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February 2013

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Alan Packard
Assistant general manager
and chief engineer
Salt Lake County, Utah

CONSERVE AND CONTROL

Jordan Valley reduces maintenance costs
by focusing on conservation opportunities

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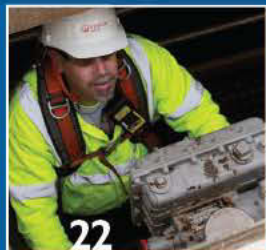


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ON THE COVER:

Jordan Valley Water Conservancy District assistant general manager and chief engineer Alan Packard is helping lead his operation's charge toward greater system efficiency. Jordan Valley's comprehensive conservation programs have already reduced water use by 20 percent, which has been instrumental in lowering capital investments. (Photography by Chris Detrick)



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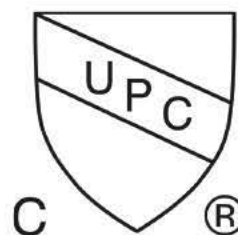
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FOR SANITARY, STORM AND WATER
SYSTEM MAINTENANCE PROFESSIONALS

Published monthly by:



1720 Maple Lake Dam Rd., PO Box 220,
Three Lakes WI 54562



www.mswmag.com

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Email: info@mswmag.com / Fax: 715-546-3786

Office hours Mon.-Fri., 7:30 a.m.-5 p.m. CST

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EDITORIAL CORRESPONDENCE: Send to Editor, Municipal Sewer & Water, PO. Box 220, Three Lakes, WI, 54562 or email editor@mswmag.com.

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

CIRCULATION: 2012 average circulation was 40,581 copies per month (U.S. and international distribution).



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FINDING NEW PATHS TO SUCCESS

MSW and the Pumper & Cleaner Expo showcase better ways for municipal utilities to move forward

The tools, strategies and ingenuity to build stronger utilities will be featured at the 2013 Pumper & Cleaner Environmental Expo, and they're on display in this issue. In addition to the Expo Product Preview, the feature profiles in this issue demonstrate an enterprising spirit and blueprints for better municipal operations.

The South Bend (Ind.) Public Works Department is a great example. Faced with significant CSO

problems, the department turned to the bright minds at Notre Dame and Purdue universities who developed a system employing a series of embedded sensors coupled with battery-powered, credit-card-sized computers to conduct real-time monitoring and control of wastewater and stormwater.

South Bend began installing the system at 110 locations in mid-winter 2008. The city was able to combine the network with its own SCADA system and IBM's Intelligent Operations Center for Smarter

Cities to form a comprehensive system capable of crunching all the data, presenting it in a usable form and translating the information into instructions that serve the department's operational goals.

Wet-weather overflows have since been reduced by 23 percent and dry-weather overflows have

Jordan Valley serves a steadily growing population in the Salt Lake City area, part of one of America's driest states. Through comprehensive conservation programs, the district has already reached a 20 percent reduction in water use, and water conservation measures have been instrumental



FROM THE EDITOR

Luke Laggis

All these utilities have found better ways to tackle their problems, and as many of you know, that's really what the Pumper & Cleaner Environmental Expo is all about, too.

been reduced from 27 occurrences to one in the system's first full year of operation. By mid-2012, it was estimated that simply using existing infrastructure in a more efficient way has helped the city avoid more than \$600,000 in potential government fines while potentially offsetting more than \$100 million in capital infrastructure costs.

The willingness of city officials to seek out new solutions and find a better way to manage CSO problems saved money for the community and greatly reduced pollution of the St. Joseph River.

The Jordan Valley Water Conservation District and the Fall River Sewer Commission, also profiled in this issue, show a similar focus on improving operations. Fall River has spent the better part of the past three decades working to eliminate its own significant CSO problem. The city has spent \$165 million to address its problems, and the work isn't done. The results, however, are already clear: Overflows are down significantly and local water quality has improved substantially.

in lowering capital investments. So far, reduced water consumption has saved millions of dollars in postponed water supply projects that would have otherwise been necessary.

All these utilities have found better ways to tackle their problems, and as many of you know, that's really what the Pumper & Cleaner Environmental Expo is all about, too. It's coming up at the end of this month in Indianapolis and it's a great way to network and gain the insight of peers who are dealing with similar challenges. Education courses, demonstrations and over 550,000 square feet of show space will give you a new perspective on the innovations driving the industry forward and improving communities like yours.

All the information you need to make plans to attend the Expo can be found at www.pumperandcleaner.com. If you make it to Indy, be sure to track me down. I'd like to hear your story.

Enjoy this month's issue. ♦

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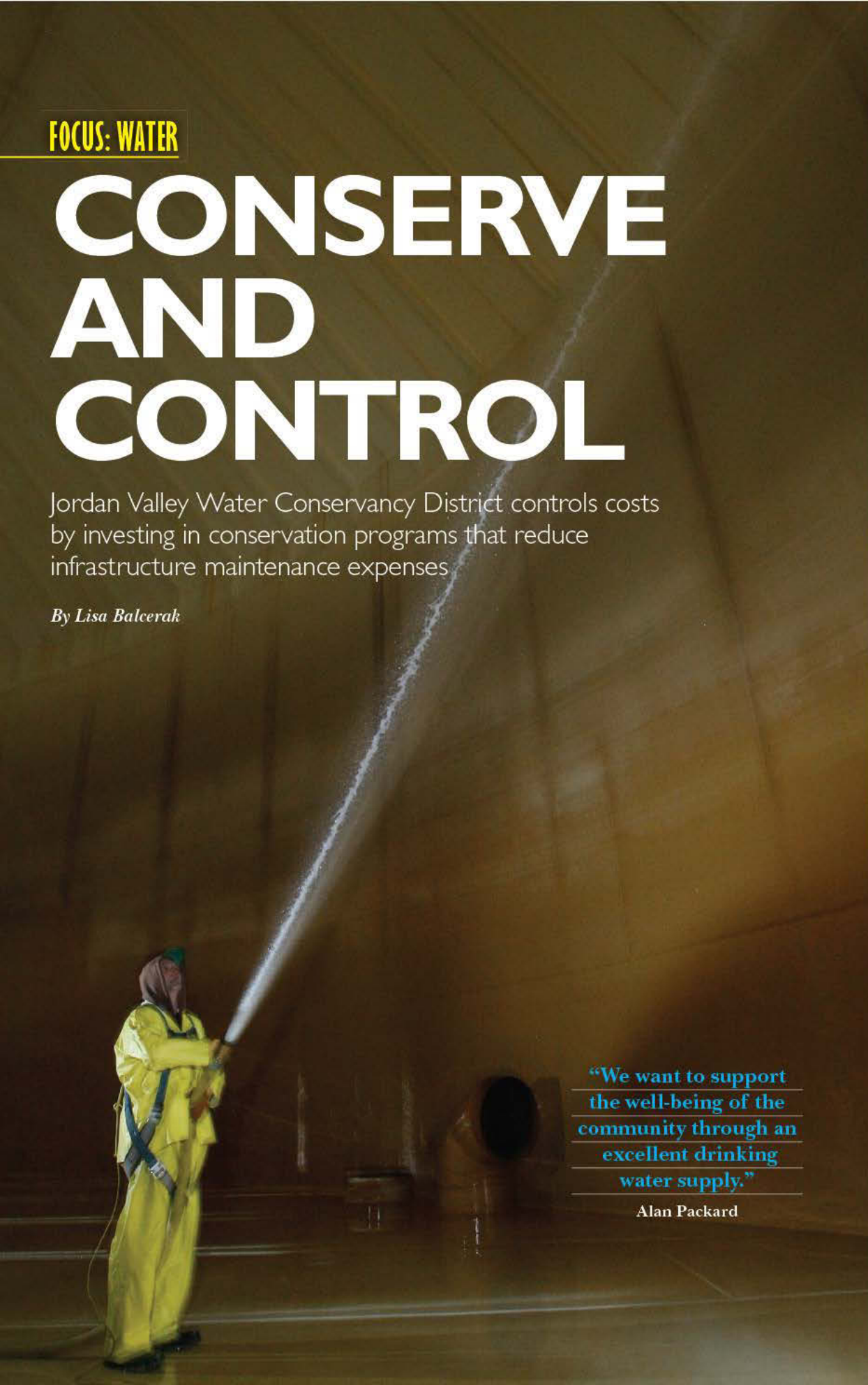
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CONSERVE AND CONTROL

Jordan Valley Water Conservancy District controls costs by investing in conservation programs that reduce infrastructure maintenance expenses

By Lisa Balcerak



**"We want to support
the well-being of the
community through an
excellent drinking
water supply."**

Alan Packard

Despite being located in one of the driest states in the country, Salt Lake County, Utah, enjoys high-quality water sourced from snow pack in the pristine Wasatch and Uinta Mountains. To conserve water in that area while controlling operating costs, Jordan Valley Water Conservancy District has adopted an aggressive conservation program.

Created under the Water Conservancy Act in 1951, Jordan Valley Water is a drinking water wholesaler that serves nine member cities, five member districts, and three other member agencies in bedroom communities south of Salt Lake City. In addition, about 10 percent of water deliveries are for direct retail service to 8,500 homes and businesses in unincorporated areas.

To serve a population of 600,000, Jordan Valley Water relies primarily on water stored in two reservoirs located in the mountains. Water from these reservoirs is conveyed to two Jordan Valley Water treatment plants for conventional treatment before being distributed. The wholesaler also operates 31 wells, which produce high-quality water requiring no additional treatment. The water is delivered to 150 meter stations where the member agencies take the water to store or distribute to their own customers. In total, Jordan Valley Water distributes approximately 90,000 acre-feet per year, which averages about 80 mgd.

Pipeline maintenance

A big challenge for Jordan Valley Water is serving the steadily growing population. By 2050, Salt Lake County's population is expected to double.

Jordan Valley Water Conservancy District lead maintenance worker Leonard Mascher washes out the inside of the 8-million-gallon water reservoir in Taylorsville. (Photos by Chris Detrick)

(continued)

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Jordan Valley Water Conservancy District crew member Brad Boren adjusts a valve seat at the 66-inch-diameter Southwest Aqueduct in Bluffdale, Utah.

"We've got a lot of work to do to keep up with that kind of growth. Our goal is to make sure we have adequate water supply for the service area," says Alan Packard, assistant general manager and chief engineer. "We want to support the well-being of the community through an excellent drinking water supply."

Providing water to so many communities involves 286 miles of pipeline, varying in diameter from 6 to 78 inches. Jordan Valley Water employs 135 full-time employees, including 70 people responsible for the operations and maintenance of the pipeline and distribution system. The district's annual budget is \$70 million for operation and maintenance expenses and capital improvements.

Ongoing maintenance keeps an aging pipeline in working order and allows Jordan Valley Water to make necessary additions to meet future capacity needs. Projects to repair or upgrade pipes, reservoirs and vaults are always in progress.

One recent project involved installing 4 miles of 36-inch steel pipe to replace a deteriorating 16-inch pipeline. In addition, the project included the installation of 1,600 feet of 60-inch pipe, a large flow control vault, two mainline valve vaults, and three new meter stations. Jordan Valley Water uses the traditional design/bid/build project delivery method. The project, which cost \$10.3 million, took 12 months to design and 18 months to con-



struct using typical open-cut trench excavation methods in roadways.

Outside contractors are hired for most major repair and construction projects, but Jordan Valley Water's team leases backhoes, a mini-excavator and a mini-loader for performing smaller jobs. The district also owns a backhoe, two 10-wheel dump trucks, a smaller dump truck, and a vacuum truck for potholing.

Conserving water and costs

In 2000, the Governor's Water Conversation Team, comprised of water providers throughout Utah, began a conservation campaign with the goal of reducing per cap-

ita water consumption by 25 percent by 2050. Jordan Valley Water took that goal one step further.

"Our board of trustees wanted a more aggressive goal, so our district's goal is to reduce per capita consumption by 20 percent by 2025, in half the time of the state's goal," Packard says. "It will help

Plants and lawn grasses at the Conservation Garden Park in West Jordan.



PROFILE:
Jordan Valley Water Conservancy District, Utah

POPULATION:
600,000

SERVICE AREA:
211 square miles

ANNUAL RAINFALL:
16 inches

ANNUAL BUDGET:
\$70 million

WEBSITE:
www.jvwcd.org

CONSERVATION MATTERS DURING DROUGHT

During a substantial drought in the Jordan Valley district from 2000 to 2005, conservation programs were widely used to help people understand the need for reduced water consumption.

"'Slow the Flow' was widely recognizable during that time, and people responded well," says Courtney Brown, conservation programs manager. "Per capita water use dropped off significantly. They were hearing the message that we are in a drought, we live in a desert and need to use less water. They wanted to change."

Jordan Valley Water expected a rebound after the drought, but many citizens continued with their conservation efforts. "In general, most people are receptive to the message of conservation and want to do their part to conserve," Brown says. "Through education, people are interested in sustainability and want to do things that are sustainable long term. Water is sustainable if we use it correctly and don't waste it on ineffective irrigation practices."

(continued)

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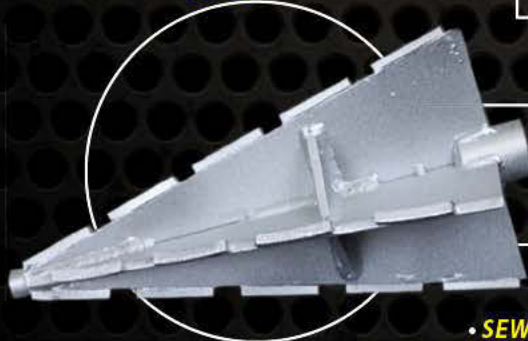
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our members by stretching our existing supplies further.”

Through comprehensive conservation programs, Jordan Valley has already reached a 20 percent reduction in water use. In 2000, the per capita water use in Jordan Valley Water’s service area was 225 gpd; in 2011, it was 204 gpd.

Water conservation measures have been instrumental in lowering capital investments. “Because of lower consumption, there are projects we haven’t had to implement,” says Courtney Brown, conservation programs manager. “When people conserve water, it enables us to defer costly new water development projects.”

