been gathering data from a wind anemometer mounted on one of the radio towers. "The Department of Energy says our area is marginal for wind, but we want to look at the data to see if wind power might be feasible," says Newton.

In still another project, the plant has applied for a DOE grant under the 2009 economic stimulus program to use the water in the contact chambers as a heat pump. Buildings will obtain supplemental heating and cooling by heat exchange against geofluid (geothermal fluid) passing through the treatment basins.

These improvements correlate closely with the value Kent County places on certification. Newton explains that the plant is certified as ISO 14001 EMS (Environmental Management System), OSHA Assessment System 18001, and the National Biosolids Program EMS program. "We were the first to get all three," he says.

GUIDING PRINCIPLES

The impact on plant operations is clear. "Our goal is to reduce our environmental and health and safety footprint, especially as it affects our employees and neighbors," Newton says. "That drives our efforts to move to sustainable energy sources, reduce power consumption, and eliminate handling chlorine."

The model for these actions is the Natural Step framework for sustainability developed in Sweden (www.naturalstep.org). The framework has four principles:

- Eliminate our contribution to the progressive buildup of substances extracted from the earth.
- Eliminate our contribution to the progressive buildup of chemicals and compounds produced by our society.
- Eliminate our contribution to the progressive physical degradation and destruction of nature and natural processes.
- Eliminate our contribution to conditions that undermine people's capacity to meet their basic human needs.

"We've adopted these principles as a fundamental part of our management philosophy," Newton says. Betschel puts it another way: "When visitors see our effluent stream, they sometime question why we make water that is much cleaner than our permit requires. I simply tell them that we want to be the best that we can be." tpo

more info:

Ashbrook Simon-Hartley
800/362-9041
www.ashbrookcorp.com

Dresser Roots
(765) 827-9200
www.dresserroots.com

ITT Water & Wastewater U.S.A. – Flygt Products
203/380-4700
www.us.ittwww.com

Parkson Corp.
954/974-6610
www.parkson.com

Pulsafeeder
941/575-3800
www.pulsa.com

Wilo EMU USA LLC
866/476-0323
www.wilo-emu-usa.com

Public fishing areas are among the amenities at the New Bedford Pollution Control Facility.

Perfect Fit

A MASSACHUSETTS CITY FACING A U.S. EPA CONSENT DECREE BUILDS A NEW TREATMENT PLANT SURROUNDED BY A SCENIC BEACHFRONT PARK

PHOTOS COURTESY OF CITY OF NEW BEDFORD

By Mary Shafer

In 1990, the City of New Bedford, Mass., turned a U.S. EPA consent decree into an opportunity to merge NPDES permit compliance with the public's need for open space. The result is a technologically advanced secondary wastewater treatment plant, preservation of an important historic site, and a 50-acre waterfront park that has helped revitalize the region and enhance economic growth.

The city is the largest municipality in the Buzzards Bay Watershed and accounts for 37 percent of its population. Serving 100,000 people, the 30 mgd (design) wastewater treatment plant averages 22 mgd.

By 1988, the plant was out of compliance with the Clean Water Act of 1972. With the consent decree, New Bedford had to decide how to build a new treatment plant on a site occupied by the old facility, various abandoned military structures, and a neglected but historically significant fort.

The New Bedford plant before (above) and after rebuilding.

RAZE AND REPLACE

Public works authorities partnered with Cambridge engineering firm CDM to begin planning in 1990. Water division superintendent Jim Ricci was the plant's team liaison, overseeing demolition, construction and other development work.

The limited property, about 60 acres, meant the original plant had to go. Construction started in 1992 on the new plant, which went online in August 1996. The old plant was demolished in September 1997, and its location turned into the Great Lawn at the southern point of the peninsula.

The new plant has five buildings: primary aeration, treatment, dechlorination and pump house, biosolids processing, and administration. The treatment plant was designed to be unobtrusive. The gray building blends with the seaside atmosphere.

Engineered berms and an existing large underground bunker at the northern end of property, installed for gun emplacements during World War II, screens it from the neighborhood. Its chain link fence is visually low-profile. CDM contracted a landscape architect to design and install decorative plantings and vegetate the berms.

One building near the property's northeast entrance serves as a community center. In summer, it hosts Camp Kennedy, a program for city youth ages 6 to 14. This building also serves as senior center, dance hall, and conference center.

Public green space was in the facility plans from the start. "Our project eliminated a soccer field, so we had to replace it," recalls Ricci. Because the consent decree stipulated that part of the property would be used for public recreation, a park was born. Its open shoreline allows the public a unique view of the bay.

Thirty employees of Veolia Water operate and maintain the plant. Outside the fence, city crews handle lawn mowing and snow removal.

MILITARY TO MUNICIPAL

Fort Taber, the property's impressive stone structure and visual focal point, gives the park surrounding the plant its name. It's located where its precursor, Fort Rodman, stood. The fort is usually closed to the public. Little was done to it other than electrical service brought by

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A decorative brick walkway (upper) leads out to the public pier. The site also includes a snack bar and playground (lower).

public works department personnel from the treatment plant, to allow for surrounding concerts and other events.

The sheriff's department supervised a corrections work release crew to remove graffiti from the interior. The façade, lit with large floodlights at its base, has a dramatic night appearance. The base's former PX/movie theater/bowling alley was refurbished to house the Fort Taber Military Museum and a yacht club. The park also has a small café with public restrooms and nearby playground.

The pier features Washingtonian light poles.

A three-mile asphalt-paved walking/bike path winds around the plant, then out along the shoreline on both sides of the peninsula. The entire length is lined with retro Washingtonian-design street lamps. The park has a three-section, 1,000-foot beach, and two more beaches flank the peninsula. The pier was refurbished for walking and fishing.

> "On a busy weekend, hundreds of thousands of people use this whole area. On a nice July day, at least 50 to 100 people are on the beach or shellfishing."
>
> **VINCENT FURTADO**

Public events such as concerts, regattas, Boy Scout campouts, and weddings are held on the Great Lawn surrounding the fort. It also is a popular area for strolling, fishing and picnics.

"On a busy weekend, hundreds of thousands of people use this whole area," says wastewater superintendent Vincent Furtado. "On a nice July day, at least 50 to 100 people are on the beach or shellfishing."

Ricci concurs: "It's amazing how many people come to visit the park now. The fort recently logged its 10,000th visitor. My office overlooks the park, and there's always a steady stream of folks." **tpo**

Squeeze Play

A ROTARY FAN PRESS HELPS A SMALL TREATMENT PLANT IN VIRGINIA RELIEVE BIOSOLIDS DEWATERING CAPACITY ISSUES IN A COST-EFFICIENT MANNER

By Scottie Dayton

PHOTOS COURTESY OF CLASSIC VIDEOS BY BRENNER INC., KALAMAZOO, MICH.

A Prime RFP36D-SK 36-inch dual-chamber rotary fan press from Prime Solution Inc. in Richmond, Va., dewaters biosolids for director of utilities Gale Netz and his team at the Mt. Jackson (Va.) Sewage Treatment Plant.

Wastewater entering the Mt. Jackson (Va.) Sewage Treatment Plant was so high in nutrients that director of utilities Gale Netz wasted the 78,000-gallon digester daily. However, the six 25-foot-square drying beds often lost the struggle to keep up.

A 700,000 gpd (design) treatment plant with sequencing batch reactor basins and dewatering technology was in the planning stages, but until it opened in November 2008, Netz needed an economical solution to his problem.

While Netz was on duty with the National Guard in Afghanistan, town manager Charles Moore and the temporary plant operator toured three treatment plants to see belt and rotary fan presses. Impressed with the latter, they contacted Matt Winschel, the representative for Prime Solution Inc. in Richmond.

Winschel loaned the facility an older rotary fan press until the new plant could install the Prime RFP36D-SK 36-inch dual-chamber press on skids. In 2008, the old Mt. Jackson plant generated 176 tons of biosolids. By April 2009, the new facility had already surpassed that number, but the new press easily kept pace.

STRESS AND PRESS

The new plant averages 280,000 gpd from 850 residential and 50 commercial customers. Mt. Jackson has 16 miles of sewer mains and three lift stations.

Netz could fill the old drying beds in one day, but turnaround was 21 to 30 days in summer, and 60 to 90 days during the rainy months of winter. Biosolids were hauled to a landfill 10 miles away by dump truck. "We made at least one trip a week, often more," says Netz. "Every time the truck left the yard, it cost $500. It still does."

Netz returned from Afghanistan just before the loaner press arrived. "Charlie took me to see the belt and rotary presses at the other plants," he says. "From what I saw, the rotary fan press was the only way to go."

Winschel trained Netz and assistant Johnny Raines to run the dual-chamber 36-inch rotary fan press loaner. "It was pretty simple," says Netz. "If I can understand it, anybody can."

Netz and Raines mounted the loaner on a trailer. In cold weather, they pulled it from the maintenance shop to the old treatment plant because liquid inside the press froze if they left it outside. In summer, they parked the trailer next to the digester tank, attached the hoses, and started the unit's 70-gpm pumps. The men dewatered daily, running the pumps at 35 gpm.

Feed sludge, entering two rectangular channels, slowly moves between two parallel revolving stainless steel filter plates. Filtrate passes through these slotted, wedge wire plates as the flocculated material advances. Dewatering continues until the material reaches a tapered restriction zone at the outlet of the press. An adjustable, two-piece pneumatic restriction plate squeezes the material into the final dry cake.

SLICK OPERATION

Cake exiting the back of the press landed in a borrowed grain elevator that deposited it into the dump truck parked beneath it. Although a clever and smooth operation, it wasn't cost effective because of the power requirements.

"Nevertheless, I was impressed with the unit," says Netz. "It really hummed but was more sensitive than the new model, and one of us had to be there every moment. If something went wrong, it didn't

Share Your Idea

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

The Mt. Jackson plant now uses an AquaSBR sequencing batch reactor from Aqua-Aerobic Systems Inc. in Rockford, Ill.

shut itself down. The new press does, enabling us to drive by once an hour to check on it."

The men converted one drying bed to a storage area and built a roof over it. "We stored cake all winter until it stopped raining and we could haul again," says Netz. "With only five drying beds, though, we had some very intense days when it was too cold to dewater, the beds were full, and the biosolids kept coming."

The new treatment plant opened on schedule, with the Prime RFP36D-SK 36-inch dual-chamber rotary fan press a permanent fixture attached to the digesters. Netz wastes sludge to the digesters daily and starts dewatering when they are full. "With the amount of sludge we generate, we dewater every day," he says. During an 8- or 9-hour day, the press processes 19,000 to 20,000 gallons of feed sludge, producing cake as high as 30 to 35 percent solids.

"The press enabled us to go from manual labor to no labor. That's another reason why we love it."
GALE NETZ

"Those are fantastic numbers for aerobically digested sludge," says Netz. "Our waste activated sludge runs around 0.80 percent solids." The continuous dewatering process is totally enclosed, eliminating odor and reducing corrosive exposure to nearby equipment.

The self-contained press needs little attention after Netz sets its operational adjustments using a touchscreen with icons to control the programmable semi-automated self-clean cycle and the pneumatic-operated pinch valves with magnetic flow meters that equalize flow for maximum efficiency. Other icons control gear ratios for variable speed and emergency stops of the press, water, and polymer.

"The press enabled us to go from manual labor to no labor," says Netz. "That's another reason why we love it." Netz also knows that should regulations change and reduce the plant's BOD discharge permit level from its present 45 mg/l, it won't be a problem. The liquid from dewatering has zero to 5 mg/l BOD. **tpo**

more info:

Aqua-Aerobic Systems Inc.
815/654-2501
www.aqua-aerobic.com

Prime Solution Inc.
269/673-9559
www.psirotary.com

Richard Ludowese is the lone operator of the Sedgwick (Kan.) Wastewater Treatment Plant. Working by himself, Ludowese goes about his morning routine of taking samples and performing daily maintenance. His approach has been highly successful, as the Sedgwick plant has earned a "most improved" award in 2007 from the Kansas Water Environment Association. (Photography by Bo Rader)

Course Correction

MARKED IMPROVEMENTS IN WASTEWATER TREATMENT PERFORMANCE HELP A SMALL CITY IN KANSAS MEET PERMIT REQUIREMENTS AND PREPARE FOR SUBURBAN GROWTH

By Trude Witham

THE MOTTO OF THE CITY OF SEDGWICK, KAN., IS "TRADITION WITH A VISION." THAT IS REFLECTED in the city's award-winning wastewater treatment plant and the forward-thinking attitude of city administrator Jaci Reimer and plant operator Richard Ludowese.

A suburb of Wichita, this city of 1,700 offers a small-town environment close to big-city job opportunities. Its goal is to grow slowly and keep its hometown feel.

While the city's 0.3-mgd activated sludge treatment plant is also small, Ludowese and Reimer are always thinking on a larger scale. "We are constantly looking for better ways to control our process and improve plant performance," says Reimer. "With recent upgrades, regular maintenance and a quest for continual learning, today our plant looks like a state-of-the-art facility, not a 'sewer plant.'"

AN OPERATING CHALLENGE

It wasn't always this way. Before 2006, a combination of antiquated equipment, a history of part-time operators, and high influent TSS and BOD

profile

Sedgwick (Kan.) Wastewater Treatment Plant

BUILT:	1982
LAST UPGRADE:	2006
OPERATOR:	Richard Ludowese
FLOWS:	0.292 mgd design, 0.080 mgd average, 0.140 mgd peak
TREATMENT PROCESS:	Oxidation ditch
TREATMENT LEVEL:	Secondary
RECEIVING WATER:	Sand Creek
BIOSOLIDS:	Incorporated and land-applied

"We are constantly looking for better ways to control our process and improve plant performance. With recent upgrades, regular maintenance and a quest for continual learning, today our plant looks like a state-of-the-art facility, not a 'sewer plant.'"

JACI REIMER

was causing the 27-year-old plant to exceed discharge standards occasionally.

In fact, during a five-year period, it failed to meet the standards 21 times. The trouble was eventually traced to a nearby industry that was discharging vegetable oil into the sewer, leading to influent TSS over 500 ppm and BOD from 2,000 to 20,000 ppm. In 2006, the city wrote a new ordinance for industries discharging to the sewer, but the offending company could not meet the new standards and was disconnected.

Even with the high-strength influent, the Sedgwick plant met its permit requirements most of the time, and in the past three years, it has consistently met or exceeded them. Reimer and Ludowese attribute that to equipment upgrades, along with Ludowese's status as a full-time operator and his willingness to go the extra mile.

"When I took over as plant operator in 2004, we realized we needed to make some improvements to the plant," says Ludowese. "We replaced the automatic rotor blades, which were 25 years old. Some of them were falling out due to wear, and some had even broken."

The plant also replaced the weir and installed automatic DO meters in the ditch, both on the south and north sides, about 30 feet behind the

Sedgwick Wastewater Treatment Plant
REQUIREMENTS AND PERFORMANCE

PARAMETER	INFLUENT	PERMIT	ACTUAL
BOD (mg/l)	250-450 mg/l	30 mg/l	ND (5 mg/l)
TSS (mg/l)	100-200 mg/l	30 mg/l	ND (5 mg/l)
pH	7.3-7.6	6.0 - 9.0	7.3-7.6
Ammonia	40-60 mg/l as N	10.2 mg/l	0.10-5.0 mg/l
Fecal Coliform	–	200/100 ml	5/100 ml
E. coli	–	160/100 ml	ND (1/100 ml)

ND = Not Detected

A sample shows the clarity of effluent from the Sedgwick plant.

rotors. The old weir was made of wood and had to be manually lifted up and down to control the level of the ditch. The new fixed aluminum weir is at a set height determined by the plant engineers.

FOR THE FUTURE

The plant also upgraded to variable-speed automatic drives controlled by feedback from the DO meters in the ditch. Before this improvement, plant personnel had only two rotor speeds — fast or slow. Now, each rotor independently speeds up or slows down to maintain a more favorable DO level and deliver more control over algae.

The plant also installed a SCADA system to make critical process readings available in real time around the clock and to automatically log data into the computer.

"These changes were mostly to control our process due to the issues we had been having with the industrial discharges, and to improve the plant for the future," Reimer says.

While upgrading the equipment, Ludowese and his team also decided to install railings, paint the steps and make sure everything was properly marked for safety. Those improvements were made "just because it was a good idea and the right thing to do," Reimer observes.

Besides Ludowese's 40 hours per week, the plant benefits from two part-time operators who rotate on weekends. Ludowese is adamant about continuing his education by taking classes and sharing best practices with other operators. He makes sure he keeps his part-time operators up to speed, running through plant operations every six months and pointing out any changes that have been made.

"Richard took a whole different approach than our previous operators," notes Reimer. "He took the time to find out why things didn't work. We could have done everything we did with a different operator, and it wouldn't have had the best results."

MOST IMPROVED PLANT

His efforts paid off. In 2007, the plant was awarded the Kansas Water Environment Association (KWEA) award for the most improved plant in the small plant category. The plant was also nominated for the award in 2008.

"Since we won that award, the city council members come out every year to tour the plant," Reimer says. Adds Ludowese, "The technical school where I studied to become a Class IV operator brings students by to see the plant, and city engineers bring operators from other treatment plants that have had similar problems to ours so we can share information."

In spring of 2006, the plant received a Kansas Department of Health & Environment (KDHE) grant to participate in a biological nutrient removal program. By then, the plant had been making progress and has started passing state exams regularly. KDHE determined that Sedgwick was ideal for the program.

The Sedgwick treatment plant is small, but city officials and plant staff constantly explore measures to enhance its performance.

"Our almost 30-year-old plant wasn't designed to do micronutrient removal," says Ludowese. "But with this program, we will be able to reduce phosphorus and ammonia, and will be able to reduce nitrogen in the future to meet increasingly stringent permit specifications."

KDHE developed the Nutrient Reduction Plan to reduce nutrients, mitigate eutrophication, and allow long-term improvements in water quality. The Sedgwick plant can now do micronutrient testing in-house as part of its monitoring for chlorides, dissolved oxygen, total phosphorus, Kjeldahl nitrogen, nitrate, nitrite and total nitrogen.

Reimer and Ludowese are quick to acknowledge help from others along the way, from the city's $900,000 investment in the plant over the years, to the city's engineers, and to Jerry Grant, a retired KDHE employee who monitors the grant funds that help treatment plants experiment with biological nutrient removal.

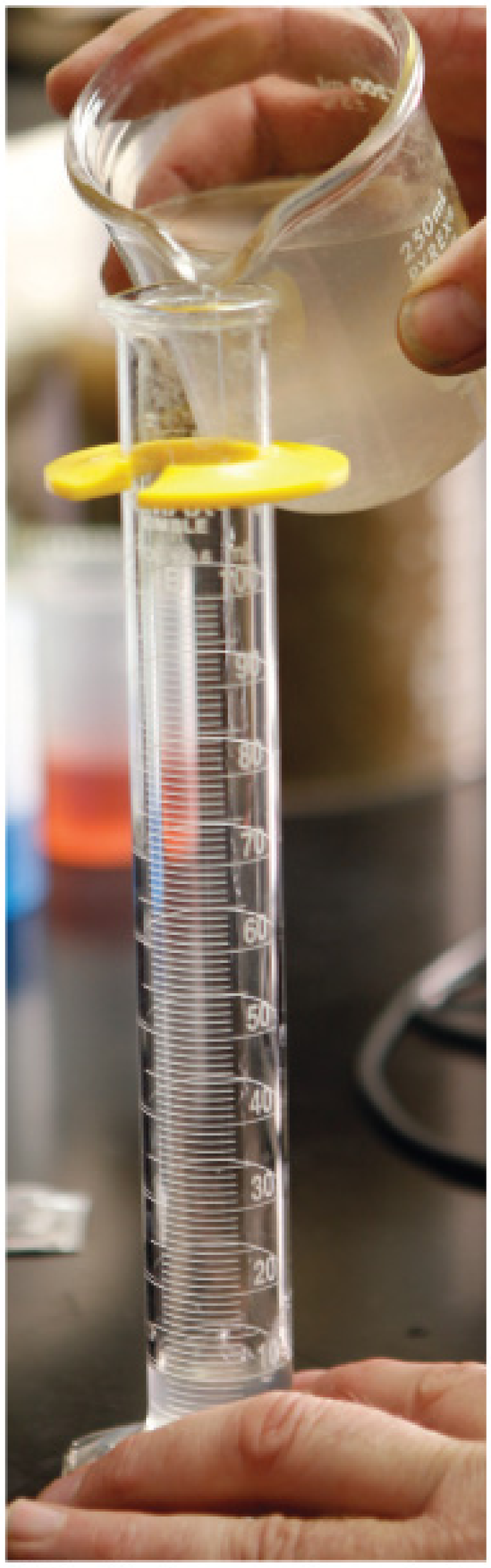
When the Sedgwick plant received the grant, Reimer and Ludowese

INSIDE THE SEDGWICK PLANT

The City of Sedgwick Wastewater Treatment Plant consists of a pump station, comminutor, oxidation ditch, final clarifiers, ultraviolet disinfection, an effluent polishing lagoon, an aerated sludge storage tank, and liquid biosolids handling. The main lift station is located a mile south of the plant.

Influent is sent to the headworks and transported via Archimedes screw out into the oxidation ditch. The waste activated sludge is sent back to the low-oxygen zone. There is a high oxygen rate through the rotors, over the weirs and out the clarifiers. The clarifier effluent is UV disinfected and sent to the polishing lagoon. The return activated sludge is sent back to the oxidation ditch.

The plant discharges to the Little Arkansas River via Sand Creek and the Little Arkansas River Basin.



Richard Ludowese performs simple daily tests to make sure the plant is performing as it should.

Plant performance has improved significantly since Ludowese came on board as operator in 2004.

decided they needed some better testing equipment to perform daily and sometimes twice-daily tests for ammonia and pH so that they could better maintain an anoxic zone for nutrient removal. They purchased a pH meter and ammonia tester, and also a TSS meter so they could monitor mixed liquor solids.

They began testing the three lift stations daily to determine the TSS, ammonia and pH levels before the influent reached the plant. This helped plant operators figure out where the treatment load was coming from and at what times spikes were occurring. It also allowed them to handle the situation without having to wait for lab results. The plant also replaced its antiquated DO meter with an LDO meter, which allows plant personnel to double-check the automatic system's operation.

LOOKING TO THE FUTURE

Ludowese looks forward to taking plant operations to the next step, meeting future challenges like micronutrient removal. "The state rewrites the specs every three years, so we don't know how much tighter they will be next time around or whether we will be required to remove nitrate or phosphate," he says.

The city is developing another industrial park, and Ludowese is looking at the ramifications for the treatment plant. Sedgwick's population is growing at about 3 percent per year. And, while Reimer would like to attract more industry to the area, she plans to be more careful this time.

"Back when we started to promote the city to industries, we weren't quite prepared for the resulting waste, and we forgot about what it would do to the sewer," she says. "We need to be more diligent, and ideally we would

Ludowese takes a Secchi disc reading for water clarity.

like to attract smaller-volume businesses." Today, there are 12 industries in the city, but its closeness to Wichita and its location on a major highway and near a railway line make it ripe for industrial growth.

The plant is in a good position to deal with population increases, since it operates at only 50 percent of capacity and can be easily upgraded by adding another oxidation ditch and UV disinfection bays, as well as pretreatment for nutrient removal.

ALWAYS LEARNING

Other challenges remain, such as preparing to rebuild the main lift station and perhaps adding another sludge storage tank. To Ludowese, the biggest challenge for the future is simply learning. "After five years I'm still an amateur," he says. "My success will depend on better process control. It's a big job for one person, and some days I wonder if I can get it all done. But I set a schedule and keep picking away at it."

Besides a Class IV certification in plant operations, Ludowese has a Class IV in water treatment and is working toward his Class IV in distribution. He takes advantage of other resources to continue his education, including conferences sponsored by KWEA and the Kansas Rural Water Association.