So far, reduced water consumption has saved the district millions of dollars in postponed water supply projects that would have otherwise been necessary. For example, 20 years ago, Jordan Valley Water projected a demand increase due to population growth that would require an expansion on its largest treatment plant by 2015. Despite the continued population growth,

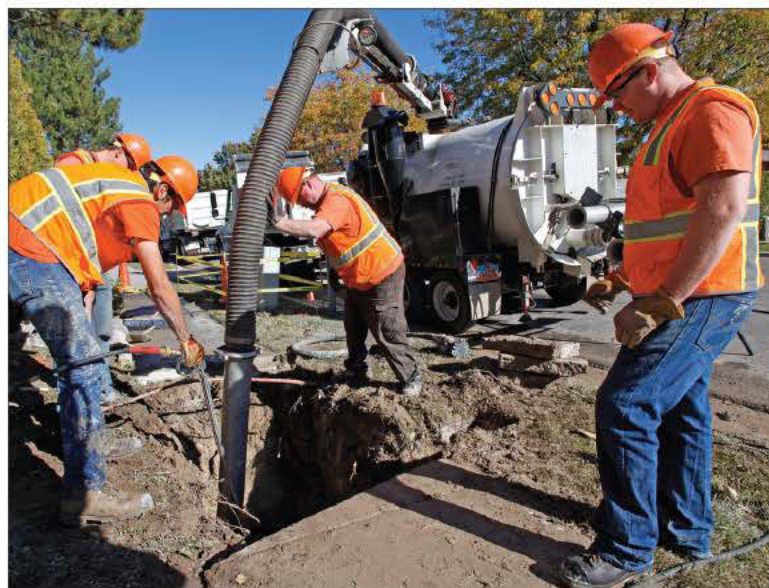
“When people conserve water, it enables us to defer costly new water development projects.”

Courtney Brown

the reduced per capita consumption has allowed Jordan Valley Water to postpone the plant expansion until 2025, saving the district approximately \$100 million.

Conservation garden

Jordan Valley Water has a multifaceted conservation program that provides education, funding and support targeted at three audiences: homeowners, children and landscape professionals. The centerpiece of the program is the 6.5-acre Conservation Garden Park. In 2000, the garden began as a place to feature a variety of finished landscape themes with different water requirements. Traditional landscapes were set next to landscapes that require no supplemental watering, helping homeowners understand landscape water use and compare available options. A few years later,



Crew members Glen McIntyre, Calin Perry, Jarod Moffitt and Clint Thurgood use a combination unit from Sewer Equipment Co. of America to repair a water main break.

the garden evolved to a second phase.

“We found that we were giving homeowners ideas on how to save water but we weren’t educating them on how to do it on their own,” Brown says. “There was interest in that, so we expanded the garden with 24 exhibits that teach the

principles of water-wise landscaping, such as drip irrigation, sprinkler systems, planting techniques, composting and mulch. In those exhibits, people can see and touch things, and they can learn the principles.”

In an effort to drive visitation to the garden, the district created



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STRIKING A BALANCE

Although conservation is important to keeping operating costs down, Jordan Valley Water knows that it's necessary to have a viable level of water usage to be properly funded. Most of the district's funds are from water rates, property taxes, and impact fees for new connections on the retail system.

"We see it as a water supply issue that has to be kept in balance," says Alan Packard, assistant general manager and chief engineer. "If we conserve a lot too quickly in one year, then it can be difficult for the water district." However, a growing population has resulted in a 6 percent increase in the total revenue generated by wholesale and retail water sales over the last couple years.

the Environmental Encounters program, which invites school groups for a one-hour tour. To make the trip more appealing for teachers, the tour can be customized to cover topics specific to the teacher's own curriculum, and bus costs are reimbursed by Jordan Valley Water.

Jordan Valley Water has partnered with the Utah Master Garden program, part of the Utah State University Cooperative Extension, to lead the Environmental Encoun-

ter tours and get additional volunteer support in the garden. Master gardeners get their required volunteer hours for the program and the district gets volunteer assistance.

A third phase to the Conservation Garden Park, adding a 9,400-square-foot education center, was completed in December 2011. The center has three classrooms for hosting events and classes, which cover a variety of topics such as landscape design, types of plants,

and how to choose and install an irrigation system. The goal of the classes is to cultivate customers who make smart choices about water usage.

"People are attending the classes to learn about what they can do to make their landscapes better," Brown says. "We want to help them save water by making changes in their landscapes. They can water their lawn correctly and save water, and we want to teach them how to do that. If they plant and irrigate correctly, they will save water."

Professional landscapers are an important audience for contributing to water conservation, so Jordan Valley Water began the Qualified Water Efficient Landscaper (QWEL) program. Originally started in Sonoma County, Calif., Jordan Valley Water adopted the program in September 2012 to give landscapers in Utah a place to get certification in water-efficient design and irrigation. "It has been a challenge to get landscape professionals to come to classes and visit the garden," Brown says. "QWEL certification makes landscapers more marketable."

The 24 hours of classroom instruction are provided by Utah State University professors, and certification is through the Utah Nursery and Landscape Association. Jordan Valley Water expects to expand the QWEL program to more locations throughout the state in the future.

Additional conservation programs

The "Slow the Flow" program, originally started by Jordan Valley Water in 2000, later was adopted by the Governor's Water Conservation Team as a statewide initiative that still operates today. It includes television advertising that stresses smart water usage for outdoor and in-home use.

All water providers have experienced the occasional call from homeowners wanting to know why a water bill was especially high one month. The Water Check program helps address those calls by providing free irrigation system audits to homeowners and businesses in the Jordan Valley Water service area. Conducted by horticulture and landscape design students from Utah



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Jordan Valley Water Conservancy District maintenance workers include, from left, Leonard Mascher, Adrian Parra, Danny White and Bradon Young.



Jordan Valley Water Conservancy District crew members include, from left, Calin Perry, Clint Thurgood, Steve Beck, Jarod Moffitt and Glen McIntyre.



Brad Boren stands beside the 66-inch-diameter Southwest Aqueduct in Bluffdale during a routine maintenance operation.

State University, auditors evaluate infiltration rates, irrigation system precipitation rates, uniformity and pressure, and root depth. Based on that information, a customized irrigation schedule is provided.

Jordan Valley Water also offers a Member Agency Assistance program to encourage water conservation among its members. The program provides grants to members for initiatives such as rebates for high-efficiency toilets, rebates for smart irrigation system controllers, educational programs, and demonstration gardens. One member agency received a grant to upgrade its own public park irrigation.

"New irrigation controllers improve efficiency in watering," Brown says. "It can allow for the sprinkler system to turn off during a rain event, for example." There are two basic types of smart controllers: weather-based and sensor-based. Weather-based controllers use real-time weather information such as temperature, humidity and wind, to automatically adjust the amount of water applied to a landscape. Sensor-based controllers make watering adjustments based on the soil moisture level in the landscape, which is provided by soil moisture sensors. In short, smart controllers save water by making frequent

adjustments automatically to the watering schedule set by the user.

To conserve water in the district's own pipeline, Jordan Valley Water monitors meters to identify discrepancies and to help locate potential meter problems or leaks.

Investing in conservation

Funding for the conservation programs comes primarily from Jordan Valley Water's operating budget. In addition, the Jordan Valley Conservation Garden Foundation was established in 2005 to cover costs specifically for the garden. The foundation conducts fundraising events, solicits dona-

tions and reaches out to the community for financial support.

Two full-time staff (a garden manager and lead horticulturalist) and six seasonal staff are employed to keep the Conservation Garden Park an attractive showcase of water-wise landscaping. A lot of volunteers from schools, scouting groups, corporations, the university and the Master Garden program also provide free help.

Long-term sustainability

Water rates alone have not motivated citizens to reduce their consumption because water in the Jordan Valley district is fairly inexpensive. Therefore, education has been the most important ammunition for driving conservation.

Brown feels that future conservation education messages may change as water prices inevitably increase due to climate change and population growth. "It takes a lot of energy to deliver and treat water, so one of the messages we will try to get out there is that when people save water, they are also saving energy," he says. "It's another motivation for conservation." ♦

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TIP A FROSTY MUG

Expo visitors can whet their whistles at several Indy craft breweries and explore walkable downtown restaurant destinations

By Sharon Verbeten

In a state that's home to more than 50 breweries, no frosty mug will go unfilled. Many of those breweries — more than a dozen — are housed in the greater Indianapolis area.

"Craft beer in Indianapolis has been a part of our city's culture for over 20 years," says Clayton Robinson, owner of Sun King Brewing Co. "Over the last four years, there has been an explosion of breweries and interest in craft beer. Indiana led the 2012 Great American Beer Festival with the greatest percentage of medals to entries, so there is plenty of world class beer to discover and enjoy."

Sun King is among the largest breweries in the state, making handcrafted seasonal and specialty beers. Its house beers include Sunlight Cream Ale, Wee Mac Scottish Ale and Osiris Pale Ale. Its brews were among those honored at the Great American Beer Festival, as well as the Indiana Brewers Cup and World Beer Cup competitions. While tours and tastings are only offered at the end of each week, the brewery is open for retail sales all week. 135 N. College Ave.; 317/602-3702; www.sunkingbrewing.com.

With so much malt and hops abounding, it

makes sense that another city attraction aims to connect the thirsty masses with these beer venues. The bright green Indy Brew Bus, which can host 14 riders, offers a three-hour tour (\$30 per person) of three to four local breweries. Samples of house, seasonal and specialty beers are provided at each stop. And a personal sampling scorecard lets you and your friends (ages 21 or older, of course) rate your favorites.

"My husband and I started the business because a number of craft breweries were starting up in Indianapolis and there was not an easy, safe way to visit them all. We allow people the opportunity to taste great local beer and something that is uniquely Indianapolis," said Megan Bulla, who owns the tour bus with her husband, Andy.

In addition to Sun King, three other breweries are part of the tour, with about 45-minute stops at each. While the Brew Bus has limited tours during the Pumper & Cleaner Expo (more info at www.indybrewbus.com), all but the Bier Brewery and Taproom are located either a long walk or a short cab ride from the Indiana Convention Center.

- Flat 12 Bierworks is a craft production

LEFT: The bright green Indy Brew Bus is one way to visit several local microbreweries in one three-hour tour. Visit, taste and take in the ambience of what the city's brewing world is like — with a group of like-minded, beer-loving friends. RIGHT: Downtown visitors enjoy tasting the craft beers at Sun King Brewing Co.

brewery in the historic Holy Cross neighborhood. Sample their beers with most interesting names: Mustache Ride Red, Lacto-Matic Milk Stout, Upside Down Blonde and Liquid Fiction. 414 N. Dorman St.; 317/635-2337; <http://flat12.me>.

- Fountain Square Brewing Co. is located in the historic Fountain Square neighborhood. It started in 2011, born of the perfect storm of chemistry, microbiology, automation and a good old-fashioned love of the brew. Among their beers are Hop for Teacher, Backyard Porter, Preacher's Daughter Amber Ale and Workingman's Pilsner. 1301 Barth Ave.; 317/493-1410; www.fountainsquarebrewery.com.
- Bier Brewery and Taproom won the Indiana State Fair Champion Brewery Award in 2011 and 2012. One of the brewery's slogans is "come taste our awesomeness." Brews change frequently, and, like most microbreweries, the names don't disappoint, including Dirty Farmgal, Oranjunkle, Sanitarium, Wee Fatty and Billy Baroo. 5133 E. 65th St.; 317/253-2437; www.bierbrewery.com.

EXPO EATS: 10 TO TRY

By Judy Kneiszel

The Pumper & Cleaner Environmental Expo International does something to attendees and exhibitors ... it makes them hungry! Fortunately, there are numerous lunch and dinner options in Indianapolis within walking distance of the Indiana Convention Center and downtown hotels.

So check out the varied menus of these popular nearby eateries — featuring ethnic and popular local fare — then enter an address in your smartphone GPS and point your walking shoes down the street.

(Take note that price ranges are a per person estimate not including tax, tip or beverage.)

The Eagle's Nest at Hyatt Regency

1 S. Capitol Ave. / 317/632-1234 / www.indianapolis.hyatt.com

The Eagle's Nest, perched high atop the Hyatt Regency, slowly revolves, giving diners stunning views of the skyline. The menu, which changes seasonally, provides elegant and creative takes on classic American continental cuisine.

HOURS: 5-10 p.m. daily

PRICE RANGE: \$40-\$80

Menu sampling: Dry-aged, peppercorn-crusted, bone-in New York strip steak; pan-seared halibut with Parmesan potato gratin; lobster corn chowder; strawberry crème brulee.

Giorgio's Pizza

9 E. Market St. / 317/687-9869 / www.giorgiosindy.com

If you're in a hurry, you can grab pizza by the slice. If you've got more time, settle in for a whole pie in thin or thick crust style, some pasta or a calzone. And if you're too tired to go out, Giorgio's delivers for free with a \$10 minimum order.

HOURS: Mon.-Thurs. 9 a.m. to 9 p.m.; Fri. 9 a.m. to 10 p.m.; Sat. 11 a.m. to 10 p.m.

PRICE RANGE: Slices range from \$3-\$4; whole pies from \$10.95 for a 14" thin crust cheese to \$22.95 for a stuffed 16" large. Pasta dishes are \$6.45.

Menu sampling: Meatball Parmigianino hot sub; baked lasagna; pepperoni-filled bread sticks; Giorgio's chef salad with black olives and extra cheese; Sicilian cannoli.

Slippery Noodle Inn

372 S. Meridian St. / 317/631-6974 / www.slipperynoodle.com

Established in 1850, the Slippery Noodle is the oldest bar in Indiana, and has been called one of the nation's top blues bars by *Rolling Stone* magazine. The Noodle serves up a full menu as well as live blues seven days a week.

HOURS: Full menu available till 11 p.m. nightly; late night menu offered.

Opens daily at 11 a.m.

PRICE RANGE: \$8-\$20

Menu sampling: Shooter of shrimp; BBQ chicken quesadillas; whiskey pepper cheeseburger; filet mignon; Southern-style pork barbeque; chicken and broccoli Alfredo; toasted turkey sub.

(continued)



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EXPO EATS: 10 TO TRY *(continued)*

Scotty's Brewhouse Downtown

1 Virginia Ave. / 317/571-0808 / www.scottysbrewhouse.com

Scotty's is perfect if you're dining with a group that can't make up its collective mind about where to go. This huge casual restaurant and bar has an enormous menu, more than 70 beers and countless sports-playing TVs. For those with special dietary needs, there's a gluten-free menu and a low-calorie menu. For those less-restricted folks, there's the "big ass brewhouse burger," which comes with a T-shirt for \$36.

HOURS: Sun.-Thurs. 11 a.m. to 11 p.m.; Fri. and Sat. 11 a.m. to midnight

PRICE RANGE: \$7.50-\$20

Menu sampling: Dill chips (fried pickles); Brewhouse Buffalo wings; "Macho Nachos"; spicy sirloin steak sandwich; barbeque ribs; the "Shewman Special" half-pound burger with peanut butter, jalapenos, cheddar cheese and bacon; homemade soup of the day; mile-high grilled cheese; sweet chicken club wrap; homemade German chocolate cake.

Shapiro's Delicatessen

808 S. Meridian St. / 317/631-4041 / www.shapiros.com

Named one of the Top 10 delis in the country by USA Today, Shapiro's is a must for corned beef fans. Quick cafeteria-style service means more time to savor your sandwich, contemplate dessert from their full-service bakery or simply get back to the Expo!