Reimer, who went to school to become a Class II wastewater treatment plant operator so she could understand the process better, agrees with his approach, although she thinks Ludowese is being too humble about his success. "Without an operator like Richard who went the extra mile and maintained everything so we could get full life from our equipment, we would have had to rebuild the plant," she says. "As it stands now, it's good for another 20 years." **tpo**

top performer: **BIOSOLIDS**

THE EVERETT (WASH.) WATER POLLUTION CONTROL FACILITY MOVES BIOSOLIDS EVERY TWO YEARS, BUT THE MANAGEMENT PROCESS REMAINS A YEAR-ROUND CONCERN WITH A SHARP EYE ON THE FUTURE

By Diane Gow McDilda

Hands-on *Contracting*

Gulls and other wildlife flock to the aeration cells at the Everett (Wash) Water Pollution Control Facility. (Photography by Kevin Nortz)

FROM A DAY TO DAY PERSPECTIVE, BIOSOLIDS MANAGEMENT AT THE EVERETT WATER POLLUTION Control Facility (EWPCF) in northwest Washington is relatively low key. But every two years, it's an intensive effort that includes a survey and measurement of solids, preparation of bid packages, and oversight of multiple contractors headed out in different directions with the plant's Class B biosolids cake.

"We'll have one contract for dredging and dewatering, and maybe two or three contracts or professional service agreements for transportation and application," says Chris Chesson, biosolids specialist with the City of Everett Public Works Department.

The process starts four to five months before the biosolids handling begins. "For the last dredging and dewatering, we started in February 2008, and the contractor was onsite the first of July," says Chesson. The schedule gives him time to evaluate site conditions, determine the material volume and percent solids, and review available land and application methods.

Chesson stays on top of biosolids management year-round, always making sure the material will have a home in some form of beneficial reuse. He also looks ahead with newer approaches, which soon may include creation of Class A compost.

SOLID IMPROVEMENTS

The Everett treatment plant, built in the 1960s, originally included an oxidation pond with an outfall to the Snohomish River. In 1971, aeration ponds were added upstream of the oxidation pond, and a chlorine contact channel downstream.

The aeration ponds are two 15-acre cells that operate in series. These are followed by a 130-acre oxidation pond, a 30-acre polishing pond, and the chlorine contact channel. The aeration cells are separated from the rest of the lagoon system by a public access road leading to nearby Spencer Island Park.

profile

Everett Water Pollution Control Facility, Everett, Wash.

BUILT:	1960
TREATMENT LEVEL:	Secondary
TREATMENT PROCESS:	Lagoons/trickling filter-solids contact
FLOWS:	Design 36.3 mgd, average 20 mgd, peak 100 mgd
RECEIVING WATER:	Snohomish River
BIOSOLIDS PROCESS:	Extended digestion in one aeration cell
BIOSOLIDS VOLUME:	4,000 dry tons/year
BIOSOLIDS USE:	Land application of Class B cake
WEB SITE:	www.everettwa.org

LEFT PHOTO: Water quality analyst Tim Rickman weighs wastewater solids collected on clarifier filters to determine TSS at different stages of clarification. ABOVE: The view east from the primary clarifier shows the secondary clarifiers, in the foreground, and two trickling filters.

A trickling filter/solids contact (TF/SC) process was built in 1991 and is referred to as the mechanical system. It operates in parallel with the aeration ponds (lagoon system) and includes two secondary clarifiers and a chlorine contact chamber.

The final site modifications came in 2006 when two primary clarifiers were added in an effort — successful so far — to address odor problems. Residents living across the river haven't voiced any objections. "You can stand right next to the pad and not detect a high ammonia smell," says Chesson. "It's earthy, but not as pungent as others."

Also added in 2006 was a biosolids handling area measuring about three acres, two-thirds of it paved. This elevated area, in the southeast corner of the oxidation pond, is used to treat and stockpile solids removed from the lagoon system.

Plant influent generally receives primary treatment through the bar screen, grit collectors, primary sedimentation tank, and biofilter. After that, it is directed to either the mechanical system or lagoon system for secondary treatment. The method of secondary treatment is based on various factors including influent volume and organic content.

At present, all primary clarifier effluent flows to the first aeration cell, then to the TF/SC. To maintain pond levels and make use of their discharge location, effluent from the secondary mechanical system is pumped back to the lagoon system.

Everett WPCF team members: from left, Deanna Schuler, office manager; Chris Merwede, lab manager; John McCllellan, operations superintendent; Jeff Wright, process analyst; Peter Berger, project manager; and John Smit, maintenance superintendent.

The lagoons also manage solids from the mechanical system. Mixed liquor is concentrated in the secondary clarifier and discharged to the aeration cell. When flow to the mechanical system is 16 mgd, about 15,000 pounds of secondary solids is sent to aeration.

DREDGING UP SOLIDS

Every two years, solids in the second aeration pond are dredged, dewatered, and distributed. Even though Chesson has been through the process many times, he still makes sure everything in the bid package is up to date.

"We do a hydrographic survey of the pond bed before going out for bid," he says. "We'll then be able to say, for example, that we have about 4,000 dry tons of biosolids at 8 percent solids. We provide a lot of information to potential bidders. And there's a pre-bid walk-through."

Because of a legal challenge, walk-throughs are no longer mandatory, but the specifications strongly encourage bidders to make a physical inspection of the property. "They have the bid documents, and they can ask questions," Chesson says. "We can answer all their questions, and if we have to follow up on one, we can post a written addendum before they submit their packages."

Bid invitations are sent to contractors Chesson knows can do the work. Advertisements are sent to industry publications and to the Northwest Biosolids Management Association (NBMA), a regional nonprofit organization for biosolids professionals, on whose board Chesson serves as secretary.

> "We do a hydrographic survey of the pond bed before going out for bid. We'll then be able to say, for example, that we have about 4,000 dry tons of biosolids at 8 percent solids. We provide a lot of information to potential bidders. And there's a pre-bid walk-through."
>
> **CHRIS CHESSON**

The organization is familiar with contractors Chesson may not know, and contractors keep in touch with the NBMA to expand their client base.

Chesson prepares the bid packages, assisted by staff in the city clerk's office, which distributes the packages, accepts the bids, and checks contractor bonds. When it comes to dredging and dewatering the biosolids, Chesson lets the contractors decide on the best methods. The specifications require contractors to meet a minimum solids content.

"We let them propose a dewatering method, but in our experience, centrifuges work better than belt presses," he says." We used high-speed centrifuges in the last three or four dredging cycles. I haven't had anyone bid a belt filter press. We always specify 28 percent solids because we know it will be fairly easy to manage. It stacks up pretty well and doesn't have a lot of free liquid."

In 2008, the biosolids were removed from the aeration pond using a cutterhead dredge that passed back and forth across the lagoon. The rotating cutter apparatus, surrounding the intake end of the suction pipe, excavated six feet into the solids. The suctioned material was pumped to the handling area, where American Process Group had set up two model HDC 970 centrifuges, modified to meet the needs of large-scale dredging. Praestol 855 BS (Ashland Water Technologies), a white granular polymer, was added to the biosolids to facilitate dewatering.

Dredging and dewatering took 30 days to complete with the contractor working 24 hours a day, six days a week. The result was more than 4,000 dry tons of biosolids, stockpiled on site and ready for transport.

GETTING A MOVE ON

Separate contractors handle transportation and application of the biosolids, but the work is scheduled concurrently. Haulers use sealed, covered, and watertight trailers. Chesson knows the routes and ensures that contractors clean up any spills.

The application contractor is responsible for disposing of the biosolids, and specifications require them to be applied within 10 days of delivery to a site. The city uses four types of land application sites, each with its own nuance, its own method of application, and its own permit requirements:

Silviculture. Material is applied to city-owned land used as a poplar plantation, and to other sites that grow Douglas fir and cedar. Here, the contractor must have equipment to project the solids 80 to 120 feet between the trees. Once dispersed, the biosolids are not incorporated into the soil, but slowly break down at the surface.

Cropland. Large volumes are applied to private land used to grow crops and raise dairy cattle. The material is tilled into the soil.

Wheat fields. Wheat farms in King County in eastern Washington accept

Plant operator Chris Chesson stands atop the trickling filters looking west toward the primary clarifiers and the administration and laboratory buildings.

STEPPING UP IN CLASS

Chris Chesson never stops looking for beneficial uses for biosolids from the Everett Water Pollution Control Facility. One method he sees that has potential to scale up is creating Class A biosolids through composting.

"We will be implementing a small-scale aerated static pile composting operation this year to produce about 500 cubic yards of Class A compost for use on various city projects, landscaping or reclamation, or distribution to the public," says Chesson. "Right now, we're looking at mixing biosolids with yard waste, and seeing what else is available and cost effective."

The city expected to have yard waste received and piles built by fall 2009. If all goes well, the plan will create a permanent process, using a percentage of biosolids to build a continuous supply of compost.

EVERETT WATER POLLUTION CONTROL FACILITY
PERMIT REQUIREMENTS

LAGOON OUTFALL

$CBOD_5$	25 mg/l monthly avg. 40 mg/l weekly avg.
TSS	60 mg/l monthly avg. 90 mg/l weekly avg.
Fecal coliform	200/100ml monthly avg. 400/100ml weekly avg.
pH	6.0 - 9.0
Total Residual Chlorine	0.016 mg/l monthly avg. 0.083 mg/l max. daily

TRICKLING FILTER/SOLIDS CONTACT OUTFALL

$CBOD_5$	25 mg/l monthly avg. 40 mg/l weekly avg.
TSS	30 mg/l monthly avg. 45 mg/l weekly avg.
Fecal coliform	200/100ml monthly avg. 400/100ml weekly avg.
pH	6.0 - 9.0
Total Residual Chlorine	0.020 mg/l monthly avg. 0.095 mg/l max. daily

Plant operator Mark Hatzenbuehler takes a one-liter water sample at each pump station, aeration cell, and stage, and verifies the temperature, pH, and DO in the final effluent.

"I'll talk to farmers or others at conferences. We'll meet on site and I'll ask what crops are grown. If they're prepared to accept our quantity and quality, then I prepare the site-specific land application plan. The plans are involved. We have a template, but each one is site-specific."

CHRIS CHESSON

biosolids from Everett and other municipalities on what Chesson refers to as a good will basis, meaning the material disposal is free and the city covers transportation costs. Travel through the mountains to these sites is expensive, so the city seldom uses this option.

Municipal projects. Recently, the Snohomish Public Utility District used the biosolids as part of a hydroelectric pipeline construction and land reclamation project. Everett hauled and stockpiled biosolids along the four miles of backfilled trench. Workers then spread the material with a bulldozer and seeded the area.

PLANNING AND PAPERWORK

The state encourages land application of biosolids as beneficial recycling. Administered by the Department of Ecology, the permitting process includes identifying land to receive biosolids to state and local governments. A state coordinator also visits the site. After any concerns are addressed, a report is submitted to the U.S. EPA, the state, and the county health department. The public is notified and allowed to comment before a "determination of non-significance" is issued.

"I'll talk to farmers or others at conferences," says Chesson. "We'll meet on site and I'll ask what crops are grown. If they're prepared to accept our quantity and quality, then I prepare the site-specific land application plan. The plans are involved. We have a template, but each one is site-specific."

Chesson keeps multiple sites in the queue as fields go fallow. Like many biosolids professionals, he tries to plan as far as five and 10 years ahead. For Chesson and other professionals at the Everett treatment plant, biosolids management involves equal parts of paperwork and hands-on skill, with eyes to the future. **tpo**

more info:

American Process Group
866/960-1480
www.amprocessgroup.com

Ashland Water Technologies
www.ashland-water.com

industry news

Industrial Scientific Appoints Schultz General Manager

Industrial Scientific has named Griffin Schultz general manager for its sister company Design, Build, Own & Operate Inc. He will manage the company's sales and implementation functions, drive product management, software development and marketing initiatives.


Griffin Schultz

Pat's Pump Named Florida Allianz Sweeper Dealer

Pat's Pump & Blower LLC has been named Florida dealer for Allianz Sweeper Co./Madvac Inc., producer of mechanical and vacuum litter collection equipment.

Adaptive Instruments Forms Marketing Partnership

Adaptive Instruments Corp. has formed a marketing partnership with Adaptive Wireless Solutions and Control Microsystems. Adaptive Wireless is licensed to use Accutech-enabled technology for OEM customers, and has acquired the production facilities and rights to the AIC traditional product line. Control Microsystems will be responsible for development, manufacturing and sales of the Accutech wireless products through a dedicated division of the company.

Thompson Pump Moves into Panama City Facility

Thompson Pump & Manufacturing Co. Inc. has moved its Panama City branch to a new 6,200-square-foot facility on 1.5 acres. The building houses pump rentals, sales, parts and service.

Neptune Earns CE Certification in European Markets

Neptune Chemical Pump Co. Inc. has earned CE certification in Europe for its chemical metering pumps and mixers. CE certification is mandatory for machinery and low-voltage equipment sold within the 27 countries of the European Union, the European Economic Area, and the European Free Trade Area.

Science Applications Acquires R.W. Beck

Science Applications International Corp. has acquired R.W. Beck Group Inc., provider of business and technical consulting services in engineering, energy and infrastructure in the wastewater industry. Beck joins SAIC's Infrastructure, Logistics and Product Solutions Group led by President Joe Craver.

General Monitors Receives IEC Certification

General Monitors' gas and flame detectors have received IEC 61508 certification from FM Approvals.

Noren Products Launches New Web Site

Noren Products has launched a new Web site, www.norenproducts.com. The site features product images and an updated contact page. **tpo**

FAITHFUL SERVANT

AFTER 33 YEARS IN WATER AND WASTEWATER TREATMENT, ROBERT LOVETT STILL LOOKS FORWARD TO WORKING EACH DAY FOR HIS HOME CITY AND FOR OTHER COMMUNITIES ON CONTRACT

By Ted J. Rulseh

AS A YOUNG MAN IN THE U.S. NAVY, ROBERT LOVETT RAN A PAIR OF triple-effect evaporators that turned seawater into fresh water for the crew of the aircraft carrier *USS Saratoga*. He couldn't have known then that water would become his career.

Lovett, now 70, has worked in water and wastewater treatment for 33 years and has no plans to slow down. His main job is to operate the water and wastewater treatment plants in Woodbury, Ga., a community of 1,200, about 60 miles south of Atlanta. He also serves as contract operator for treatment systems in the nearby towns of Warm Springs (population 400), Concord (200), Talbotton (500) and Greenville (1,000).

There is no question he has followed his calling. "Somebody told me a long time ago to find something you really, really like to do, then get somebody to pay you to do it," he says. "And that's what I've done. I can honestly say that in all my years in water and wastewater, I've never got up a single morning dreading to go to work. I've enjoyed every day, and I work seven days a week."

Lovett enjoys serving the public as well as giving back to the profession through activity in the Georgia Rural Water Association and service on the board of directors of the Meriwether County Water Authority.

Robert Lovett, shown in the 45-acre coastal Bermuda grass spray field that serves the Woodbury treatment plant, has developed a passion for his profession and for serving his home community. (Photography by Matt Hanner.)

CHANGE FOR THE BETTER

Lovett joined the Navy in 1958, straight out of high school in Woodbury, and attained the rank of petty officer second class. He left after his four-year hitch and went to work for a business form printing company back home.

After 14 years, he was tired of that. His wife Sylvia, then city clerk in Woodbury, heard that the mayor needed someone to run the water treatment plant and let her husband know. "So I switched over, and it's the best thing I've ever done," says Lovett.

He took training through the Georgia Water & Pollution Control Association (now called the Georgia Association of Water Professionals) and soon was operating the water and wastewater treatment plants. Today, he holds Georgia Class 3 wastewater and Class 2 water certifications.

About 20 years ago, he started doing contract work for other communities. Perhaps his most interesting assignment is operating the new sequencing batch reactor (SBR) plant in Warm Springs, site of the Roosevelt Warm Springs Institute and former President Franklin Roosevelt's Little White House (see sidebar).

The Warm Springs treatment system was built in 1950 and later deeded to the city. Lovett began operating the old activated sludge facility 17 years ago. "We met our permit, but the plant was aging," he says.

In 2006, the new $5 million SBR plant (Aqua-Aerobic Systems Inc.) went on line, serving the city and as many as 200,000 visitors to the Roosevelt historic sites each year. The plant, designed for 400,000 gpd, treats 200,000 gpd on average.

CONSISTENT PERFORMANCE

Influent passes through a bar screen, then drops into a lift station, from which three Flygt pumps lift it to the two SBRs. Treated effluent decants to an equalization basin, flows through UV disinfection, and into Cold Creek.

After decant, biosolids are pumped to an aerobic digester, and from there to a drying bed (F.D. Deskins Company Inc.). "It's the only drying bed

"Somebody told me a long time ago to find something you really, really like to do, then get somebody to pay you to do it. And that's what I've done."

ROBERT LOVETT

Lovett shares his time among five wastewater treatment plants, four of which he operates on a contract basis.

profile

Robert Lovett, City of Woodbury, Ga.

POSITION:	Wastewater and water operator
EXPERIENCE:	33 years
RESPONSIBILITIES:	Employed by City of Woodbury; contract operator for Warm Springs and three other communities
CERTIFICATIONS:	Georgia Class 3 wastewater and Class 2 water
AWARDS:	Outstanding Plant Award, water plants under 1 mgd, 1980 and 1986, Georgia Water & Pollution Control Association
GOALS:	Continue working until age 90

of its kind in Georgia," says Lovett. "Instead of sand, it uses crushed gravel on top. With sand, the material takes a month to dry. With this system, in good weather, it dries in five or six days. After that, we rake it up and take it to the landfill." Water from the drying bed underdrain is piped back to the plant headworks.

Plant influent averages 180 mg/l BOD and 140 mg/l TSS. The NPDES permit calls for 17 mg/l BOD and TSS in September, October and November and 30 mg/l for the rest of the year. Actual effluent BOD and TSS are below 5 mg/l. "It looks like drinking water," Lovett says. "Ammonia is below the detection limit. Our pH limit is 6 to 9, and that runs about 7.2. The dissolved oxygen limit is 5 parts per million, and that runs better than 7. We've never failed to meet our permit."

Lovett made his own contribution to the plant's design, calling for the addition of DO probes in a feedback loop to optimize blower operation in the SBRs and save energy. "I read about that in a magazine at the time we were building the system," he says.

"Most plants run the blowers on a timed basis to keep the DO level up. We control the blowers with the DO probes. We keep the DO in a range from 1.2 to 2.5 parts per million. The blowers come on at 1.2 and cut off at 2.5. We spent about $11,000 for that system with a change order, but it was well worth the money."

The SBR process is fully automated, and a SCADA system enables Lovett to monitor the operation from Woodbury.

KEEPING TABS

Meanwhile, Lovett watches over the Woodbury treatment facilities, with help from one full-time operator, Ray Grizzard. The water treatment plant, a 40-year-old coagulation, sedimentation, filtration and chlorination system, is permitted for 750,000 and produces about 200,000 gpd.

The wastewater plant is rated at 325,000 gpd and processes about half that amount. The influent enters a four-acre oxidation pond and from there flows to a 9-million-gallon holding pond. It is then pumped about one mile to a spray field of six spray areas equipped with fixed heads.

"We raise 44 acres of coastal Bermuda grass," says Lovett. "I used to bale about 10,000 bales of hay per year. Then it reached the point where we couldn't get the help we needed, so we bid that out. Three Trees Farm in Woodbury handles that now, and they round-roll it. They get four or five cuttings of some pretty good hay." The facility's permit calls for 50 mg/l TSS and 30 mg/l BOD. Chlorination is not required; a buffer strip and chain link fencing restrict public access to the spray fields.

Lovett started work life in the printing industry but found his true calling when he moved into water and wastewater treatment. Here, he tests for alkalinity at the water plant in Woodbury.

"Georgia Rural Water is one of the best organizations we have in the state. They do video inspection and smoke testing of sewer lines, leak detection, troubleshooting, and other services for us. They also do all the training classes for water and wastewater operators."

ROBERT LOVETT

PHOTO COURTESY OF SBLEVIEPRODUCTIONS

Aerial view of the Warm Springs treatment plant.

The other treatment facilities that Lovett runs on contract are simple lagoon systems. He handles the testing, sending samples to a private laboratory. City public works employees provide maintenance support.

GIVING BACK

The diverse responsibilities don't bother Lovett — in fact, he thrives on them. "I go to work every morning at four o'clock, and I work until it's done," he says. "I just enjoy it. It's been my life." In his spare time, Lovett attends meetings of the National Rural Water Association — 16 of them so far, all around the country. He was a founding board member of the Georgia Rural Water Association and has served as treasurer, vice president, and president.

"Georgia Rural Water is one of the best organizations we have in the state," Lovett says. "Their executive director, Jimmy Mathews, has done more for water and wastewater than anyone I know. They do video inspection and smoke testing of sewer lines, leak detection, troubleshooting, and other services for us. They also do all the training classes for water and wastewater operators."

As a board member with the Meriwether County Water Authority, Lovett is helping to oversee design and construction of a new $17 million wastewater treatment plant to serve a booming area in the northern part of the county. A new Kia automotive plant in West Point is expected to employ, with all its satellite suppliers, about 6,000 people, and other major businesses are moving to a new industrial park. "I'm the only person on the board who has any experience in water and wastewater," Lovett says.

THE LITTLE WHITE HOUSE

The biggest customer of the Warm Springs Wastewater Treatment Plant, which Robert Lovett operates, is the Roosevelt Warm Springs Institute for Rehabilitation.

This state-operated rehabilitation center sits on a scenic 950-acre campus. Started by Franklin D. Roosevelt in 1927 to treat persons afflicted by polio, the institute remains true to its mission "to empower individuals with disabilities to achieve personal independence" as a living legacy to FDR.

Each year, the institute serves about 5,000 people with all types of disabilities from throughout the United States. It also offers the Camp Dream, enjoyed by 2,000 disabled campers each year, and a year-round conference center that provides a full array of professional training.

Warm Springs is also home to Roosevelt's Little White House Historic Site, a Georgia state park. FDR built the house in 1932 while governor of New York, before he was inaugurated as president in 1933.

He first came to Warm Springs in 1924, hoping to find a cure for the polio that had struck him in 1921. Swimming in the area's warm spring waters brought him no miracle cure, but it did bring improvement. During his presidency and through the Great Depression, FDR developed many New Deal Programs based on his experiences in Warm Springs.

On April 12, 1945, while posing for a portrait in the Little White House, Roosevelt suffered a stroke. He died a short while later.

Lovett sees a bright future for young people in wastewater treatment, which he says offers rewarding employment with little risk of layoffs when the economy turns downward.

SERVING THE PUBLIC

Meanwhile, Lovett takes quiet pride in his daily work. He enjoys good relationships with the government leaders of the cities he serves and feels they listen to and respect his professional opinions.

"It's a public service that goes unnoticed," he says. "The firemen and policemen and others get all the credit. We don't get too much credit out here pumping the water. I just enjoy working with the public. We're public servants. We should never forget that."

He expresses gratitude to people who have helped him over the years. Among them is Jerry Hood, vice president of Engineering Management Inc. in Lawrenceville, Ga. "He is a great friend who will go the extra mile to give you a helping hand," Lovett says. "I am also indebted to Bobby Brown, the mayor of Woodbury who hired me 33 years ago. He did a great deal for this community and for me. He's the one who gave me a chance in life."

"I've always said that if you can run a small system, you can run any system, because you do everything — the janitorial work, cutting the grass, treatment, lab work. You do it all."

ROBERT LOVETT

To Lovett, every day is interesting. "When you come in, you don't know what you're going to face," he says. "I love the challenges. It keeps you young. In a small town, you do it all. I've always said that if you can run a small system, you can run any system, because you do everything — the janitorial work, cutting the grass, treatment, lab work. You do it all."