HOURS: 6:30 a.m. to 8 p.m. daily

PRICE RANGE: \$5-\$14

Menu sampling: Sandwiches including Reuben, pastrami, and smoked turkey; matzo ball soup; cabbage borscht; Shapiro's bagels; stuffed cabbage; short ribs; stuffed peppers; potato pancakes; sour cream egg noodles; hot German potato salad.

Shula's Steak House at the Westin

50 S. Capitol Ave. / 317/231-3900 / www.donshula.com/

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Shula's combines steak and football in elegant, fine dining style. The restaurant is themed after the 1972 Miami Dolphins' "Perfect Season." The menus are even hand-painted on an official NFL game football.

HOURS: Open daily, 11:30 a.m. to 2 p.m. and 5 to 10:30 p.m.

PRICE RANGE: \$60-\$80

Menu sampling: French onion soup; jumbo lump crabcakes; prime rib; 22-ounce ribeye; roasted corn with bacon and shallots; truffle fries; molten lava chocolate cake.

Maxine's Chicken & Waffles

132 N. East St. / 317/423-3300 / www.maxineschicken.com

Home cooking is always on the menu at Maxine's, where their slogan is "A taste of love in every bite." This is a menu full of made-from-scratch comfort food.

HOURS: Tues. 10:30 a.m. to 2:30 p.m.; Wed.-Fri. 10:30 a.m. to 8:30 p.m.;

Sat. 9 a.m. to 8:30 p.m.; Sun. 9 a.m. to 6 p.m.

PRICE RANGE: \$5-\$15

Menu sampling: Jumbo fried chicken wings and waffle topped with peach butter; omelets with house potatoes; smothered chicken; catfish or tilapia with grits; half-pound burgers; fried green tomatoes; candied yams; black-eyed peas; seasonal cobbler.

Fast Burrito Mexican Grill

111 Monument Circle / 317/917-8090 / www.fastburritomexicangrill.com

If you need lunch in a hurry, but want something a bit healthier than a fast food burger, Fast Burrito offers fresh cuisine prepared using authentic Mexican recipes. Four salsas from mild to extra hot will add just the right kick.

HOURS: 7:30 a.m. to 3 p.m. daily

PRICE RANGE: Under \$10

Menu sampling: Burrito with choice of fillings; burrito bowl; grilled quesadilla; tacos; nachos; salad with chipotle ranch dressing. Fillings include marinated chicken, skirt steak, barbacoa (marinated beef brisket), ground sirloin, or sautéed peppers and onions.

Loughmiller's Pub & Eatery

301 W. Washington St. / 317/638-7380 / www.loughmillerspub.com

A patriotic décor welcomes diners to this casual, independently owned pub serving up an array of burgers, sandwiches and other traditional American favorites. Choose one of their 35 beers to wash down the hearty pub grub.

HOURS: 11 a.m. to midnight daily

PRICE RANGE: \$8-\$15

Menu sampling: Bacon and cheese fries; Southwest nachos; homemade chili; Indiana Cobb salad; Loughmiller's Little Cuban sandwich; pulled pork sandwich; English beef sandwich with cheddar and horseradish.

McCormick & Schmick Seafood Restaurant

110 N. Illinois St. / 317/631-9500 / www.mccormickandschmicks.com

Despite Indiana's distinct lack of ocean coastline, McCormick & Schmick provides 30 seafood choices daily in 80 different preparations, and staff members who can help you wade through the choices.

HOURS: Mon.-Thurs. 11 a.m. to 11 p.m.; Fri. 11 a.m. to midnight; Sat. noon to midnight; Sun. noon to 11 p.m.

PRICE RANGE: \$15-\$25

Menu sampling: Lump crab tower; buttermilk-fried oysters; lobster bisque; Romano chicken chop salad; horseradish-crusted steelhead; fish & chips; shrimp and Andouille mac and cheese; filet mignon; Kobe burger; pan-roasted wild mushrooms; tiramisu torte. ♦



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Collection system technicians Mark Correia, left, and John Melo perform maintenance on a drop shaft in Fall River, Mass. (Photography by Kevin Trimmer)

DECADES IN THE MAKING

Fall River's massive CSO abatement project has made a big impact on local water quality

By Jim Force

The problems facing many of our older Northeastern cities are widely known — population loss, economic woes, deteriorating infrastructure.

Fall River, Mass., has had its share of hard knocks, too. Once the nation's leading textile manufacturer, the city has lost industry and population. Nonetheless, the Fall River Sewer Commission is nearing completion of a decades-long, \$185 million combined sewer overflow abatement project that has already improved water quality

and promises to help the city prosper in the future.

"As difficult as this has been for us," says Terry Sullivan, administrator of community utilities, "all of the public referendums required for the various phases of the project passed by a pretty good margin (around 60 percent to 40 percent). The public has understood the need to comply with regulations and improve water quality. It's a good reflection on the city and our ability to move forward."

Even the steep topography and granite bedrock have helped. A

new 3-mile-long, 100-foot-deep storm-water storage tunnel needed hardly any liner because of its impervious granite walls, and the stored water drops by gravity 100 feet to the city's treatment facility, eliminating the need for pumping.

Fall River

Fall River lies on the eastern edge of Mount Hope Bay, which connects to the Atlantic Ocean, with much of the city built on steep hill-sides rising 150 to 200 feet above the water's edge. Its population has declined to around 90,000 from a

high of 120,000 in the 1920s, but it still ranks as the tenth largest urban center in Massachusetts.

The city's wastewater infrastructure includes one regional treatment plant and one satellite treatment facility; 179 miles of sewers (about 85 percent of them combined); 6,000 catch basins; 6,000 manholes; and 15 pumping stations.

The service area includes all of the city, as well as portions of several small abutting communities in Massachusetts and Rhode Island.

The sewer system dates back to 1857, and for many years, wastewater

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CSO supervisor Alan Levrault, right, looks on as Mark Correia, left, and John Melo use the Vactor truck to suction screening debris that was captured by the CSO screen during a rain event.

ter and stormwater was simply diverted into the bay. The first wastewater treatment plant was commissioned in 1948. A 60-inch interceptor ran along the shore of the bay, directing dry-weather flow to the treatment plant, but releasing stormwater and diluted sewage over a number of weirs to the bay when rainfall amounts became too much to handle.

The treatment plant was upgraded to secondary treatment in the early '80s, and the major pump stations were also updated.

These improvements were not enough to prevent a third-party lawsuit from the Conservation Law Foundation, however, and in 1984, the city embarked on a comprehensive, long-term CSO plan that continues today. In fact, Sullivan has spent his entire



PROFILE: City of Fall River, Mass., Sewer Commission

FOUNDED:
1975

SERVICE AREA:
City of Fall River, plus portions of Westport, Freetown, and Tiverton, R.I.

POPULATION SERVED:
88,000 in the City of Fall River plus another 2,000 outside the city

INFRASTRUCTURE:
179 miles of sewers (85 percent combined); 6,000 catch basins; 6,000 manholes; 3 miles of CSO storage tunnel with 9 drop shafts; 15 pumping stations; 1 regional wastewater treatment facility; 1 satellite treatment facility

EMPLOYEES:
12 in collections;
38 in operations

ANNUAL OPERATING BUDGET:
\$19.7 million

WEBSITE:
www.fallriverma.org



professional career at Fall River dealing with the project, which is expected to continue until 2018, when final construction is expected to be complete. It has literally been his life's work.

"Overall, our CSO project is designed to address 19 CSOs throughout our system," explains Sullivan. "To date, we've spent about \$165 million of the \$185 million budgeted, and managed all but three of the overflows."

Funding has come from federal grants, the Massachusetts State Revolving Loan Fund, and sizeable rate increases.

Phased approach

After the planning phase, completed in the late 1980s and costing about \$10 million, Phase 1 of the construction made improvements to the Fall River regional wastewater treatment plant. Capacity was expanded from 50 to 110 mgd, and the treatment works received multiple equipment improvements to manage the increased flow. These included new Flygt pumps to transport the influent from the existing interceptor, new Vulcan bar screens, level control by Siemens, VFDs by Square D (Schneider Electric) and electrical panels by GE. In the new design, the first 50 mgd receives full secondary treatment, with any excess flow passing through the headworks, primary treatment and disinfection before it is discharged to Mount Hope Bay.

In 2007, the plant won the National Association of Clean Water

INSPECTION AND CLEANING

Fall River has contracted with Veolia Water North America for the operation and maintenance of its treatment plant and collections system. Using city-owned Vactor sewer cleaning units and Stetco hydraulic clamshell cleaners, crews flush and clean 38 miles of sewer a year, rebuild or repair 50 catch basins a year, and clean 1,800 catch basins a year. "We get a lot of leaves in our basins," explains Terry Sullivan, administrator of community utilities.

Other than that, the crews concentrate on the trouble spots. "We know where we are prone to flooding, and we routinely attend to those areas," says Sullivan. "We can bring in extra staff if necessary to respond to flooding."

"We're in the second half of a 10-year contract (2004-2014)," he adds. "Veolia operates three shifts 24/7, and has 38 employees devoted to the treatment plant and 15 lift stations, and 12 to collections. We're currently expanding the scope of the agreement to include 600 video manhole inspections a year uploadable into an InfoNet database."

Developed by Innovyze, InfoNet is a purpose-built underground-infrastructure management software program used by Veolia Water to maintain and manage all sewer and stormwater collection system and water distribution data. All infrastructure assets (manholes, catch basins, pipes, etc.) are contained within the database and easily accessed by management via the GIS viewer.

"The real benefit to InfoNet is the specific functionality of linking all preventive maintenance tasks, repairs and environmental events to the exact related asset," Sullivan says.

"This allows the Veolia Water management team to make more informed operations and maintenance decisions and easily assist the city with environmental compliance reporting. It's transformed an operation from paper work orders to the field crews using an electronic tablet device containing their specific work orders to be completed as the work is performed and uploaded daily to the master database for management to review."

Sullivan adds that a staff specialist is currently adding the new storm-water containment and treatment systems to the utility's GIS system.

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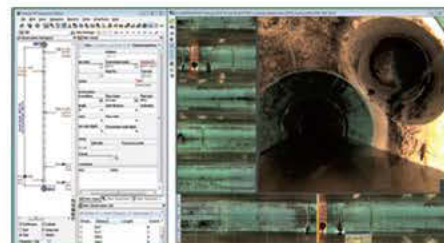


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Administrator of community utilities Terry Sullivan, left, and CSO supervisor Alan Levrault check the Flygt dry-weather pumps (Xylem) for normal operation at the pump station.

Agencies' Peak Performance Silver Award, as well as the EPA's Operation and Maintenance Award for Region 1 (New England) and the Excellence Award from the Massachusetts Water Pollution Control Association.

Deep tunnel

In Phase 2, a 3-mile-long, 20-foot-diameter stormwater storage tunnel — capable of holding 38 million gallons — was bored 100 feet underground. Nine dropshaft diversion structures can allow the combined sewerage to be directed to the tunnel or to the existing interceptors as needed, Sullivan explains. The tunnel acts as both a dry-weather interceptor and a CSO conveyance/storage tunnel. Water stored in the tunnel flows by gravity to the treatment plant.

While the drilling of the deep tunnel caused much less surface disruption than sewer separation, some homeowners noticed as the 700-foot-long tunnel boring machine, manufactured by The Robbins Company, ate its way through the rock beneath their property. The machine had a 20-foot-diameter cutting head with dozens of "cutters" that pulverized the rock into gravel-sized pieces. These pieces were diverted to conveyors and ultimately to railcars that carried the rock to the surface for re-use as gravel.

"I got several calls from residents telling me they noticed something different in their basements, and wondered if it was their boiler," Sullivan says.

The tunnel and the first four dropshafts became operational in 2005. "On a normal day-to-day basis,



The Fall River CSO team includes, from left, John Melo, Terry Sullivan, Mark Correia and Alan Levrault.

(12 mgd), which was equipped with self-cleaning rotating drum screens (Vulcan) and disinfection capabilities to create an independent satellite treatment station. Disinfection is achieved through the use of liquid chlorine. The dry-weather pumps at both stations and the wet-weather pumps at Cove Street were all supplied by Flygt. The emergency generators were

screen and chlorination steps, up to 54 mgd of storm flow is treated before it's discharged to the outfall. Sullivan explains that the chlorine residual dissipates significantly before the treated water reaches the discharge point.

These steps have effectively addressed 16 of the 19 CSO points in the Fall River system. Sullivan says the three remaining CSOs are being remedied now, with satellite treatment planned for Alton Street, City Pier and President Avenue. "Right now, we're reanalyzing Alton Street and City Pier, comparing the cost of separation against screening and disinfection," explains Sullivan.

The final phase of the Fall River project is scheduled to take place in 2015-2018, and will include additional sewer separation and green solutions to stormwater in the south end of the collections system.

Costs and benefits

A national news story last fall reported significant water and wastewater rate increases around the United States. It didn't include Fall River in its examples, but it could have. "Our CSO project has had a severe impact on our cus-

"As difficult as this has been for us, all of the public referendums required for the various phases of the project passed by a pretty good margin (around 60 percent to 40 percent). The public has understood the need to comply with regulations and improve water quality. It's a good reflection on the city and our ability to move forward."

Terry Sullivan

The structure, drilled through the extremely hard granite bedrock that underlies Fall River, cost \$78 million and took five years to complete. The rock proved advantageous, however, in that the interior surfaces of the tunnel are so smooth and impermeable, no liner was required except for one small area — a cost savings of \$15 million to \$20 million, Sullivan estimates. A ventilation shaft at the end of the tunnel allows for positive displacement of the air.

we handle about 20 million gallons at the treatment plant," says Sullivan. "During heavy rains, we can manage up to 110 million gallons, and beyond that, we can store up to 38 million gallons in the tunnel. We're designed for the maximum three-month storm, which we classify as 1.76 inches of rain in any 12-hour period."

Also in the second phase, two of the utility's largest pump stations were upgraded — Central Street (15 mgd) and Cove Street

made by Caterpillar, and the rag washer at Central Street was made by Waste Tech (Kusters Water).

Sullivan says the satellite treatment system — started up in 2009 — is working very well.

"Before, dry-weather flow would come through the Cove Street station and pass to the treatment plant, but during wet weather, excess flow would go over the weir and into the river," he explains. Now, through the addition of large impeller pumps, smaller feed pumps, and the fine

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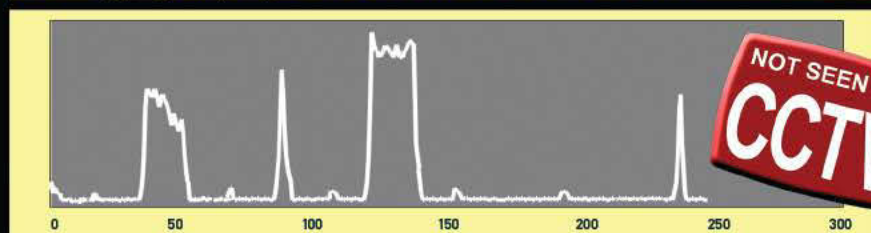
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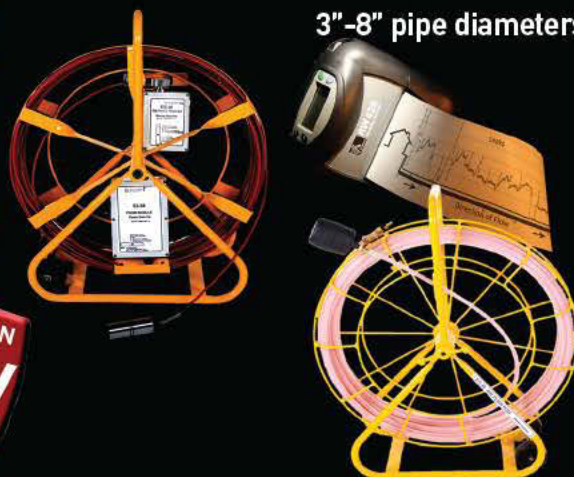


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tomers," says Sullivan. "The rate increases are up as much as 400 percent," he says, explaining that the sewer user fee was at 96 cents per 100 cubic feet before the project, and is now \$4.09. In addition, the city has imposed a stormwater fee on all customers — smaller for residential users, who pay \$140 annually, and larger for developments like shopping malls with large parking lots, which pay \$140 per 2,800 square feet of impervious surface on their property.

"We've had no choice," Sullivan says, pointing out that the city's debt service on the water and wastewater improvements is significant in and of itself. "Forty-five percent of our sewer and stormwater budget is for debt service, and 33 percent of our water budget is for debt service."

In terms of dollars and cents, the average water-sewer bill in Fall River has risen from about \$150 a year to around \$900 a year.

The loss of manufacturing added to the expense, because the mills were large-volume water users, paying a lot in water and sewer fees.

Still, Sullivan points out that

the public has supported all three referenda on the CSO project. "I think the public has understood the need to comply with the lawsuit and improve the water quality in the bay," he says. "We're replacing sewers and water mains from the 1800s. We've done our best to minimize the rate increases. We're not alone, and it's not a luxury for us, but it's a good reflection on our city and our willingness to move forward. From a water quality perspective, these are good goals to have."

Results

Perhaps the best thing that's happened is the improvement in water quality; it's significant and visible. "I frequently stroll along the walkway that lines the bay, and I can see the difference," says Sullivan. "Twenty years ago, you probably couldn't see more than 3 inches down into the water. Today, you can see 6 to 10 feet. It's crystal clear."

The shoreline itself is a pleasure to look at as well, with Veteran's Memorial Bicentennial Park and a small replica of the Iwo Jima U.S. Marine Corps monument. Sullivan says the old manufactur-

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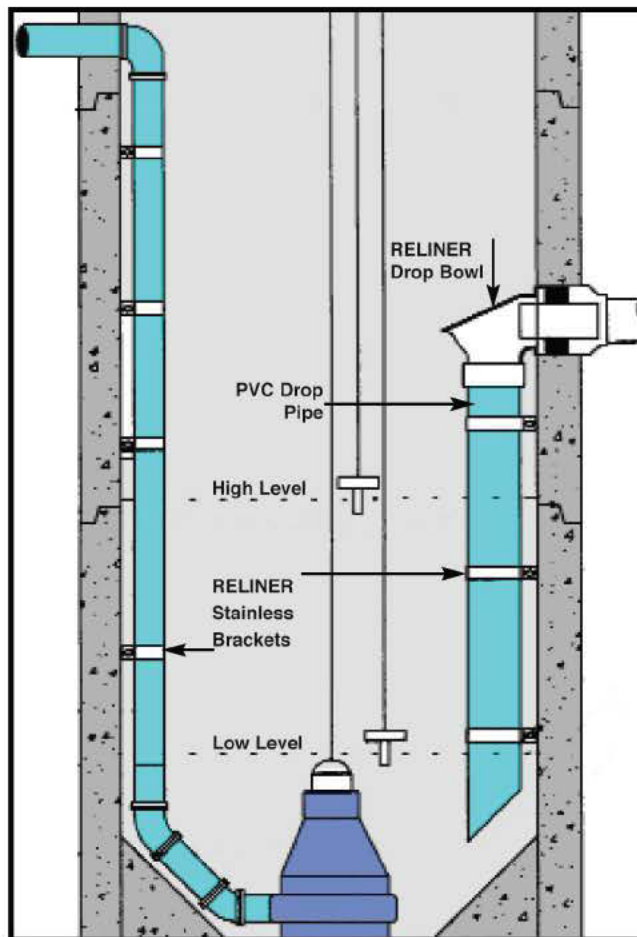
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ing area is being improved, with restaurants, tennis courts and shops along the waterfront.

And clean water has more than an aesthetic value. Sullivan explains that because of fecal coliform counts, former shellfishing areas in the


bay were shut down many years ago. But now they're coming back. "Both were opened conditionally a year or two ago," he says. "The state Department of Fisheries is extremely pleased with the water quality improvements here." ♦




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TIER 4 WITHOUT TEARS

By 2015 all new off-road diesel equipment will be Tier 4 compliant, requiring additional maintenance considerations

By Peter Kenter

Final Tier 4 (FT4) diesel engines standards have already been implemented for newly manufactured on-road vehicles with the 2010 EPA emission regulations, but the switch has just begun for off-road vehicles. Off-road diesel owners need to understand the specific maintenance needs of these engines, and where state or local end-user regulations may require them to use Tier 4 equipment.

designed to mirror those of the U.S. EPA, but at slightly later implementation dates.

However, John Deere Construction and Forestry Division Engine/Drivetrain product marketing manager Joe Mastanduno notes that while the EPA regulations for manufacturers don't apply to owners and operators, they still need to be aware of federal, state and local regulations that apply to end-users.

"The EPA has identified areas

"We're seeing individual counties and municipalities specifying what sort of diesel engines can be used in their jurisdictions, sometimes with a penalty for using older equipment that doesn't reflect what's available. Jurisdictions such as Chicago, New York City, Vancouver and Massachusetts are already advancing end-user regulations that mirror the availability of new equipment."

Joe Mastanduno

Manufacturers must meet the EPA's FT4 requirements according to engine horsepower range. Standards for off-road vehicles with engines of 25 to 74 hp were implemented in January 2013, and 75 to 749 hp beginning January 2014 and concluding in January 2015. Canadian regulations are

of non-attainment for ground level ozone and particulates," he says. "Counties and municipalities that are in non-attainment areas are enforcing their own regulations that cover diesel equipment in order to meet EPA standards. We're seeing individual counties and municipalities specifying what

sort of diesel engines can be used in their jurisdictions, sometimes with a penalty for using older equipment that doesn't reflect what's available. Jurisdictions such as Chicago, New York City, Vancouver and Massachusetts are already advancing end-user regulations that mirror

more areas falling into the non-attainment category.

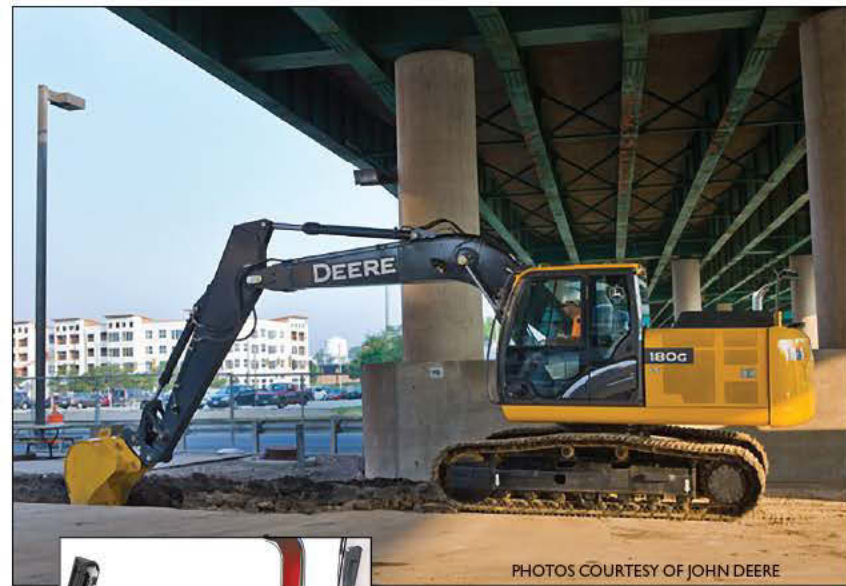
Interim Tier 4 roll-out complete

The final roll-out of current Interim Tier 4 (IT4) engines of all horsepower ranges was completed in January 2012 although existing dealer stock of older engine models continues to enter the market.

For those who are still anticipating IT4 equipment, the biggest changes involve the types of fluids required by the new engines. IT4 engines use only ultra-low sulfur diesel (ULSD). The oils used must be low-ash CJ-4 oils. All coolants and additives should be pre-approved to work with a specific engine.

Mastanduno notes that the EPA diesel rules are outcome-based, so John Deere's approach to meeting regulatory requirements reflects its own technological choices. However, the approach taken by many other equipment

(continued)



PHOTOS COURTESY OF JOHN DEERE



Standards for off-road vehicles with engines of 25 to 74 hp were implemented in January 2013, and 75 to 749 hp beginning January 2014 and concluding in January 2015. Canadian regulations are designed to mirror those of the U.S. EPA, but at slightly later implementation dates.

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suppliers represents the use of similar technology.

The heart of the changes to the IT4 engine is the exhaust filter which consists of a diesel oxidation catalyst (DOC) and a diesel particulate filter (DPF). The exhaust filter is designed to react with exhaust gases to reduce carbon monoxide, hydrocarbons and some particulate matter. While the DOC requires no user maintenance, the DPF must be replaced at minimum intervals defined by the EPA.

"The DPF cycles through a self-activating cleaning process called passive regeneration that uses exhaust heat produced during normal operating conditions," says Mastanduno. "In redesigning the engines, we focused a lot on the tolerance of the parts such as the clearance on piston rings and we were able to reduce oil burning to about one-tenth of what it used to be. However, because of ash created by burning lube oil in the diesel, it still requires the minimum service interval set by the EPA."

Servicing diesel particulate filters

The ceramic filter must be changed at a minimum interval of 4,500 hours for engines at or above 175 hp and a minimum interval of 3,000 hours for engines rated below 175 hp. Delaying that suggested maintenance schedule indefinitely will eventually cause the engine to shut off. Operators will have plenty of warning, however. One unique aspect of John Deere technology is the use of condition-based monitoring that alerts the user when the DPF needs to be exchanged.

"A filter restriction bar on the control panel will show you that the exhaust filter is approaching the end of its service life," says Mastanduno. "A bar will turn to green, yellow and eventually to red as the filter goes into a high restriction state that gradually powers down the engine. These warnings aren't only visible to the operator — they can be sent remotely to desktop computers, forwarded by email, or sent to a smartphone."

That same wireless link can be used to upgrade engine firmware or run diagnostic checks using a connection established between

dealer and operator on specially equipped John Deere models.

Mastanduno notes that dealer servicing is the best course of action for the ceramic filters. There are no generic filters or filters that are interchangeable between the various manufacturers of construction equipment.

"We also saw the emergence of mobile filter cleaning services, particularly in California, that prom-

like a ceramic vase, rendering it irreparable.

Reducing nitrous oxide

The newest FT4 compliant engines, however, need to deal with the results of all of the changes to the engines made in IT4.

"A traditional diesel engine can't reduce carbon monoxide, hydrocarbons and particulates to the levels required by the EPA without

of diesel exhaust fluid (DEF) in a separate tank. The fluid is injected into the exhaust stream to help reduce NOx, converting it again to nitrogen and water. Although we've seen DEF offered more and more widely, we recommend that the tank be topped up at the same time as the diesel tank is filled. You don't want to be working out in the middle of nowhere and run out of DEF."

Operators of IT4 and FT4 equipment should see little change in day-to-day operations, other than the addition of new dashboard engine monitors. However, Mastanduno says that maintenance shop staff will find engine components more tightly packed inside the engine compartment.

"As you oversize some components to create cleaner exhaust, and add other catalytic components, you eventually run out of room," he says. "To get the heads off most of the engines will now require you to remove the DPF prior to starting work."

Mastanduno notes John Deere continues to offer compact excavators that are not subject to IT4 or FT4 requirements. "If you can bring the machines down below the horsepower breakpoints, they are subject to different emission regulations," he says. "By using different machine integration techniques, we've been able to take some excavators that serve this market down below the power band breakpoint and have avoided the requirement to add DPFs to these machines." ♦

TIER 4 DIESEL — THE RETROFIT ROUTE

In areas where end-user regulations have pushed operators to adopt Interim Tier 4 (IT4) and Final Tier 4 (FT4) technology, some operators have opted to take the retrofit route, rather than buying OEM machines.

"It was possible to add a diesel particulate filter (DPF) on existing Tier 2 and Tier 3 machines, but in California we were getting anecdotal information of diesel filters being slapped onto the top of the hood and affecting operator visibility," says Joe Mastanduno with the John Deere Construction and Forestry Division. "Operator safety was one of the reasons that California slowed down end-user requirements in that state and gave operators a four-year break on adopting the new technology."

However, reducing particulate matter with retrofit DPFs has proven difficult. With retrofit DPFs, for example, the DPF computer often fails to communicate with the engine computer.

"We've been in development with a supplier to provide retrofit DPF support in the form of a complete Tier 4 retrofit package and even with considerable research and development, it's proved to be very challenging," says Mastanduno. "While the technology of the components is well understood, you need to be able to guarantee that they are all seamlessly integrated and work as a complete system. Attempting that at the shop level and achieving local end-user regulations would present a huge challenge."

used to clean them out on the spot," he says. "They would install the cleaning equipment in vans and then drive to the site for service, but reports suggest that the filters were able to operate effectively for perhaps 250 to 500 hours instead of the 1,000 hours that was typically promised."

When dealer-serviced, the filter can be exchanged and the operator is given a core charge for the filter core, which can be cleaned through an exacting process involving pressurized air and high temperature baking. The filter must be handled carefully if removed by the operator — dropping it on the floor even from a low height will cause it to crack

creating nitrous oxide (NOx)," says Mastanduno. "They have different properties and as one decreases, the other increases. A more complete burn of the diesel creates more NOx in the exhaust, while a cooler burn creates less NOx, but more particulate matter. FT4 is designed to deal with the NOx created in the previous round of changes as a separate stream."

The reduction in NOx is achieved through selective catalytic reduction (SCR), a process that uses a surface coated with precious metals to convert NOx to nitrogen and water.