Lovett often gives treatment plant tours to school groups and civic organizations."When they flush the commode at home, they don't realize where it goes and what happens to it," he says. "When they come out and see it, they're amazed at what we do."

He sees a bright future in the treatment sector for young people looking for rewarding and permanent employment. In a time when companies are downsizing and sending jobs overseas, wastewater treatment offers security. "We might not get rich doing it, but we'll always have a job," he says. "The people who were making $30 or $40 an hour in the auto industry were a lot better off than I was during that period. But since that industry has shut down some plants, I consider myself blessed to be still on the job, supplying people with water."

Lovett's job helped him raise three daughters, the eldest a labor and delivery nurse, the middle one a teacher, and the youngest a surgical nurse. His wife of 44 years recently retired from her job as deputy clerk of Superior Court in Meriwether County, but retirement is not in his plans: "I'm 70 years old, and I want to work to about 90." tpo

more info:

Aqua-Aerobic Systems Inc.
815/654-2501
www.aqua-aerobic.com

F.D. Deskins Company Inc.
765/724-7878
www.deskinsinternational.com

ITT Water & Wastewater U.S.A. – Flygt Products
203/380-4700
www.us.ittwww.com

Caring Works

THE LOWELL (MASS.) REGIONAL WASTEWATER UTILITY REDUCES ENERGY USAGE MORE THAN 30 PERCENT WITH THE RIGHT ATTITUDE AND A HOST OF PLANT UPGRADES

By Mike Grennier

Among many energy-efficiency improvements at the Lowell treatment plant, mechanical surface aerators were replaced with a rubber-membrane fine-bubble diffused air system from Sanitaire Products.

Being green is about many things for the City of Lowell (Mass.) Regional Wastewater Utility (LRWWU), but it's mostly about caring. "People who work at treatment plants must be aware of our impact on the environment," says executive director Mark Young. "It's everything we do in our jobs."

It's an attitude that works for this 32 mgd activated sludge plant, which began focusing intently on energy and environmental initiatives in 1996, when Young took his current position. Since then, energy consumption at this ISO 14001-certified operation dropped from 10 million MWh in 1996 to less than 6.7 million MWh — all the while processing 6 mgd more water than 13 years ago.

Years of effort save ratepayers some $400,000 per year. Additionally, the utility recently scored 90 out of 100 on a U.S. EPA ENERGY STAR program that evaluates treatment plant efficiency in energy use and wastewater flow. That compares with an average score of 55 nationwide.

> "In the days when energy was cheap, people didn't feel it was important. That's a bad philosophy. From a cost and environmental standpoint, you should care whether energy is cheap or not."
>
> **MARK YOUNG**

"In the days when energy was cheap, people didn't feel it was important," says Young. "That's a bad philosophy. From a cost and environmental standpoint, you should care whether energy is cheap or not."

EMPLOYEE IDEAS

Lowell's approach begins with employee-generated ideas, a concept that coincides with the ISO 14001 environmental management program. "The reality is that when you get to large capital improvements, you're going to see reductions in energy use," says Young. "But it's very important to first involve employees in anything that affects the environment, and to get everyone thinking along the same lines."

What's Your Story?

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

Employee involvement led to a host of improvements, such as the use of fluorescent energy-efficient lights and motion sensors that save about $20,000 each year. Another employee idea was to rotate pumps on and off during dry weather to deliver water from six clarifiers to the grit removal system. By not running all pumps continuously, the plant saves as much as $12,000 per year.

SAVING WITH UPGRADES

While operational measures have always been key, Lowell also looks to equipment upgrades to improve efficiency and save energy. "We're fortunate to have the backing of the city manager and city council in moving forward with upgrade projects," says Young. Projects completed since the late-1990s include:

Aeration system improvements. Mechanical surface aerators were replaced with a Sanitaire rubber membrane fine-bubble diffused air system. The upgrade also included Roots energy-efficient blowers and a new SCADA system for better control.

Pump upgrades. Older influent, return activated sludge (RAS) and waste activated sludge (WAS) pumps were replaced with Fairbanks-Morse high-efficiency pumps and U.S. Electrical motors (Emerson Motor Company) with variable-frequency drives.

Heating conversion. Natural gas replaced electric heaters to heat 12 pumping stations that feed the plant. The local gas utility helped fund the conversion. Lowell also converted from electricity to gas to heat domestic water throughout the treatment plant.

Replacing motors. Old motors that were sent out for rewinding were replaced with GE high-efficiency motors.

Whether it's a major upgrade on an aeration system or regular motor replacement, Young says it all adds up. "It's not just one or

"It's not just one or two things. And it's not just big projects. It's the little projects and the big projects that come together to produce results."

MARK YOUNG

two things," he says. "And it's not just big projects. It's the little projects and the big projects that come together to produce results."

A HIGHER LEVEL

With the help of a consultant, the utility identified other initiatives to reduce energy usage and the plant's environmental footprint. Projects range from automatic setback controls that reduce heating levels on a more consistent basis, to electric sub-meters that provide real-time energy use data.

New technologies also are in store. One initiative is to replace centrifugal blowers on the aeration system with high-speed turbo blowers that promise to increase efficiency and minimize maintenance. Another plan is to use roof-mounted solar panels to generate electricity on site and to install wall-mounted solar-heating systems to heat process buildings in winter.

The plant also will install green roofs on five major buildings. A green roof includes a waterproofing and root-repellent system, drainage system, filter cloth, lightweight growing medium, and plants. The roofs are expected to save on heating and cooling costs and reduce stormwater runoff.

The green roof is Young's idea. "People in my position are more than just department heads," he says. "Among other things, we are financial officers, energy managers, physiologists, and environmentalists." tpo

Older influent, return activated sludge (RAS) and waste activated sludge (WAS) pumps were replaced with Fairbanks-Morse high-efficiency pumps and U.S. Electrical motors (Emerson Motor Company) with variable-frequency drives.

Old motors were replaced with GE high-efficiency motors. Energy-efficient Roots blowers were deployed for the aeration system.

more info:

Dresser Roots
(765) 827-9200
www.dresserroots.com

Fairbanks Morse
800/356-6955
www.fairbanksmorse.com

Emerson Motor Company
888/637-7333
www.usmotors.com

ITT Water & Wastewater – Sanitaire
414/365-2200
www.sanitaire.com

Put Water to Work?

A NEW JERSEY OPERATOR SEES SIGNIFICANT ENERGY-SAVING POTENTIAL IN HYDRO TURBINES TO CAPTURE THE ENERGY OF FLOWING INFLUENT AND EFFLUENT

By Ted J. Rulseh

Some 35 million gallons of wastewater flow daily into the Rahway Valley Sewerage Authority (RVSA) treatment plant, and a like volume of effluent flows out, all under the power of gravity.

Andy Sasso wondered: Why not put the energy of that water to work, producing electricity and saving money? Four years ago, Sasso, a shift supervisor at the plant in Rahway, N.J., took an interest in hydro turbines and their potential application in wastewater treatment plants.

Since then, he has been researching the technology, and would like to see treatment agencies around the country give it a closer look. He even went so far as to publish an article about hydro turbines in a 2007 issue of *New Jersey EFFLUENTS*, a publication of the New Jersey Water Environment Association.

Sasso, a 27-year veteran of RVSA, talked about the green power potential of hydro turbines in a recent interview with *Treatment Plant Operator*.

tpo: What triggered your interest in hydro turbines?

Sasso: Turbines caught my eye in 2005. Around that time there was a big push for green power. Hydro turbines are an old concept. The first ones were water wheels. Water turbines have been used from generation to generation. It's a proven technology. I thought a little out of the box and decided you could place turbines in treatment plants and utilize the free energy of flowing water.

I started doing some technical investigation and breaking down the turbines that were available. Some great designs are out there that could utilize your head and velocity flows. You can arrange turbines according to the types that best suit your plant and your need for a supply of power.

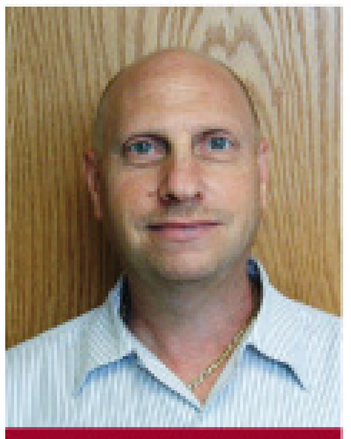
With certain electronic components and controls, you can configure them to operate at 50 Hz or 60 Hz. You could incorporate them very quickly and easily, and also connect them to the utility grid.

tpo: What do you see as the advantages of this technology?

Sasso: You can place hydro turbines in any water source that has an intake and a discharge. They are environmentally safe, with no emissions. There is no cost to run them, as long as the water flow is constant. You have no worries about rising fuel costs.

They're safe in that there is no danger of anything exploding because of a bad fuel mixture. They're very easy to operate, and they basically maintain themselves.

There's no reliance on fossil fuels and there are no emissions whatsoever. And you can place them online quickly to meet rapid increases in electric demand and fulfill emergency energy needs.



Andy Sasso

tpo: What does the basic design of a hydro turbine look like?

Sasso: A basic hydro turbine has a stator, rotor, shaft, wicket gate, and the turbine blades to capture the energy of flowing water.

You could actually retrofit water turbines into your inflow and outflow channels. You could build submersible channels that would create the velocity and the head needed to drive the turbine. A submersible turbine would be placed in a channel at a lower depth than the incoming wastewater supply. As it cascades down, you use that fall, that head pressure, to spin the turbines.

tpo: What would a treatment plant do with the power generated by a small hydro turbine?

Sasso: The easiest way to harness the energy is to connect a hydro turbine to your power grid using an induction generator. This generator automatically synchronizes to the grid, both phase and voltage. It will feed all generated power back to the grid.

tpo: How did you go about researching the technology?

Sasso: I worked on it for about two years. I did a lot of the research on the Internet, and I got hold of a number of technical books. I also spoke with an engineer — Gary St. Onge of St. Onge Environmental Engineering in Amsterdam, N.Y. — who is heavily involved in water turbines.

I picked his brain a little bit, and I really dove into the topic. I just kept exploring turbines and realized there are a great number of them on the market for whatever a given plant really needs. There's a vast amount of information available, and if treatment plants would just look into it, they would find they can utilize this technology.

"Some great designs are out there that could utilize your head and velocity flows. You can arrange turbines according to the types that best suit your plant and your need for a supply of power."

ANDY SASSO

"I believe hydro turbines are going to be the next big thing in green power in the next five years. The energy source is right there in front of us. If we can utilize it, it's there for the grabbing. It's free, and it's waiting to be harnessed."

ANDY SASSO

tpo: What would be the most logical places to install hydro turbines in a treatment plant?

Sasso: The most logical places are the headworks and the outfall. At our plant, for example, we have effluent screw pumps that release the effluent to a cascading waterfall. But the technology could apply anywhere you can get a cascading flow, or a channel where you can install a submersible turbine.

tpo: What is your understanding about the payback on an investment in hydro turbines?

Sasso: The payback depends on the size of the unit, the volume, the velocity of flow, and other factors. Typically, you can recoup your investment in five to eight years.

tpo: What role does renewable energy play in your own treatment plant?

Sasso: We have built a cogeneration facility using a blend of 70 percent natural gas and 30 percent digester methane. We have four Caterpillar engine-generators with 1,500 kW capacity. Right now, we are capturing the heat from the engines to dry our dewatered biosolids and heat our plant in a water loop.