"It's a catalytic process, so there isn't anything replaceable inside the unit," says Mastanduno. "However, the process requires the use

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DRIVEN BY DATA

South Bend is proving that low-cost flow monitoring technology and cloud-based software can trump high-cost infrastructure expansion

By Peter Kenter

The City of South Bend, Ind., is turning to an array of sophisticated sensors, among other technological innovations, to expand the capacity of its storm and sanitary sewer systems and make existing infrastructure more efficient.

Several years ago, South Bend's biggest challenge involved combined sewer overflows. On average, more than 2 billion gallons of untreated sewage was discharged into the St. Joseph River during 80 events per year.

ing the century mark, while reinforced concrete, ductile iron or cast iron are heading for 50.

South Bend examined a number of options to control CSOs, including sewer separation and the construction of large storage tanks that would allow the wastewater plant to treat excess water over several days.

"However, what caught our eye was research we saw at Notre Dame in 2005 that used embedded sensors to conduct real-time monitoring and control of wastewater and stormwater," says Gilot.

"We knew that in a lot of organizations, data collected from a water or wastewater system is siloed. We wanted to free that data to do as much work as it could and help South Bend become a data-driven city."

Carey Hidaka

"This is not just a problem faced by South Bend, but by hundreds of cities across the country," says Gary Gilot, P.E., president of the South Bend Board of Public Works and consultant with the city's Public Works Department.

Portions of the sewer and stormwater system are showing their age. Some clay tile pipes are approach-

Embedded sensor array

Developed by engineers and scientists at Notre Dame and Purdue universities, the system employs a series of embedded sensors coupled with battery-powered, credit-card-sized computers. The sensors use mixed 900 MHz cellular service to transmit data every five minutes.

"I saw a bench-scale hydraulic



Assistant South Bend city engineer Patrick Henthorn, left, CSO operations manager Rick Smigielski, CSO inspector Bryan Kirkendoll and CSO representative Brett Miller (in pit) check a CSO sensor at a river crossing and gateway in Leeper Park. (Photography by Cathy Dietz)

(continued)

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model in the laboratory and Michael Levine, a professor at the Department of Statistics at Purdue, had taught it to make decisions based on an economic model,” says Gilot. “It would route the stormwater from each simulated storm at the lowest price, with a low price associated with water being sent to stormwater basins, and higher prices for water going into the river or someone’s basement.”

EmNet, a startup company formed by Notre Dame graduate students, developed and marketed the sensor network as CSO.Net. The city began to install the system in mid-winter 2008. EmNet reports that, as of the beginning of 2013, it had supplied 117 manhole cover-mounted sensors at CSO outfalls, interceptors, trunk lines and retention basins at a total cost of about \$3 million.

The city already employed a SCADA system that monitored the system at 17 locations — primarily lift stations — using Rockwell Automation’s RSView software.

The missing element was a system that could crunch all of the data, present it to Public Works staff in a usable form,



PROFILE: Public Works Department, South Bend, Ind.

ESTABLISHED:
1865

POPULATION SERVED:
120,000

AREA SERVED:
42 square miles

DEPARTMENT STAFF:
189

INFRASTRUCTURE:
545 miles of water mains,
550 miles of sewer lines

**ANNUAL DEPARTMENT
BUDGET:**
Sewer and wastewater —
\$30.4 million (2012); water
— \$9.1 million (2012)

ASSOCIATIONS:
American Water Works
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WEBSITE:
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EmNet senior project manager Tim Ruggaber checks a LogiCover real-time monitoring device (EmNet).

and then translate that information into instructions that would achieve the department’s operational goals.

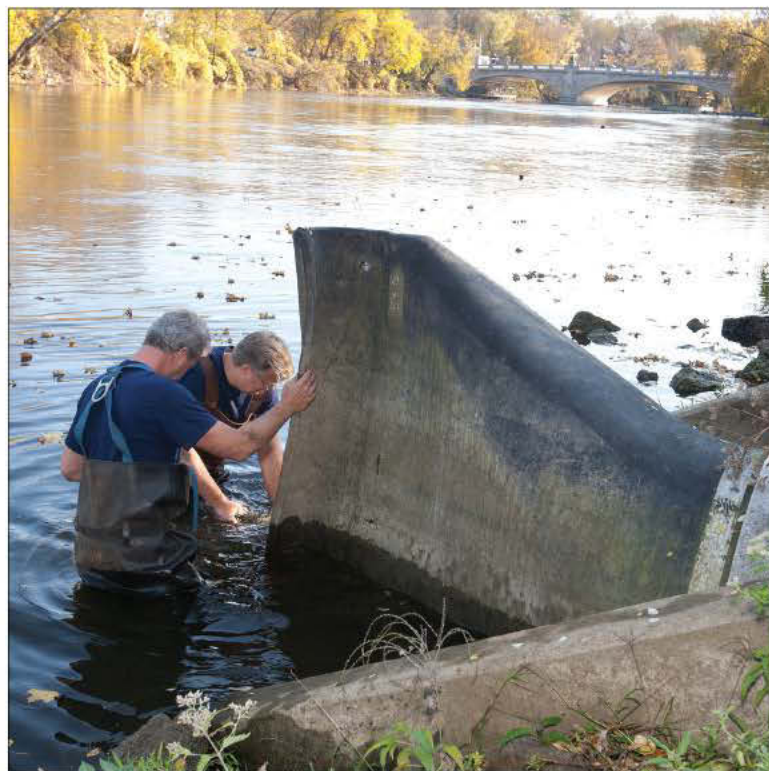
Enter IBM’s Intelligent Operations Center (IOC) for Smarter Cities.

“We were working with EmNet and they introduced us to Gary Gilot and Patrick Henthorn, South Bend’s assistant city engineer,” says Carey Hidaka, a public sector business solutions professional with IBM Global Business Services. “We knew that in a lot of organizations, data collected from a water or wastewater system is siloed. We wanted to free that data to do as much work as it could and help South Bend become a data-driven city.”

The computer-screen dashboard developed by IBM provides a color-coded representation of the system in real time, allowing staff to focus infrastructure resources to control impacts on the receiving stream. Similar to a traffic light, green is good, yellow means caution and red indicates an emergency.

The system also incorporated other readily available information from sources as diverse as the National Weather Service, the U.S. Geological Survey and the Na-

Brett Miller, left, and Rick Smigielski check a TideFlex duckbill check valve (RedValve) in Leeper Park.



CSO CREW REINVENTS ITSELF

When the City of South Bend instituted a series of computer-automated controls to curb combined sewer overflows, South Bend Board of Public Works president Gary Gilot challenged two former CSO crew members to reinvent themselves after the automated system took over most of their functions.

“They took up that challenge by looking at the 36 outfalls into the St. Joseph River,” says Gilot. “These are large-diameter, metal one-way valves that get stuff stuck in them and need to be greased and exercised so they swing freely, then reseated when river pressure lets up.”

The crew replaced the valves with rubber In-Line Duckbill Check Valves supplied by Tideflex.

“We have a nameplate dry-weather capacity of 48 mgd,” says Gilot. “I let them know that in addition to the 10 mgd capacity we have for economic development, they added another 3 mgd to the reserve capacity. That reserve capacity can be the difference between being in the game for attracting an industry that uses a lot of water, or losing it to a more-competitive city — and these guys did all of the heavy lifting.”

tional Oceanic and Atmospheric Administration.

A cloud system first

Once developed, IBM moved the entire system to SmartCloud, its cloud-based service. That strategy eliminates the capital cost of IT infrastructure, and allows the city to pay for the service from its

operational budget. It also allows the data collected to be used by any authorized city employee.

“To the best of our knowledge, this is the first time a wastewater collection utility has hosted its monitoring system on a cloud service,” says Hidaka.

As the system was built, the department looked at its system

(continued)



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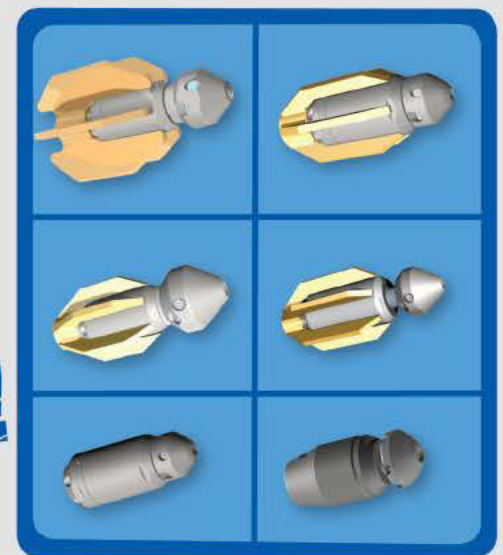
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with a fresh perspective.

"It used to be considered a reasonable assumption for any system that rainfall was uniform," says Gilot. "But between the sensors and radio-enabled rain gauges, we were able to demonstrate that we might be experiencing a drizzle on the east end of town and a downpour on the west. We also know the exact daytime flows versus the higher morning and evening peak flows when people are home. Knowing this information, the sensors can talk to each other and to the department's SCADA system, as smart valves direct excess flows to parts of the system that are most capable of accommodating the extra volumes. This is such a far cry from the old days when we'd have two guys who were CSO inspectors flipping sewer lids until they discovered the problem."

The genius of the system is its ability to capture new information, such as basement flooding reports, and display them in such a way as to direct the department to action. A basement flooding "heat map," for example, shows hot spots where more incidents of basement flooding have been reported, directing repair and maintenance crews to expend more effort there.

"The IBM Intelligent Operations Center for Smarter Cities is agnostic," says Gilot. "It can take data from CAD drawings, treatment plant rain gauges, sewer sensors and anything else we care to feed it and boil it down to useful information that allows us to make decisions at a glance."

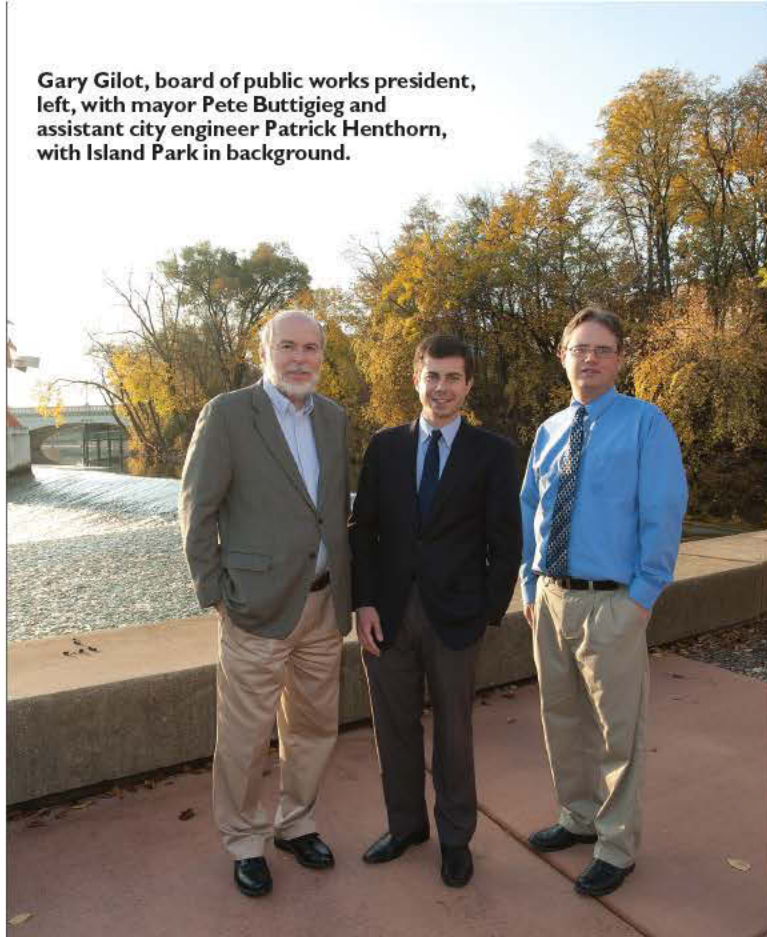
The system can also work to prevent any accidental overflows resulting from routine procedures such as flushing hydrants.

"Imagine you're in a storm and your water utility picks that time to backwash its filters on schedule," says Gilot. "That data is now part of the overall system, and the logic linkage can override that backwash procedure until the storm is cleared, allowing us to avoid shooting ourselves in the foot."

An IBM super-computer was also used to run years worth of rainfall and combined sewer overflow simulations to determine which methods could be used to reduce CSOs at the lowest cost.

"It turns out that planting native plant species with deep roots helps

Gary Gilot, board of public works president, left, with mayor Pete Buttigieg and assistant city engineer Patrick Henthorn, with Island Park in background.



"We've got to think of rainwater as a resource to recharge the aquifer and not something we've got to shunt away from the city."

Gary Gilot

to draw rainwater into the aquifer for far less money than big pipes," says Gilot. "We've got to think of rainwater as a resource to recharge the aquifer and not something we've got to shunt away from the city."

However, no matter how much computer power is thrown at the system, the conscientious efforts of department staff and crews remain essential to reaching and maintaining optimal system efficiency.

A CUES van provides crews with CCTV support while five Vac-Con and Vac-Con sewer cleaning units clean catch basins yearly and the entire system every four years. The city is looking at purchasing a sixth, smaller unit that is more maneuverable in tight locations.

Crews more efficient

"Instead of sticking primarily to a routine pattern, they're accessing the data system to see how well they're performing in real time," says Gilot. "If they see an area that needs attention after a storm, they move their crews to that area to

remove grit and debris first. This is something they're doing on their own initiative."

Using the new system has made the department so efficient that existing crews now devote 50 extra days per year to clean sewers, clean 2,000 additional catch basins annually, and have increased the number of sewer inspections at non-routine locations by 175 percent.

The Environmental Protection Agency and South Bend agreed to a consent decree in December 2011. Under that agreement, the city will invest more than \$500 million over 20 years to reduce CSOs by 95 percent.

"We essentially told the EPA that we believe we've developed a better mousetrap that will save our ratepayers money," says Gilot. "The EPA was open to our idea with the proviso that if we couldn't make our case, we were back to Plan B, spending more than \$500 million on a storage solution."

However, the current steps taken by the city to address CSOs have

already made significant strides toward those goals. Wet-weather overflows have been reduced by 23 percent and dry-weather overflows have been reduced from 27 occurrences to one in the system's first full year of operation. By mid-2012, it was estimated that simply using existing infrastructure in a more efficient way has helped the city avoid more than \$600,000 in potential government fines while potentially offsetting more than \$100 million in capital infrastructure cost.

The system is already helping to transform South Bend into the data-driven city it aims to be. Solid waste trucks, for example, are now being fitted with Wi-Fi devices to collect water meter data. Police can access a list of properties that no longer have water service and flag those as abandoned nuisance properties that may attract crime.

South Bend mayor Pete Buttigieg says he routinely boasts about the city's advanced wastewater treatment system when promoting the community.

"The wastewater system is one of the most technologically advanced in the country," says Buttigieg. "Of course I want to tell people about it. It's part of the leading edge of development that's transforming South Bend into a digital city." ♦

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EDUCATION DAY SEMINARS

MONDAY
FEBRUARY 25TH

NAWT

National Association of Wastewater Technicians

- 8 a.m. Introduction to Pressure Distribution
- 9:30 a.m. Designing Systems, Boundaries and Barriers from a Soils Perspective
- 11 a.m. Pump Choices and Settings: Decisions for Proper Operation
- 1:30 p.m. Operation and Maintenance of Pressure Distribution Laterals
- 3 p.m. Installing with Management in Mind: How to Get the Most out of Your System
- 4:30 p.m. Design and Maintenance of Grease Interceptors

NEHA

National Environmental Health Association

- 8 a.m. What Makes a Professional in Onsite Wastewater Systems?
- 9:30 a.m. Part One: The Science and Engineering of Onsite Wastewater Treatment
- 11 a.m. Part Two: The Science and Engineering of Onsite Wastewater Treatment
- 1:30 p.m. Education and Training: Professionalization of the Practitioners
- 3 p.m. Management Models: Management and Becoming a Management Entity
- 4:30 p.m. The Future of the Onsite Wastewater Industry: How to Make it Work for You!

SSCSC

Southern Section Collection Systems Committee

- 8 a.m. Seven Powerful Tools for CCTV Inspection Perfection
- 9:30 a.m. Easements — A Collection System Maintenance Nightmare
- 11 a.m. Nozzle Science — The Next Generation of Tier 3 Nozzles and Beyond
- 1:30 p.m. Pass or Fail — Is Your Company Going To Make It? How to Ensure Success
- 3 p.m. Social Media and Web-Based Promotion: Is it Right for Your Business?
- 4:30 p.m. Pipeline Relining and Rehabilitation Solutions

NASSCO

National Association of Sewer Service Companies

- 8 a.m. Ultraviolet Manhole Rehabilitation
- 9:30 a.m. Convey Your Stormwater and Plug Your Holes!
- 11 a.m. Jet Up! Sewer and Storm Water Cleaning
- 1:30 p.m. Rethinking Collection Maintenance with Sewer Line Rapid Assessment Tool or SL-RAT
- 3 p.m. Case Study of Cleaning Large Diameter Sanitary Sewers and Siphons
- 4:30 p.m. Pipeline Assessment Certification Program (PACP) 2013 Update Workshop

NOWRA

National Onsite Wastewater Recycling Association

- 8 a.m. Time Dosing ... Why? How? And How Much?
- 9:30 a.m. Loading Rates — How Much Can the Soil Take?
- 11 a.m. Troubleshooting Pumps, Floats and Panels
- 1:30 p.m. The Dirty Dozen — Toxins That Kill Septics
- 3 p.m. How Installers Can Use the Poor Economy to Increase Profits
- 4:30 p.m. Are Seepage Pits Really Bad?
- 8 a.m. Designing Drip Dispersal Systems
- 9:30 a.m. Soil Erosion Control During and After Septic System Installation
- 11 a.m. Decentralized Wastewater Collection System Maintenance

NOWRA Room 2

SCOTT HUNTER

Business Coach

- 8 a.m. - 5:30 p.m. | 2013 - Your Best Year Ever

WJTA/IMCA

WaterJet Technology Association

- 8 a.m. Safety and Efficiency — You Don't Have to Choose!
- 9:30 a.m. Selecting the Best Jetting Tip Doesn't Have to Be Scary
- 11 a.m. Hydroexcavation — The Non-Destructive Solution

PHIL STEIN

Vacuum System Information

- 1:30 p.m. | Understanding the Power: Physics of Vacuum and How it Works

NEXSTAR

Independent Residential Service Contractors Association

- 1:30 p.m. | The Art and Science of Business Management
- 3 p.m. | The Business of Contracting

PSAI

Portable Sanitation Association International

- 4:30 p.m. | GAP: Good Agricultural Practices



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FEBRUARY 25-28, 2013

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TUESDAY TRACKS

FEBRUARY 26TH, 2013

TRANSPORTATION AND LAND APPLICATION

- 8 a.m. Driver Compliance and Certification: How to Meet DOT Requirements
- 9:30 a.m. Staying in Compliance with 503 Regulations for Land Application
- 11 a.m. Land Application: Case Study of a Long-Term Operation

INDUSTRY SAFETY

- 8 a.m. One Piece Nozzles Enhance Performance and Safety
- 9:30 a.m. Confined Space Entry Permit and Equipment Review
- 11 a.m. Utility Line Locating

SSCSC

- 8 a.m. Making Emergency Response Your Business
- 9:30 a.m. How to Protect and Maintain Sewer Hose From Mini Jetters to Combination Units
- 11 a.m. How to be Successful in the Cleaning/CCTV Business

GENERAL BUSINESS

- 8 a.m. New Untapped Techniques to Capture Today's Customers
- 9:30 a.m. 10 Steps to Marketing Success
- 11 a.m. Cloud Computing for Small Business and the Field Service Industry
- 8 a.m. Don't Win the Price Game
- 9:30 a.m. Make the Phone Ring with Low-Cost Marketing
- 11 a.m. Local Marketing on the World Wide Web

Business Room 2

SEWER COLLECTION & REHABILITATION

- 8 a.m. Chemical Grouts and Grouting Methods
- 9:30 a.m. Watch Your Assets — Remote Monitoring Can Save You Big Bucks
- 11 a.m. Lateral Connection Rehabilitation: Biggest Bang for the Rehabilitation Buck

SPANISH/ESPAÑOL

- 8 a.m. Floods in Mexico City
- 9:30 a.m. Best Practices for Working in Confined Spaces
- 11 a.m. How to Overcome the Difficulties of Doing Business in South America

WEDNESDAY TRACKS

FEBRUARY 27TH, 2013

SEWER COLLECTION & REHABILITATION

- 8 a.m. Cash for Compliance: The New Boom in Home Sewer Replacement
- 9:30 a.m. Trenchless Point Repairs, a Low Cost Permanent Solution
- 11 a.m. Penn State University Performs Manhole-to-Manhole Lining In-House

GAS, OIL & MINING

- 8 a.m. How to Decide What Dewatering Option is Best for You
- 9:30 a.m. Blower 101: The Basic Operation of the Positive Displacement Blower
- 11 a.m. Principles and Equipment of Hydro-Pneumatic Vacuum Excavation

GENERAL BUSINESS

- 8 a.m. Save Money — Move Your Business to the Cloud
- 9:30 a.m. Morally Bankrupt
- 11 a.m. Measuring Success Matters: Your Ads, Your Agents, Your Technicians

MUNICIPAL

- 8 a.m. Benefits of Digital Side Scanning Inspection Camera Systems
- 9:30 a.m. Application for Sewer and Storm Nozzles
- 11 a.m. Grinder Pumps & Application

PORTABLE LIQUID WASTE

- 8 a.m. A View from the Receiving End: Regulatory Challenges in FOG Programs
- 11 a.m. Now You Smell Me, Now You Don't: Deodorants

NEW TECHNOLOGY

- 8 a.m. Improving Safety and Technology with Wireless Technology
- 9:30 a.m. New Technology for Locating Sewer Line Leaks
- 11 a.m. Solve Decentralized System Malfunction Issues and Site Challenges

ADVANCED INSTALLER COURSE

- 8 a.m. - 5 p.m. Presenters: Jim Anderson and Dave Gustafson
Sponsored by Onsite Installer and COLE Publishing
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Country singer Craig Morgan will perform at the 2013 Pumper & Cleaner Environmental Expo during the ever-popular Industry Appreciation Party.



**“People ask me
how I stay grounded.
Man, I go home and
I still mow my own grass,
I clean my own pool.
I have kids that I play
with and love the same
as everybody else. I will
always be that same guy.”**

Craig Morgan

uty, and an assistant dairy manager at a Walmart store, in addition to his nearly two decades of military service, which include nine years in the Army Reserve.

He remains a big supporter of service members, travelling even to dangerous places to entertain. “I was one of the first artists to go into Afghanistan,” says Morgan, who received the 2006 USO Merit Award. “Right after the invasion, they were still sweeping up glass in Kandahar in the airport. I get to give those men and women a little piece of home. It really does make a difference.”

Hard at work

Success in the music business doesn't seem to have changed him. “After most gigs, he is right there with his band and road crew loading up the truck,” according to his Opry profile. Morgan adds, “Something in my genes and my blood requires that I work — right or wrong, it makes me feel like a man.”

His Opry appearances number more than 130, and he plays some 200 sold-out concerts per year. He has toured with the likes of Carrie Underwood, Keith Urban, LeAnn Rimes, Brad Paisley and Trace Adkins. He is also a competitive dirt bike racer in the Mid-South Hare Scramble Series.

In June 2010, he launched the “Craig Morgan: All Access Outdoors” TV program on the Outdoor Channel. It follows his lifestyle at home, touring and outdoors: hunting, aerial bow fishing, bungee jumping and skydiving. In its first season, it became the network's top-rated Saturday morning hunting show.

JUST AN ‘OLE BOY’

Craig Morgan brings his humble approach to chart-topping country music to the Expo's Industry Appreciation Party stage

By Ted J. Rulseh

Country star Craig Morgan rolls into Indianapolis and the Pumper & Cleaner Environmental Expo a year removed from his latest CD, “This Ole Boy,” which peaked at No. 5 on the *Billboard* Top Country Albums chart.

“When you go out and buy an album, and I've done it myself, you sometimes feel, ‘Well the songs on the radio were great but the rest was just OK,’ ” says Morgan, a member of the Grand Ole Opry since 2008. “When they play this record, I want them to say, ‘Man, I like the songs on the radio but I love this other song even better!’ That's what's rewarding about an album.”

Reviewers seem to think Morgan's latest meets that standard. A review on the Taste of Country website says, “‘This Ole Boy’ is an easy listen. Morgan includes 12 wholesome, folksy country songs, most sung with a crooked grin but no lack of sincerity. You find yourself

charmed by his good-natured, everyman character on songs like ‘More Trucks Than Cars,’ ‘Being Alive and Living’ and ‘Better Stories.’ ”

Great American Country says the album is “full of easygoing charm. Songs like the sexy ‘Love Loves A Long Night’ and ‘Fish Weren't Bitin’ fill out a solid collection that feels like a warm conversation. Craig's music and voice have always been engaging and accessible, and it's no different here.”

A successful decade

Expo attendees will sample tracks from that album when Morgan performs on Tuesday, Feb. 26, at the annual Industry Appreciation Party at the JW Marriott Hotel, connected to the Indiana Convention Center. They'll also hear some of his 14 Top Ten hits, which include “Redneck Yacht Club,” “Almost Home” (Music Row song of the year in 2003), and “That's What I Love About Sunday” (Bill-

board's most played country song of 2005 with five weeks in the No. 1 spot).

Morgan's songwriting and recording career goes back 13 years. He made his first appearance on the Grand Ole Opry stage on April 21, 2000, and was invited to become an Opry member during a special concert for troops at Fort Bragg in Fayetteville, N.C., on Sept. 18, 2008. The setting was fitting, since Morgan himself was stationed at Fort Bragg for two of his 10 years of active duty tenure in the U.S. Army's 82nd Airborne Division.

His Grand Ole Opry profile ascribes his appeal to honesty, work ethic and humility. “We grew up tough — dirt road, single-wide trailer,” he says. He never saw himself in a music career, even though his father was a bass player in Nashville. He spent time as an emergency medical technician, a contractor, a sheriff's dep-

FIVE QUESTIONS WITH CRAIG MORGAN

Q: How does your long experience in the military inform your approach to life? And does that inform your song-writing in any way?

Morgan: My time serving in the Army helped shape who I am today. It reinforced the values I learned at home — discipline, hard work, loyalty and sacrifice. I like to write from experience, and so I recently wrote a song called "What Matters Most," about our military men and women and the spouses and families they leave behind to serve our country. We recorded it and then donated it to Folds Of Honor to help raise money to support the families of fallen soldiers.

Q: What would you say is your signature song, and why?

Morgan: We've had a lot of hits, but to name one signature song is tough. I'd say, though, that everything we cut for my newest record, "This Ole Boy," is me to a T, especially "Being Alive And Living," and our newest single, "More Trucks Than Cars."

Q: Are there any lessons you feel small-business owners like Pumper & Cleaner Expo attendees could learn from your experiences working your way into the music business?

Morgan: There are two big things I've learned as an artist and entrepreneur in the music business and outdoor world. First, surround yourself with talented people. I like to joke and give everyone a hard time, but all my guys on the road with me and everyone back at home in Nashville keeping the machine running are top-notch. And second, never give up. You have to want it more than the next person and you have to be willing to work really hard to build your business, whether as an artist or in any career field.

Q: What is the single most important thing you would like the Pumper & Cleaner Expo audience to know about you before your performance?

Morgan: I'm a hardworking guy just like everyone out there. I like to dream big and live big, whether it's through my music, in the outdoors, or at home with my family.

Q: What should the Pumper & Cleaner Expo crowd expect from a Craig Morgan concert?

Morgan: Expect to be on your feet the whole time! I approach my shows like I approach my life — with a LOT of energy.

Staying grounded

Amid all the activity, family comes first with Morgan. "I love the music. I love singing and writing songs and producing records," he says. "But ultimately, I do what I have to do to take care of my family. People ask me how I stay grounded. Man, I go home and I still mow my own grass. I clean my own pool. I have kids that I play with and love the same as everybody else. I will always be that same guy."

"Whether I was working at Walmart or as a police officer, I enjoyed what I did. And I could

go right back to that today. I'm going to make whatever I do interesting and fun. I've always tried to look at this like, 'It's a job, and I'm blessed to have it.'"

Reflecting on his latest album, he observes, "No matter what level of an artist you are, you choose songs based on who you are at that time and how you feel. I'm at a point in my life where I'm extremely comfortable, extremely confident. I feel good about my family, my children, my friends, my career. I think the songs that I picked, looking back now, kind of reflect that." ♦



An ideal team - RiFlexio S with pushcable reel

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Turn off able – from ID 3.2" up to ID 8"

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AT YOUR FINGERTIPS

Spartan Tool's new sewer camera system combines a high-quality push camera, digital recording, and a monitor with touch-screen controls

By Erik Gunn

Sewer cameras are continually updated with new features and capabilities. Among the newer product lines now on the market is the PROvision Touch Camera System from Spartan Tool, LLC.

The PROvision Touch is a push camera equipped with powerful LED lighting and various sizes of hard plastic centering rings to accommodate various sizes of small pipe, including 2-, 3- and 6-inch options. But the more intriguing element of the system is its small footprint and the use of its video screen as a touch-screen-based control system.



A series of hard plastic centering guides allows the camera to be used in various sizes of pipe, up to 6 inches. Here, a 3-inch guide is attached to the camera.