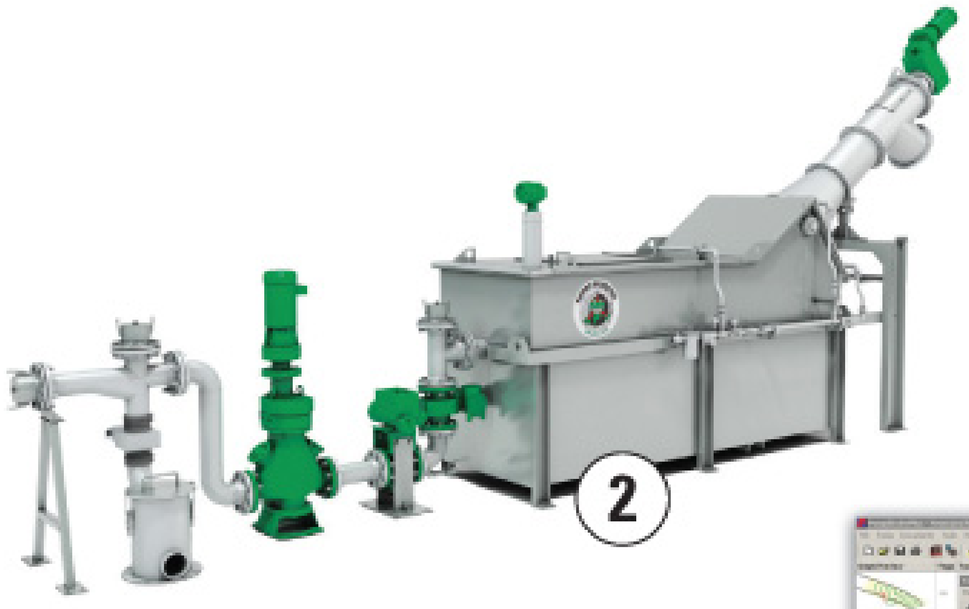
tpo: How do hydro turbines fit in with other forms of green energy being deployed in treatment facilities?

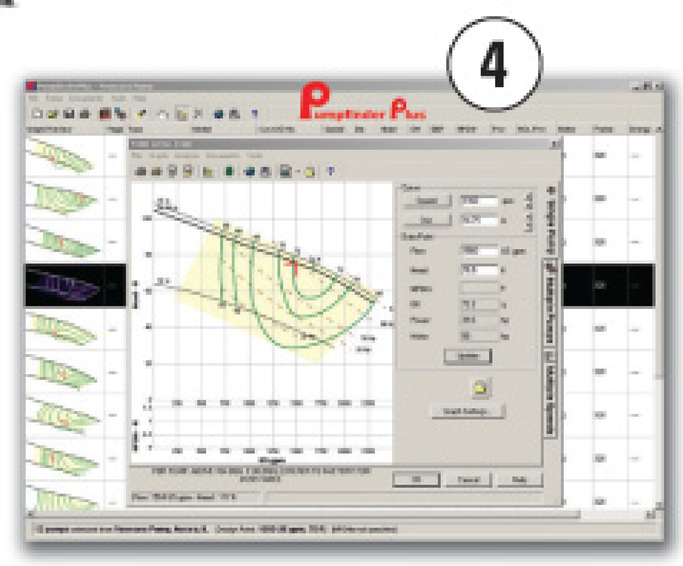
Sasso: By using hydro turbines with wind turbines and solar panels, you could supply 90 percent of your plant's needs from free energy. My whole concept is that it would be great to be the first totally green treatment plant.

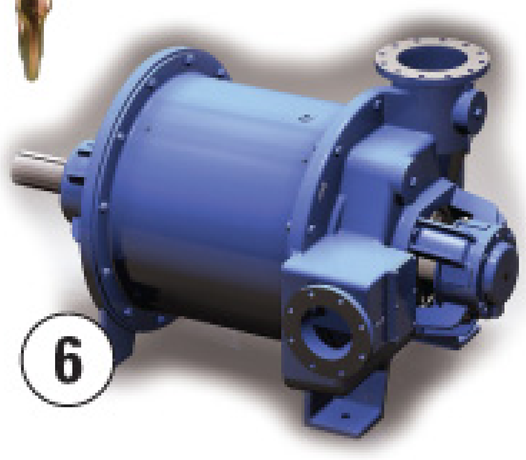
The technology is out there. I believe hydro turbines are going to be the next big thing in green power in the next five years. The energy source is right there in front of us. If we can utilize it, it's there for the grabbing. It's free, and it's waiting to be harnessed. **tpo**

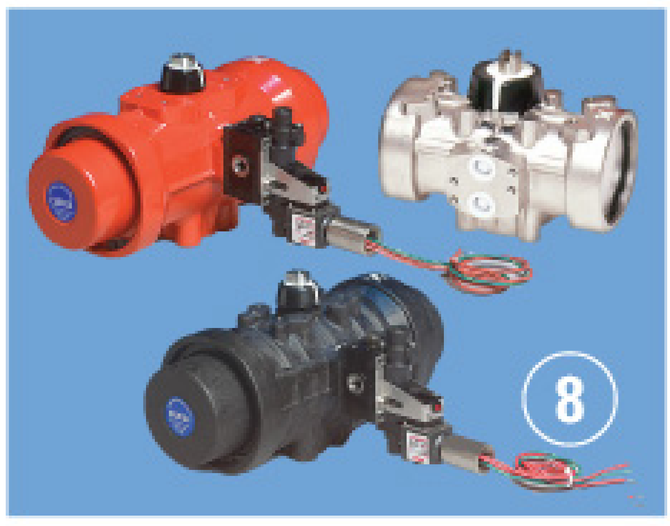
more info:

St.Onge Environmental Engineering (S.E.E.) PLLC
www.hydro-turbines.com









1. MSA INTRODUCES WORKMAN PERSONAL FALL LIMITER

The Workman personal fall limiter from MSA has a 400-pound maximum working capacity and line options from 6 to 12 feet. The PFL meets ANSI A10.32 and all applicable OSHA requirements. Units with 36C style snaphooks and/or 1-inch steel carabiner meet ANSI Z359.1 as well. Select models are CSA certified. **800/672-2222; www.msanet.com.**

2. JWC INTRODUCES HONEY MONSTER SRS-XE

The Honey Monster SRS-XE septage receiving system from JWC Environmental grinds, screens, washes, and dewaters septage, removing trash from the liquid before it enters a wastewater treatment plant. An Auger Monster screen with 1/4-inch perforations filters trash and solids. An optional MonsterTrack control system monitors septage flow, providing receipts for haulers and accurate billing data for plant managers. **800/331-2277; www.jwce.com.**

3. STACO INTRODUCES FIRSTLINE MAINTENANCE BYPASS SWITCH

The FirstLine wall-mounted maintenance bypass switch from Staco Energy Products Co. is designed to provide a safe means of removing an uninterruptible power supply (UPS) from the circuit while maintaining the connection, the load and the utility without dropping critical loads. The interlock ensures that the switch is closed or opened in the proper sequence to avoid improper application of power to the system or the load. The system is available for 208Vac or 480Vac applications. **866/261-1191; www.stacoenergy.com.**

4. YEOMANS OFFERS PUMP SELECTION SOFTWARE

PumpfinderPlus software from Yeomans Chicago Corp. provides free pump selection and sizing assistance for sewage, wastewater and solids-handling pumps. The program offers multiple comparative selections with thumbnail images, online Web access, and supporting documents including specifications, installation drawings and general product information. An online system facilitates submission of quotation and engineering support requests. Alternate versions are available for the company's Chicago Pump, Morris Pumps and Yeomans Pump lines including conventional dry-pit, submersible, submersible dry-pit and suspended wet-pit pumps. **630/236-5500; www.yccpump.com.**

5. MOYNO OFFERS ANNIHILATOR SOLIDS REDUCTION GRINDER

The Annihilator twin-shaft solids reduction grinder from Moyno Inc. features a counter-rotating hexagonal shaft and 5-tooth hardened-steel cutters designed to shred from 300 to 4,250 gpm of influent. Other fea-

tures include bi-directional cutting teeth on the spacers, seal cartridge assembly with mechanical seal and bearing on separate stainless steel sleeves. **937/438-3434; www.moyno.com.**

6. NASH INTRODUCES VECTRA XL 750 LIQUID RING PUMP

The Vectra XL 750 liquid ring pump and compressor from Gardner Denver Nash has low operating speeds, o-ring sealing, oil lubrication, and single point inlet and discharge connections. The vacuum pump operates to 28.5 inches HgV and the compressor to 30 psig. **800/553-6274; www.gdnash.com.**

7. NEPTUNE OFFERS SERIES 7000 METERING PUMP

The Series 7000 chemical metering pump from Neptune Chemical Pump Co. handles viscosities above 5,000 cps. A micrometer dial adjusts capacity while the pump is running. The variable speed drives allow greater turndown range or automatic capacity control. **800/255-4017; www.neptune1.com.**

8. ASAHI OFFERS CORROSION-RESISTANT PNEUMATIC ACTUATORS

The 79P corrosion-resistant, quarter-turn pneumatic actuator from Asahi/America Inc. is engineered to operate on ball and butterfly valves in most harsh applications. The actuator features a 90-degree rack-and-pinion design available on both double-acting and single-acting models. Available with PAG glass-filled polyamide, stainless steel, or cast aluminum body, the actuators have one-piece stainless steel shafts with female output star pattern outdrives, ISO F-series standardized valve mounting bolt patterns and Namur standard solenoid and limit switch interface mounting details. Output torques range from 138 inch-lbs. to 48,818 inch-lbs. for air-to-air models and 59 inch-lbs. to 15,660 inch-lbs. for air-to-spring models. **877/242-7244; www.asahi-america.com.**

RAIN FOR RENT INTRODUCES DV300C SELF-PRIMING PUMP

The DV300c electric self-priming pump from Rain for Rent has a flow rate of 10,000 gpm, handles 3-inch solids, and produces total dynamic

product spotlight

DuraChem 500 series lining systems from AmTech Tank Lining

Lining System Resists Chemicals, Stretches with Tank

By Ed Wodalski

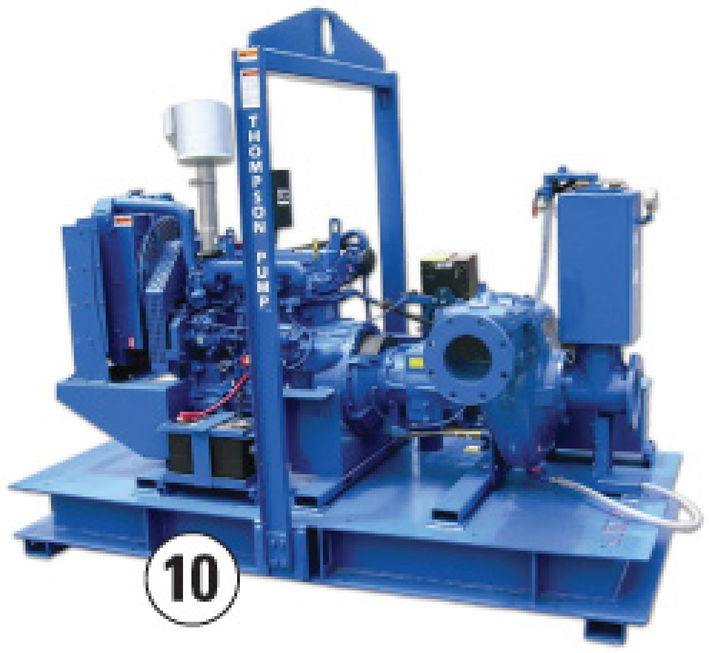
DuraChem 500 series lining systems (540, 560, 580, 580 PW and DK2) from AmTech Tank Lining feature a high-build, high-temperature spray-up application. The 100 percent solids polyethylene coating provides a bonded monolithic wall on cement, steel, laminate, and fiberglass-reinforced plastic vessels.

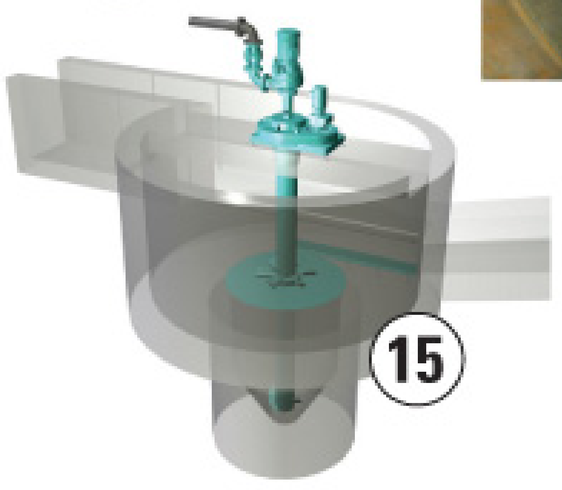
"When we spray-up this system, it's like industrial strength Tupperware," says Rob Pearlman, senior containment systems engineer. "The material has flexibility and ductility that enables the coating to stretch with the tank." The chemical lining, up to 150 mils thick, is blended for specific liquids, such as wastewater or potable water, and resists hydrogen sulfide. Ultraviolet-resistant blends are available for outside tanks.