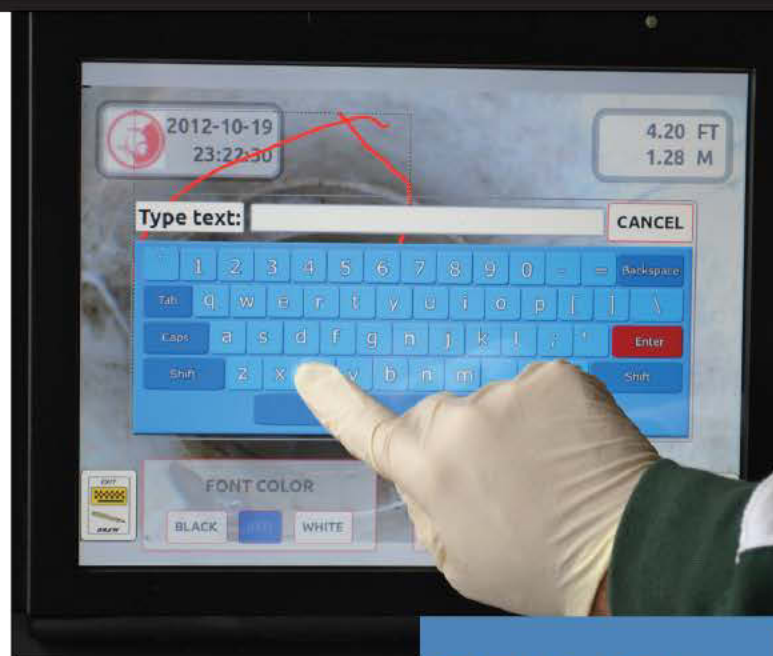
Brian Willis, territory sales manager for Spartan Tool, conducted a demonstration of the PROvision Touch system on Friday, Oct. 19, 2012, at the vehicle garage of Mark's Reddi Rooter service in Madison, Wis.

Walk-around

The PROvision Touch system utilizes a cable-mounted push camera 1.375 inches in diameter. The stainless steel, self-leveling, color camera has a scratch-resistant sapphire glass lens surrounded by a ring of LED lights for illumination. The camera is attached to a 100-foot line; a 200-foot second-



The coil-spring-covered flex link, just behind the camera head, is slightly larger than standard to better protect the cable from kinks or damage when negotiating sharp bends in the pipe.



The touch-screen keyboard on the PROvision Touch Camera System allows Brian Willis to label the marked defect in the pipe. (Photography by Erik Gunn)

ary line is also available. Immediately behind the camera, the cable is shielded with a coil-spring-like flex link, which Willis said is somewhat bigger than what is typically used and provides better protection for the cable when navigating tight turns.

The camera system's primary cable reel is mounted inside a 21-inch by 21-inch by 11-inch molded case that also contains the system controls, viewing screen and recording technology. When packed, the case and its contents weigh 54 pounds.

The 15-inch LCD viewing monitor is bright enough to be easily visible in daylight as it displays images from the camera. The screen is hinged to allow the user to set an optimum viewing angle for a particular location and position.

The monitor also functions as the system control panel, using touch-screen technology and on-screen control button icons.

In normal usage, the bottom of the screen displays five touch-screen icons for controlling the camera, recording video, playing video, taking a still "snapshot" during an inspection, and open-

TECHNOLOGY TEST DRIVE

EQUIPMENT:

PROvision Touch Camera and Control System

MANUFACTURER:

Spartan Tool, LLC
800/435-3866
www.spartantool.com

LOCATION OF DEMO:

Madison, Wis.

DEMONSTRATED BY:

Brian Willis, Spartan Tool, LLC

LIST PRICE AS DEMONSTRATED:

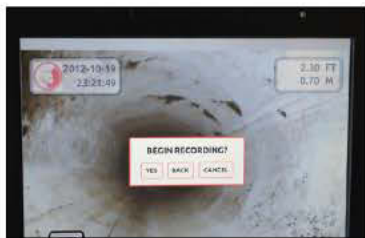
\$7,495

ing other control menus.

Other specific function button icons are displayed depending on the exact process under way. For example, if the system is making a recording, a button becomes available to stop the recording.

The system's distance counter display, which can be reset by touching the counter display, is positioned at the top right of the screen. A date-and-time display is at the top left.

The touch-screen system controls the camera and the recording, and is also used to access the files made during the inspection along with electronic files containing the system's user manual.



The touch-screen controls are used to control all aspects of the system. Here, the controls are used to start recording the inspection.

"You can scroll through the pages of the manual," Willis said.

Other controls allow the user to set the playback volume and other specifications, and an on-screen icon that resets the system to factory defaults is also provided.

An on-screen virtual QWERTY keyboard allows the operator to record information during an inspection. The touch screen also provides the ability to mark areas along a pipe while conducting inspections, simply by outlining the image with a finger on the screen.

The screen controls can also be hidden with the touch of a finger to allow for full-screen viewing, then can be restored as needed to control the system simply by touching the area of the screen where the control icons are normally located.

Data is recorded directly to a flash drive that can be easily removed for transfer to a PC or

"If we want to do a copy of the video, all we have to do is put another flash drive in, hit copy, and it will copy to the flash drive. Then we can give the flash drive right to the customer."

Brian Willis

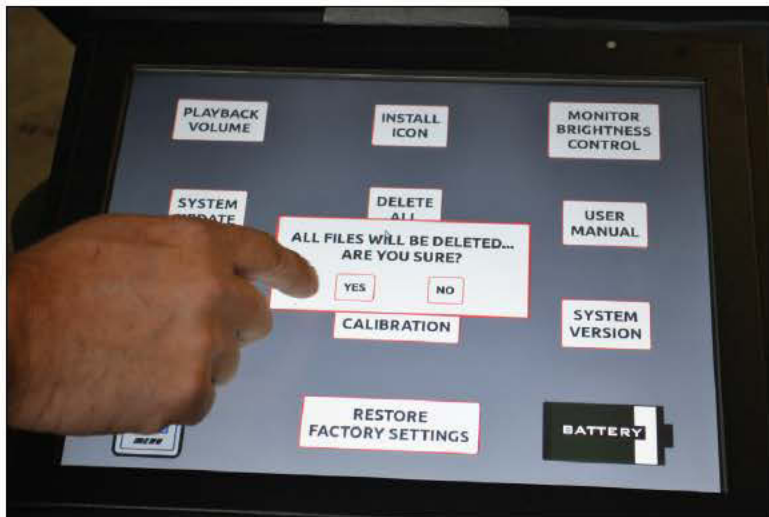
computer network for analysis and archiving.

"If we ever have an issue where we have to do an update for the system software, all we have to do is put in a thumb drive ... with the update," Willis said.

The system runs off either 110-volt conventional AC current or a 12-volt, lithium polymer rechargeable battery pack.

When the system's secondary 200-foot cable is employed, it is plugged into a dedicated port on the system case unit. When that happens, the system automatically switches transmission to that port, just as an audio device will automatically turn off its speakers when a user plugs in a headphone set.

Spartan's smaller, black-and-white Trap Eze camera, used for much smaller drains such as sinks or toilets, can also be used with the PROvision Touch control system.



Brian Willis demonstrates how the touch-screen menu is used to delete inspection files that were temporarily stored in the system.



Willis stands with the complete PROvision Touch unit, which includes a hard plastic case that contains the monitor screen and electronics for the system, as well as the 100-foot standard cable. RIGHT: The PROvision Touch base unit, with the screen operating to show the inspection as it takes place.



Operation

Willis began by fastening the 2-inch centering collar in place on the outside of the camera, then lowering it into the 2-inch drain line selected for the inspection. The line led to a catch basin, then to a pipe that connected with the sanitary sewer system.

Touching the upper right distance counter display opened a small menu that allowed him to reset the counter to zero. After zeroing the line counter, he touched the red-dot "record movie" icon at the

lower left of the screen, which began recording the inspection. A red dot in the corner of the screen indicated that recording was under way.

The drain had recently been cleaned, so as Willis pushed the camera in, the images it returned to the screen showed little in the way of obstruction or defects. The



The touch-screen keyboard allows Willis to label the defect.

images on the screen were bright, sharp and well lit. The screen was clear and easily viewed.

Willis continued pushing the camera into the line. As he did so, he pointed out that because of the camera's self-leveling capability, the picture was always oriented



The system stores data collected during inspections on a thumb drive (flash drive). The system's software also can be updated via thumb drive.

properly so that up was up on the screen and down was down.

Several feet in, Willis observed on the screen a vent in the line leading off to the upper left. With his finger, he drew a circle around the vent on the screen. The action left a visible, black electronic circle on the image — reminiscent of

the lines that football sportscasters make on the television screen to diagram plays for viewers. Willis touched the screen icon that controlled the keyboard and drawing functions, and brought up a menu to change the color of the hand-drawn circle from black to red to enhance its visibility.

Willis used the same touch-screen icon to call up the touch-screen keyboard, then labeled the site "vent."

At 7.2 feet, Willis encountered an elbow in the sewer line. He touched the snapshot icon to get a still picture, and used the touch-screen keyboard to label it "elbow." Taking the snapshot did not interrupt the video recording, Willis noted.

Willis continued to extend the camera into the line, reaching a distance of more than 40 feet. The images showed a clean line and then showed soap bubbles, believed to have been sent into the drain earlier when the crew from Mark's Reddi Rooter had washed some equipment.

Nearing the end of the line where it connected with the larger sanitary sewer line, Willis touched an on-screen button icon labeled "end movie" to stop the video recording. He then began draw-

ing back the camera, cleaning off the push rod before winding it back onto the reel.

After withdrawing the camera, Willis demonstrated the playback features. He used the touch screen to bring up a list of recorded files: an AVI file for the video and a PNG file for the still picture.

"If we want to do a copy of the video, all we have to do is put another flash drive in, hit copy, and it will copy to the flash drive. Then we can give the flash drive right to the customer," Willis said.

During playback, a series of touch-screen buttons for controlling the playback appeared, with options to play, stop, pause, fast forward, fast reverse, skip back and "slide" ahead in the video, using the operator's finger. Willis also was able to display the snapshot taken during the inspection.

Observer's suggestions

The images on the touch-screen monitor were sharp, very clear and very easy to see in a variety of light conditions.

At times, viewing the counter on the screen became confusing. Willis explained that the counter takes its information from the reel as it turns to feed out the push rod. Thus, if there's slack in the push rod and the reel doesn't actually turn for a time while the camera is pushed out, the moment-to-moment distance reading may not always correspond to the exact location of the camera.

Users will want to keep slack to a minimum while pushing the camera into the line being inspected.

Manufacturer's comments

Willis noted that users may wish to focus more on the images they receive when bringing the camera back from the far end of the line it is viewing. "When you're bringing the thing back you can get a better picture than when you're going forward because you don't have something obstructing the camera head," he explained.

A sonde-type beacon in the camera head that emits a 512 MHz

A secondary 200-foot line is available for use with the system. It can be plugged into a separate port on the PROvision Touch base unit.



signal makes it relatively easy to locate the underground camera by an operator working at street level with a locator set to the appropriate frequency, Willis said.

Willis noted that a business or other organization purchasing the unit can have its own logo incorporated into the opening splash screen visible on the unit.

The monitor uses a sapphire glass-covered screen, which Willis noted can be cleaned with conventional glass cleaners, such as Windex or similar products. "People do not have to worry about it if they've got dirty hands," he said.

The centering guides will fit in conventional PVC-based pipe. When using the camera in other pipe materials, such as cast iron, which may accumulate buildup, the user may wish to use a smaller centering guide than normal, Willis said. For instance, a 6-inch guide might be appropriate for an older, 8-inch cast iron pipe with significant buildup inside it. ♦

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IT'S ALL INSIDE

2013 Pumper & Cleaner Environmental Expo will feature the best tools and equipment to improve your utility

By Ed Wodalski

Ask any regular attendee of the Pumper & Cleaner Environmental Expo International what keeps bringing them back and they'll say it's seeing the latest products and services in one gigantic location.

With hundreds of vendors in Indianapolis this year, it'll be a challenge to see it all.

To make sure you don't miss out on any of the breakthrough industry offerings at the Indiana Convention Center, there's an interactive floor plan on the Exposition website (www.pumpershow.com) to help plan your visit. Whether you're a first-time visitor or longtime guest, we're certain the 33rd annual Expo will have all you need to build efficiency and profitability for your utility.

Here's a look at some of the products and services you won't want to miss.



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PIPE REPAIR

1 ACE DuraFlo Systems

ePIPE FRS high-performing epoxy resin lining from ACE DuraFlo Systems is designed for in-situ application in domestic hot and cold water piping systems down to 1/2-inch diameter. It can repair pinhole leaks, provide corrosion control and prevent lead leaching. 800/359-6369; www.epipeinfo.com; Booth 1460.

2 Avanti International

Sure Lift urethane foam from Avanti International is designed for lifting concrete slabs, under-sealing and stabilizing soils in highways, foundations and industrial floors. It is available in slow and fast versions for greater control of set times. The two-component, polyurethane foam is available in 5-gallon pails, 55-gallon drums and 270-gallon totes. 800/877-2570; www.avantigrout.com; Booth 5213.

3 Cretex Specialty Products

Easy Seal SG spray-applied sealant from Cretex Specialty Products is designed for the frame/chimney area of manholes. The cartridge system, loaded into a pneumatic gun with attached air hose, requires no preparation or messy cleanup. The sealant is a two-part, solvent-free polyurethane that is mixed in the disposable spray tips. 800/345-3764; www.cretexseals.com; Booth 1233.

4 Formadrain

DURAPOX epoxy resin from Formadrain has a 60-day shelf life, adding flexibility to trenchless repairs. The resin remains in a pre-cured state until steam is applied during the installation process. The resin can be used in the repair of both laterals and mains in pipe up to 48 inches in diameter. 888/337-6764; www.formadrain.com; Booth 1244.

5 Infratech Infrastructure Technologies

The Monoform ABS interior manhole forming system from Infratech Infrastructure Technologies is made for pouring new concrete walls and bases for complete rehabilitation of manholes. Designed to exceed H-20 traffic loading requirements, restoration is completed without traffic detours or disruption to adjacent utilities. Custom forms for lift station rehab or retrofit and installation are available. 763/428-6488; www.infratechonline.com; Booth 6322.

6 Madewell Products Corp.

The PortaMortar application machine from Madewell Products Corp. mixes, pumps and sprays high-build restoration mortar and 100 percent solids epoxy coatings in difficult-to-reach areas. 800/741-8199; www.madewell.net; Booth 1446.

7 Mainline Backflow Products

The Straight Through Extendible Backwater Valve from Mainline Backflow Products is available in 4- and 6-inch diameters. Made of PVC DWV, the valve body can be extended to any desired depth by gluing the riser pipe into the valve body and extending it to ground level. A test gate is available. 877/734-8691; www.backwatervalue.com; Booth 1333.