The lining system will not blister or chip off. "Thin mil layers usually peel off because one small area disbanded," Pearlman says. "That creates a bubble, which ruptures, allowing contaminants to flow under the coating. It's like when your car is scratched. Soon the whole area around it has rust bubbles and you have osmotic blistering."

Coatings that do not expand and contract with the movement of steel and concrete tanks can develop micro-cracks, breeches or bubbles that eventually cause the coating to fail, Pearlman says. DuraChem linings, however, stretch with the substrate and handle up to 1,000 psi. "The monolithic shell inside the tank acts as a barrier between the contents and the substrate," he says. "Some of our systems have elongation characteristics of 580 percent."

As with any substrate damage, such as concrete spalding, steel corrosion or fiberglass delamination, repair and preparation is the key to a successful outcome. If needed, AmTech can perform some or all of the repair and prep work. "Fifty percent of our work is prep work," says Dennis Paquet, containment systems engineer. "Getting that tank ready to go is what takes the time and patience. The way I look at it, you can put the best paint in the world on a '68 Corvette, but if you don't do a lick of prep, in two weeks that paint is coming off." **For more information: 888/839-0373; www.armorshieldlining.com.**





head of 190 feet. Featuring a variable frequency drive and inverted rated motor, the pump is 84 percent efficient at BEP. **800/742-7246; www.rainforrent.com.**

SEL INTRODUCES ETHERNET SECURITY GATEWAY

The SEL-3620 Ethernet Security Gateway from Schweitzer Engineering Laboratories Inc. is designed to protect site-to-site Ethernet communications as well as private networks. Made to work in hard environments, the system operates with existing IT and control systems using an intuitive, menu-driven Web interface. **509/332-1890; www.selinc.com.**

9. HACH DESIGNS HAND-HELD SLUDGE METER

The TSS Portable hand-held meter from Hach Co. offers turbidity, suspended solids and sludge blanket level readings in one instrument. The meter uses a multi-beam alternating light and infrared diode system to measure a wide range of turbidity and suspended solids. It can store up to four different calibration curves for suspended solids and one for turbidity. The meter also recalibrates automatically for different locations or types of sludge and stores up to 290 measuring values, including time, date, measurement, location and homogeneity, and displays data on an LCD graphic. **800/227-4224; www.hach.com.**

10. THOMPSON OFFERS ENVIROPRIME SYSTEM

The Enviroprime priming system from Thompson Pump prevents blow-bys of sewage, debris and chemicals from discharging onto the ground. An air compressor continuously separates air from water as they move through the pump, preventing the venturi from clogging and causing shutdowns. Suited for lift situations up to 28 feet, the system passes 3-inch solids and suspended sand and mud. **800/767-7310; www.thompsonpump.com.**

11. VAL-MATIC OFFERS MEMORY-FLEX DISC

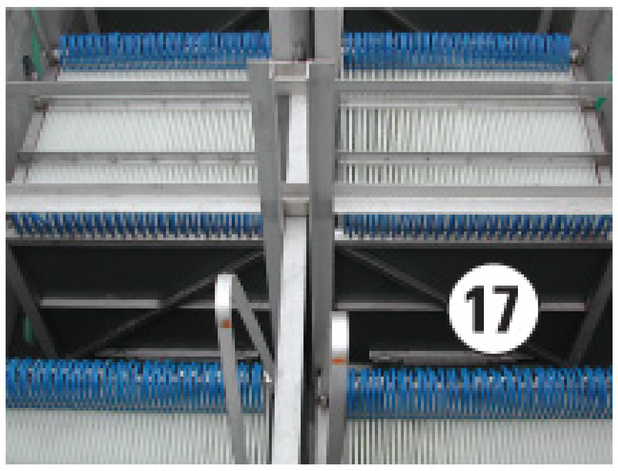
The Swing-Flex check valve from Val-Matic has a Memory-Flex disc, its only moving part, easily replaced without removal of the valve from the line. Its unrestricted, full-flow design makes the unit suitable for slurries and sludge, even in vertical flow-up applications. Non-slam performance is enabled by placing the valve seat on a 45-degree angle, minimizing disc travel. When used with optional rubber lining, the valves are suited to highly abrasive and corrosive applications. **630/941-7600; www.valmatic.com.**

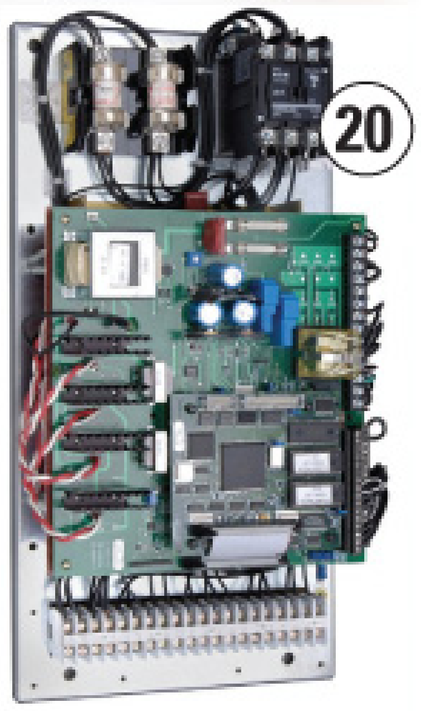
12. SEEPEX OFFERS MDP SERIES CAVITY METERING PUMPS

MDP series progressive cavity metering pumps from Seepex have a one-piece molded Xytel ST801 nylon rotating unit that is unbreakable, abrasion resistant, and runs at low speeds and under high pressure. The pumps, available in four sizes with capacities to 2.5 gpm and pressures to 174 psi, provide pulse-free metering of low- to medium-viscosity fluids with repeatable accuracy up to plus or minus 1 percent. Options include electric motors with integrated frequency inverter and forced ventilation, or mechanical variable speed drives. A manual potentiometer or external analog signal controls speeds from zero to 600 rpm. **937/864-7150; www.seepex.com.**

13. WILO INTRODUCES STRATOS HIGH-EFFICIENCY CIRCULATOR

The Stratos high-efficiency smart pump circulator from WILO USA incorporates Electronic Commutated Motor technology and integral variable speed drive for improved efficiency. The pump constantly fine tunes





fluid circulation to a zone based on the exact level of heating or cooling required in real time, thereby reducing the amount of electricity used. In addition to issuing standard collective error messages, the unit can be optionally connected to local operating networks. Additional interface modules with integrated dual-pump management as well as 0-10 volt DC capabilities can be retrofitted. **866/476-0323; www.wilo-usa.com.**

14. ANUE ENVIRONMENTAL OFFERS EP-1320 WELL-WASHING SYSTEM

The EP-1320 well-washing system from Anue Environmental Inc. is designed to recycle a small amount of discharged wastewater back into the pump station, providing surface agitation for the breakup of fats, oils, grease and biofilm buildup. The system also increases dissolved oxygen levels up to 800 percent and homogenizes solids, as well as providing automated well washdown. The recycled wastewater process requires no external power or water source. **800/559-7159; www.anueenv.com.**

15. SMITH & LOVELESS INTRODUCE PISTA GRIT REMOVAL SYSTEM

The PISTA 360 grit removal system from Smith & Loveless Inc. features a V-Force baffle within a 360-degree, flat-floor grit chamber designed to create a forced vortex that captures grit at all flows. Its ability to handle significant variances between design and peak flow conditions can eliminate the need for multiple grit chambers. The baffle design also serves as a water level control device, reducing the overall outlet footprint requirements by as much as half, and permitting the outlet channel to make up to 90-degree turns immediately after the circular chamber. **913/888-5201; www.smithandloveless.com.**

16. PULSAFEEDER OFFERS MICROVISION-TIMER

The MicroVision-Timer selectable timer controller from Pulsafeeder is a full-function microprocessor with large graphical display, statistics screen with relay run time and battery backup. Features include five selectable timers, five digital inputs with relay outputs, multiple timer formats, and pulse, percent, 28-day biocide or cycle program modes. **941/575-3800; www.pulsafeeder.com.**

ENVIRONMENTAL OPERATING SOLUTIONS INTRODUCES METHANOL SUBSTITUTE

MicroCgycerin premium carbon from Environmental Operating Solutions Inc. is a nonhazardous, environmentally-sustainable and domestically produced alternative to methanol for denitrification applications at municipal and industrial wastewater treatment facilities. The product is derived from crude glycerin, a natural co-product of biodiesel. **508/743-8440; www.eosenvironmental.com.**

17. BORD NA MONA INTRODUCES PURAM BIOREACTOR

The PuraM membrane bioreactor pre-engineered system from Bord na Mona Environmental Products U.S. Inc. is available in a range of mobile prefabricated carbon steel or stainless steel tank configurations capable of treating flows from 7,000 to 125,000 gpd. Engineered specifically for the decentralized municipal, community and commercial markets, the system is based on flat plate ultra-filtration membrane technology assembled into stainless steel membrane cassettes. The cassettes consist of an integral dedicated air diffuser assembly that eliminates the need for back-pulsing or frequent chemical cleaning. It does not require permeate pumps or any site installed chemical dosing system, while achieving a typical time between recovery cleans of approximately 12 months. **336/547-9338; www.bnm-us.com.**

18. MELTRIC OFFERS DXN37C MULTIPIN PLUGS

The DXN37C multipin plugs and receptacles from Meltric Corp. have 37 electrical contacts, each carrying 5 amps at 220 volts. The ATEX-rated plugs connect and disconnect quickly from machinery or systems with multiple control loops, feedback switches, photo eyes, lights and other devices. **800/433-7642; www.meltric.com.**

19. ACCUSONIC INTRODUCES TRANSIT-TIME FLOWMETER

The Model 7720 transit-time flowmeter from Accusonic Technologies meets the installation requirements of ultraviolet disinfection systems. It measures flows in pipes and channels from 8 inches to 500 feet. The unit measures up to 10 paths in the same measurement section by using multiple-path chordal transit-time technology. Even in distorted flow profiles, it achieves an accuracy of plus or minus 0.5 percent in full pipes and plus or minus 2 percent in partially full pipes and channels. **508/237-9600; www.accusonic.com.**

20. DRIVE SOURCE OFFERS EC-2000 SPEED DRIVE CONTROL

The EC-2000 family of digital Eddy Current variable speed drive controls from Drive Source International Inc. are independently tested and designed for lower annual maintenance and reliability. The controller consists of a single printed circuit board rated for 115 VAC, 1 phase, 60 Hz input. It has the flexibility of 45 of 90 VDC coil voltage at 8 amps and is available for use with a range of drives and brakes rated 1 through 200 hp and high-powered applications up to 2,000 hp. **800/548-2169; www.drivesourceusa.com. tpo**

Tanks and Structures

By Benjamin Wideman

VERTICAL TANKS

High-density, crosslink or FDA-compliant linear polyethylene vertical **storage tanks from Assmann Corp. of America** have molded-in manways and gallon marks. One-piece seamless construction and uniform wall thickness enable the 40- to 12,000-gallon tanks to resist chemicals and corrosion. They are UV stabilized and certified to NSF/ANSI Standard 61. Accessories include fittings, heat tracing, insulation, gauges, tie downs, and ladders. Custom designs are available. **888/357-3181; www.assmann-usa.com.**

Storage tanks from Assmann Corp. of America

LINEAR ELECTRO-DEWATERING

Installed after mechanical dewatering units, the **CINETIK line of linear electro-dewatering solutions from EIMCO Water Technologies** uses controlled mechanical pressure and electro-osmosis to produce 50 percent total solids for even secondary and mixed biological sludge. An electrical field generated inside the sludge induces the electro-osmosis. The equipment has fingertip operation, adjustments for varying sludge characteristics and parameters, and integrates with existing processes and equipment. The compact, energy-efficient units also reduce pathogen levels. **512/834-6000; www.eimcowatertechnologies.com.**

FIBERGLASS BASINS

Topp Industries Inc. has 96- and 120-inch fiberglass sump and sewage basins manufactured to ASTM D3753. Their inside diameters measure18 to 120 inches. The 96-inch basins hold 3,008 to 7,520 gallons; the 120-inch diameter basins hold 4,700 to 11,750 gallons. **800/354-4534; www.toppindustries.com.**

HEADWORKS PLANTS

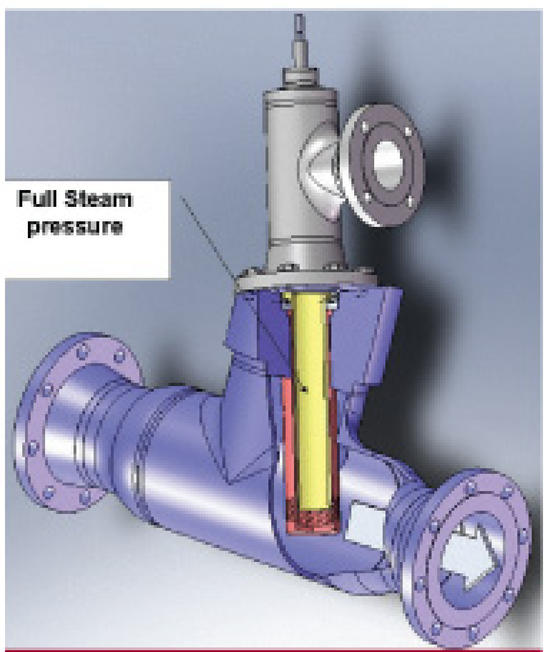
Constructed from 304-stainless steel, packaged **headworks plants from Hi-Tech Environmental Inc.** arrive partially assembled with screening, grit collection, screening washing, shaftless flighting, segmented replaceable screen brushes, and weather protection.

Headworks plants from Hi-Tech Environmental Inc.

CINETIK line of linear electro-dewatering solutions from EIMCO Water Technologies

HEATING SOLUTION

The **PSX inline direct steam injection heater from ProSonix LLC** heats viscous wastewater sludge in anaerobic digestion. The inline design and angled steam injector eliminate plugging and hang-ups. The steam diffuser's variable flow plug controls the mass flow, while the plug's integral pneumatic actuator controls its position. Internal modulation injects steam at sonic velocity to ensure complete condensation and mixing in difficult-to-heat fibrous slurries.



PSX inline direct steam injection heater from ProSonix LLC

Sump and sewage basins from Topp Industries Inc.

TurboDrum IF from Headworks Inc.

Systems are tested in-house before shipping. The self-contained tanks have a flanged inlet and outlet. **800/264-7005; www.hi-techenv.com.**

Integrating the heater and 1 to 2 psig liquid pressure drop reduce energy demand and minimizes process upsets. Units handle 1 to 10,000 gpm with temperature control of plus or minus 1 degree. Heaters are constructed of 316-stainless steel or carbon steel with wear coatings for aggressive fluid applications. **800/849-1130; www.pro-sonix.com.**

INTERNALLY FED DRUM SCREEN

The internally fed drum screen on the **TurboDrum IF from Headworks Inc.** has 0.25mm openings for fine liquid-solid separation. The heavy-duty screen removes hair, fibers and suspended material, and works well when paired with membrane bioreactors, package treatment plants, and 15.2-mgd sludge dewatering and thickening processes. **877/647-6667; www.headworksusa.com.**

OIL-WATER SEPARATOR

The portable **SS-MEGA-OWS stainless steel coalescing oil-water separator from Megator Corp.** handles various viscosities, temperatures, chemicals, and flows of 125 gpm. **412/963-9200; www.megator.com. tpo**

SS-MEGA-OWS separator from Megator Corp.

people/awards

British Columbia

The British Columbia Water & Waste Association has named these award recipients:

- **Jack Bryden,** Stanley S. Copp Award.
- **Darcy Dragonetti** and **Glen Brown,** 5S Society.
- **Ymir Water Treatment Plant,** Small Water System Award.
- **Cowichan Valley Regional District,** Decentralized Wastewater Management Award.
- **Eric Jackson,** Victor M. Terry Award.
- **Mike Nolan,** George Warren Fuller Award (AWWA).
- **John Delver,** Kenneth J. Miller Award (Water for People).
- **Gordon Proctor,** AWWA Gold Water Drop.
- **Lawrence Benjamin, Alan Grant, Brian Johnston, Robert Jones** and **Thomas Moscrip,** AWWA Life Member Awards.

Missouri

The Missouri Water Environment Association has named these award recipients:

- **Dennis Hudson,** William D. Hatfield Award.
- **Danny Rowatt,** Arthur Sidney Bedell Award.
- **David Greene,** Laboratory Analyst Excellence Award.
- **City of Independence,** Burke Facility Safety Award.
- **Brittney King,** Stockholm Junior Prize Award.
- **Gary Miller** and **Don Gilpin,** MWEA Operator of the Year Awards.
- **City of Warrensburg-East Plant** and **Little Blue Valley Sewer District,** MWEA Treatment Plant of the Year Award.
- **Dan Scherer-O'Fallon,** Collection System Award.

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

- **Missouri River Plant** and **City of Kearney,** MWEA Biosolids Management Awards.
- **City of Wenzville** and **City of Columbia,** Collection System Safety Awards.
- **City of Wentzville** and **City of St. Peters,** MWEA Treatment Plant Safety Awards.
- **Paul Freedman, Joe Huffman, Robert Januska** and **Richard Johannes,** 5S Awards.
- **Rodney Jones, David Miguel, Jeff Mock** and **Kevin Swearengen,** MWEA Golden Manhole Awards.

Mike Worlton was named a leader of a new water and wastewater practice in Arizona for AMEC, an international engineering and project management company.

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

associations

Atlantic Canada Water Works Association

The ACWWA has these workshops and seminars:

- Oct. 6-9 – Wastewater Treatment, Fredericton, New Brunswick
- Oct. 14 – Water and Wastewater Operator Exam, Sydney, Nova Scotia

Visit www.acwwa.ca.

California Water Environment Association

The CWEA has a Safetyfest seminar on Oct. 28 in Woodland. Call 650/832-6251 or visit www.cwea.org.

Indiana Water Environment Association

The IWEA is offering these workshops/exams:

- Oct. 27 – IWEA Collections Systems Certification Exam, Indianapolis
- Oct. 29 – IWEA Collections Systems Certification Exam, Fort Wayne

Call 317/328-2151 or visit www.indianawea.org.

Kansas

The Kansas Water Environment Association has these workshops:

- Oct. 1 – Basic Wastewater, Mulvane
- Oct. 1-2 – Wastewater Treatment, Pittsburg
- Oct. 2-3 – Natural Systems for Wastewater Treatment, Dodge City
- Oct. 10 – Small Systems Wastewater, Goodland
- Oct. 14-15 – Water Distribution and Wastewater Collections, Lyons
- Oct. 15-16 – Wastewater Treatment, Bonner Springs
- Oct. 21 – Ultraviolet for Water and Wastewater Treatment, Garden City
- Oct. 21 – Advanced Wastewater, Holton
- Oct. 22-23 – Wastewater Treatment, Olathe
- Oct. 28 – Applied Math for Wastewater Operators, Dodge City
- Oct. 30-31 – Wastewater Reclamation and Reuse, Goodland

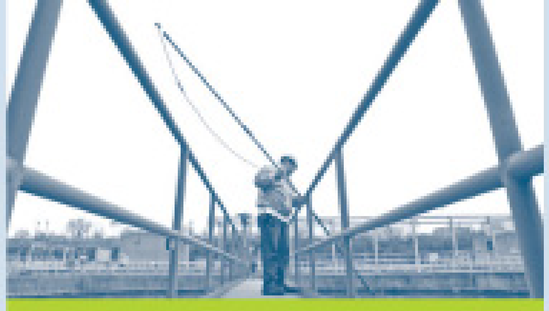
Call 785/357-4780 or visit www.kwea.net.

Wisconsin

The University of Wisconsin-Madison Department of Engineering Professional Development is offering the following classes at the Madison campus:

- Oct. 5-7 – Designing and Constructing Sanitary Sewer Systems
- Oct. 29-30 – Pumping Equipment and Systems: Selecting, Operating, Maintaining and Troubleshooting

Call 608/262-2061 or visit http://epdweb.engr.wisc.edu. tpo



CALENDAR OF EVENTS

Oct. 3-11
International Activated Carbon Conference and Courses, Holiday Inn Airport, Pittsburgh, Pa. Call Barbara Sherman at 800/367-2587 or visit www.paclabs.com.

Oct. 10-14
WEFTEC 2009 Water Environment Federation Technical Exhibition and Conference, Orange County Convention Center, Orlando, Fla. Call 800/666-0206 or visit www.weftec.org.

Oct. 18-20
Atlantic Canada Water and Wastewater Conference, Marriott Halifax Harbourfront, Halifax, N.S. Visit www.wef.org.

Oct. 19-21
North Dakota Water Environment Association Annual Meeting, International Inn, Minot. Visit www.wef.org.

Nov. 3-4
Georgia Association of Water Professionals, Athens. Call 770/618-8690 or visit www.gawp.org.

Nov. 5-7
Nebraska Water Environment Association Annual Conference, Holiday Inn, Kearney. Call 402/444-4911 or visit www.ne-wea.org.

Nov. 15-18
North Carolina Water Environment Association Annual Conference, Raleigh Marriott Downtown/ Raleigh Convention Center. Call 919/ 784-9030 or visit www.ncsafewater.org.

Nov. 17-19
Indiana Water Environment Association Annual Conference. Indianapolis Marriott East Hotel. Call 317/328-2151 or visit www.indianawea.org.

tpo CLASSIFIED ADVERTISING

OCTOBER

BLOWERS

VFC200P-5T, FUJI Pumps, Regenerative Blowers, Ring Compressors. All models, accessories. Authorized distributor. Authorized parts and repair center. Call 888-227-9822. www.carymfg.com (PBM)

DEWATERING

Septic Receiving Station,10 gauge double wall stainless steel tank, w/4" flanged inlet. Wash assembly, 12" outlet, flow meter/plug valve rock trap stainless auger/brush and roll pins, stainless steel spray wash grinder, 12" cutting chamber, 7 tooth cam 4130 alloy steel, 5hp, 3.7kw 29:1 reducer controller, pc2450-100503, operater interface, panel heaters, billing card reader, receipt printer.emerg.stop button, connection to scada system, 2hp, 1.5kw, serial# 100503. Total flow meter. Contact Tim 832-473-7222. (CMP11)

Netzsch Plate Filter Press no. 1200/LP/III for sale. Excellent working condition with controls and documents. Automated plate open/close. New filter fabric, ready to install. Asking $70,000. Call 717-587-1917 for details. (PT11)

WANTED

QUALITY SURPLUS POLYMER WANTED: Email product number, polymer form, purchase date and quantity. Will attempt to make a cash offer. Also I can offer aggressive prices on our polymer sales to you. Email stuart@acpsouth.com. (O11)

WATERBLASTING

USED SURPLUS EQUIPMENT FOR SALE: 1985 GMC 6000 truck mounted waterblaster with 1994 NLB 8150 waterblaster unit (8,000 PSI @ 32 GPM); 1990 GMC 7000 truck mounted waterblaster with 1980 NLB 1012 waterblaster unit (10,000 PSI @ 16 GPM); 1987 GMC truck mounted waterblaster with 1995 NLB 10-250 waterblaster unit; 10,000 PSI NLB electric waterblaster, model #10150E, skid mounted with wheels; 5000 PSI electric waterblaster model #5K4286B22A1-F2-Giant pump, G.E. 20 hp motor-skid mounted with wheels. For more info contact Steve 1-313-600-1501; sliabenow@kdigroup.com. (P9)

tpo CLASSIFIED AD FORM Treatment Plant Operator

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