8 Nu Flow Technologies

Nu Pipe Light Duty blown-in epoxy coating system from Nu Flow Technologies completely coats the inside of a variety of pipe systems, including copper and galvanized. The system is designed for use in 1/2- to 2-inch-diameter pipes in residential buildings with up to 40 connections. The potable epoxies are UL certified for drinking water. 800/834-9597; www.nuflowtech.com; Booth 4109.



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9 Parson Environmental Products

The Pro50 Starter Manhole Rehabilitation Equipment system portable pump and mixer from Parson Environmental Products are separate units powered by a 110-volt circuit. An onboard computer balances the spray rate with the pumping volume to prevent clogging. The accessory diaphragm compressor delivers high-volume output with low pressure to ensure complete and even application. 800/356-9023; www.parsonenvironmental.com; Booths 4320, 4321.

10 Rausch Electronics USA

The Joint Pressure Testing system from Rausch Electronics USA is mounted to the Rausch L135 tractor and pushed through pipelines 8 to 24 inches in diameter where joints can be isolated and tested for leaks. The KS135 camera is mounted inside the JPT for positioning over the joint. 877/728-7241; www.rauschtev-usa.com; Booth 6137.

11 Reed Manufacturing

DM2100 drilling machines from Reed Manufacturing can cut or drill through cast iron, ductile iron, C900 PVC and PE water mains while under pressure. The machines use Reed D series drill bits or hole cutters. A variety of kits are available for drilling 3/4- to 2-inch pipe. 800/666-3691; www.reedmfgco.com; Booth 1083.

12 Sauereisen

SewerGard No. 210X standalone, high-strength, 100-percent solids epoxy polymer lining from Sauereisen exceeds 15,000 psi and 12.9 percent elongation. Designed to protect concrete, masonry, brick and steel substrates, the coating resists hydrogen sulfide and sulfuric acid. It contains no VOCs. One gallon covers 20 square feet at 80 mils. 412/963-0303; www.sauereisen.com; Booth 6140.

13 Safety Sewer Drain

The Safety Sewer Drain eliminates the mess and threat of contamination when removing the cleanout on a plugged drain. Made of clear polypropylene, the device fits over a 4-inch cleanout. Sewage drains through a valve-controlled hose into a bucket for disposal. The drain can be adapted to work on a 3-inch cleanout. 906/753-4002; www.safetysewerdrain.com; Booth 6064.

14 Savatech Corp.

Large, multi-size, pillow-shaped pneumatic blocking and bypass plugs for 24- to 120-inch diameter pipes from Savatech Corp. are made from Kevlar-reinforced rubber to resist wear and age while providing extra strength. Plugs can be used in large round, oval or elliptical pipelines, (concrete, plastic and iron) and folded lengthwise and inserted through tight access points. 888/436-9778; www.savatech.com; Booth 5453.

15 Sewer Seal Technologies

CureLight UV-curable resin from Sewer Seal Technologies is designed for use in underground structures, water and wastewater treatment plants. It also is available as a fiberglass and UV-curable resin composite patch that bonds to concrete, block and brick. It is hand-applied in the field and cures in seconds with a hand-held UV light. 513/253-8461, Booth 4348.

16 Superior Signal Company

The Model 25 High Output smoke blower from Superior Signal Company can be configured with smoke candles and/or smoke fluid to detect sources of inflow and other faults in sewer lines. The blower blasts 4,000 cfm of smoke at 4.0 static pressure, fits standard manholes and has a second outlet to blow into pipes and other openings. 800/945-8378; www.superiorsignal.com; Booth 2323.

17 Turbo Fog

The MH-75 manhole smoke blower from Turbo Fog is a self-contained smoke tester for identifying leaks in municipal collection lines. The tester uses aerosol smoke cartridges. No additional smoke bombs or garden sprayers are required. Made of 11-gauge, powder coated steel, the blower generates 7,500 cfm and is available with Briggs & Stratton or Honda engines. 800/394-0678; www.turbo-fog.com; Booth 6116.

PIPE BURSTING

18 RODDIE

The low-pressure lateral pipe bursting machine from Roddie slides apart into two pieces, weighing 65 pounds each, and can be re-assembled by hand in the excavation pit. The system can be powered and controlled by an on-site tractor and will pull 30 tons at 2,800 psi and 50 tons at 4,700 psi. A portable hydraulic power pack is available. 408/224-7777; www.roddieunderground.com; Booth 4237.

19 TRIC Tools

The X20 lateral bursting system from TRIC Tools features a monolithic, gun-drilled hard aluminum cylinder body and steel pulling bridge. The 60-pound puller is designed for 4-inch residential sewer bursting. The assembly includes puller (8 inches by 27 by 5.25 retracted), pulley base (12 inches by 13 by 14) and resistance plate (24 inches by 24 by 1). 888/883-8742; www.trictools.com; Booth 5354.



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LINING SYSTEMS

20 Amerik Engineering

The 7-minute Top Seal lateral sealing system from Amerik Engineering features a resin-impregnated fiberglass laminate cured with ultraviolet light, a cutter to reopen laterals in relined pipes from 6 to 22 inches, Fiber Spot Repair sectional steam-cured liner (45 minutes curing time) and Pipe Ferret self-propelled cutter with camera for 4- and 6-inch pipes. 770/924-2899; www.amerikengineering.com; Booth 6148.

21 AP/M Permaform

The CentriPipe centrifugally cast concrete pipe system from AP/M Permaform is designed for the structural lining of culverts. Using a spin caster and PL-8000 mortar, the process provides waterproofing, sealing, structural reinforcement and corrosion protection. It contains a rust inhibitor and is abrasion resistant. 800/662-6465; www.permaform.net; Booth 2113.

22 CIPP Services

Turn-key, custom-built lining equipment from CIPP Services includes wet-out conveyors, static resin mixers, air inverters and shooters, water inversion equipment, refrigerated transport trailers with hydraulic liner loading/unloading systems, hot water boiler trucks (up to 16 million Btus) and steam trucks (up to 150 hp). Equipment is available with on-site training. 815/712-8708; www.cipp-services.com; Booth 4347.

23 Flow-Liner Systems Ltd.

The Multi-System trailer from Flow-Liner Systems Ltd. enables contractors to line 1/2- through 2-inch I.D. potable water services as well as 2- through 6-inch I.D. drains. The trailer also has a robotic cutting system for a finished installation. 800/348-0020; www.flow-liner.com; Booth 4234.

24 Infrastructure Repair Systems

Mainline and lateral trenchless point repair from Infrastructure Repair Systems is designed for pipe from 3-to-36 inches in diameter and up to 15 feet long. The system includes no-shrink epoxy resin, custom-sewn felt or fiberglass, four liner weight options, no Styrene or VOCs, flow-through mainline carrier and push or pull lateral carrier. 877/327-4216; www.irs.net; Booths 2469, 2470.

25 LMK Technologies

The portable Power Cure mini steam cure unit from LMK Technologies can be maneuvered into areas too small for boiler trucks and other large equipment. It can cure lateral and sectional liners in approximately 30 minutes. The unit is compatible with all types of CIPP linings and thermoset resins. 815/433-1275; www.lmktechnologies.com; Booth 1354.

26 MaxLiner USA

The cured-in-place pipe relining system from MaxLiner USA repairs laterals without digging up yards, sidewalks or damaging interior walls, as well as vertical drain pipes behind walls and beneath floors. 276/656-1225; www.maxlinerusa.com; Booth 1160.

27 Perma-Liner Industries

Perma-Main continuous lining F-10, F-18 and F-24 Top Guns from Perma-Liner Industries can invert 700 feet in one setup. The unit's design enables quick installs on 6- to 24-inch lines and rapid cure times using the portable Viper Steam Cure System. Turnkey trailers available. 866/336-2568; www.perma-liner.com; Booth 3223.

28 Pipe Lining Supply

Lateral lining felt from Pipe Lining Supply has a poly scrim built into the felt to minimize stretching, along with a polyurethane coating and stitched seam. The Quik-Pox epoxy resin is formulated with surfactants that make it easier to be absorbed into the felt liner and invert. A thickening agent eliminates resin migration. 714/630-6311; www.pipeliningupply.com; Booth 6302.

29 PrimeLine Products

Cured-in-place sectional lining equipment and materials from PrimeLine Products are offered ala carte and in bulk quantities. Products include plugs, manhole/wetwell rehabilitation, chemical grouting, resins, fiberglass cloth, smoke testing and cleaning nozzles. 877/409-7888; www.prime-line.net; Booth 5360.

30 Quadex

Interfit lateral connection rehabilitation technology from Quadex extends from the main 12 to 20 inches into the lateral, sealing the annular space between a main liner and host pipe, lateral connection and first joint. The system includes a 360-degree CIP fiberglass sock in the main that helps anchor the lateral portion of the sock. 870/758-8628; www.quadexonline.com; Booth 1071.

31 Quik Lining Systems

CIPP sewer lateral lining from Quik Lining Systems can be installed from the wet-out stage without transporting, storing or loading it into a launching device. Unlimited lengths of 3- through 8-inch-diameter resin-impregnated liner can be installed. The pinch roller enables precise calibration up to 10 inches in diameter and thicknesses from 2 mm to 100 mm. 714/296-5262; www.quiklining.com; Booth 6300.



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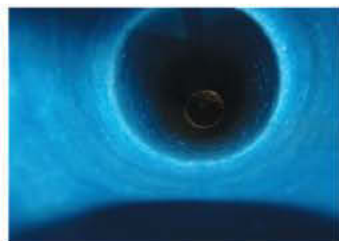
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32 Saertex multiCom

The UV-cure Saertex-Liner from Saertex multiCom is designed for the rehabilitation of sanitary sewers and storm pipes. Features include a high flexural modulus and flexural strength for a tight fit and high strength. The liner is available in 6- through 52-inch diameters, as well as irregular shapes and transitions.

866/921-5186; www.saertex-multicom.com; Booth 2262.

33 Trelleborg Pipe Seals Millford

Designed for lateral pipe rehabilitation with bends and diameter transitions. The polyester needle fleece liner with TPU coating is able to negotiate multiple 90-degree bends with minimal wrinkles and can bridge pipe diameters up to two dimensions (4 to 6 inches, 8 to 10 inches) while retaining minimum wall thickness.

800/626-2180; www.trelleborg.com/npc; Booth 1211.

INSPECTION SYSTEMS

34 Allan J. Coleman Co.

The Gvision S/3000 monitor from EPL Solutions, distributed by Allan J. Coleman Co., records video directly onto the photo app of an iPhone, iPad or iPod. Weighing 8.5 pounds, it also records onto a USB thumb drive or hard drive. The monitor pivots on its cover/stand and can be mounted on camera reels for eye-level viewing.

773/728-2400; www.allancoleman.com; Booth 3136.

35 Aries Industries

The LETS (lateral evaluation television system) wheeled tractor from Aries Industries can inspect mainline sewers 36 inches in diameter and launch into and televise laterals 3 inches in diameter. Mainline video is viewed through a fixed-mounted camera on the crawler. Lateral video is produced by a pan-and-tilt push camera with self-cleaning wiper. 800/234-7205; www.ariesindustries.com; Booth 5158.

36 Cobra Technologies

The Portable Inspection System from Cobra Technologies offers the functionality of a truck-mounted system in a go-anywhere package. Features include full Cobra data collection capabilities, including MPEG video that operates with any Cobra 6- and 8-inch crawler/camera. The system weighs 130 pounds and can be mounted to ATVs or trailers. 800/443-3761; www.cobratec.com; Booth 3212.

37 CUES

The semi-autonomous, high-resolution, digital universal camera (DUC) from CUES is designed for rapid and detailed condition assessment. The side-scanning camera, when used with CUES asset-based Granite XP decision support software, can inspect 5,000 feet of pipe per day. The system produces a continuous hemispherical scan in 6- to 60-inch pipe. 800/327-7791; www.cuesinc.com; Booth 5016.

38 Electric Eel

The eCAM Pro 2 pipeline inspection camera system from Electric Eel features a stainless steel-housed, 1.68-inch self-leveling camera with sapphire lens, 20-LED light ring and high-resolution CCD element. A flexible camera spring is designed to navigate 3-inch P-traps. The system includes 200 feet of 1/2-inch pushrod and 512 Hz sonde. 800/833-1212; www.electriceel.com; Booth 4156.

39 Envirosight

ROVVER Measurement Suite image-analysis software for the ROVVER X pipe inspection crawler from Envirosight enables the operator to measure a variety of pipe attributes from the system's touch-screen control pendant. Using adjustable overlays, the software calculates flow level; pipe diameter, bend and offset; branch angle; clock position; and diameter of service connections. 866/936-8476; www.envirosight.com; Booth 6018.

40 General Pipe Cleaners/General Wire Spring

The Gen-Eye Micro-Scope handheld inspection tool from General Pipe Cleaners/General Wire Spring is designed to inspect small drain lines, toilet traps and hard-to-reach places. The monitor connects to the reel with an adjustable mount. Features include 100 feet of micro pushrod, 39-inch probe rod, and three attachments to improve viewing angle or retrieve objects. 800/245-6200; www.drainbrain.com; Booth 6412.

41 MTech

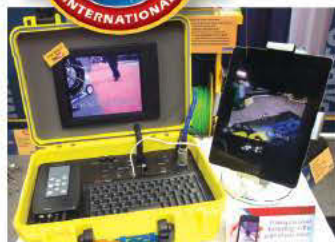
The combination CCTV/Electro Scan truck accessory from MTech automatically identifies and quantifies cracks, joints and service connection defects in sewer mains and laterals. Model ES-38 is designed for 3- to 8-inch diameter sewer laterals and Model ES-620 for 6- to 20-inch sewer mains. 800/362-0240; www.mtechcompany.com; Booth 2215.

42 Pipeline Analytics

WinCan ProTouch pipe inspection software from Pipeline Analytics is designed for touch-screen data entry on a tablet PC. Fully compatible with WinCan v8, the software generates basic manhole-to-manhole reports that include schematics and captured images. Captured data uploads to WinCan v8 for advanced reporting, filtering/querying and GIOS integration. The software works with common video inspection hardware. 877/626-8386; www.pipelineanalytics.com; Booth 6018.

43 RapidView IBAK North America

The Polaris camera system from RapidView IBAK North America is designed for inspecting smaller diameter pipelines. Features include a 3-axis range of movement that enables the unit to choose the direction of travel when encountering tees or wyes. Other features include upright picture control, pan, tilt and angle control, wide-angle view (120 degrees) and built-in laser measurement. 800/656-4225; www.rapidview.com; Booth 2207.



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44 Ratch Electronics Ltd.

The integrated cellphone interface from Ratch Electronics Ltd. records directly to an iPhone, iPad or iPod, enabling users to upload pipe inspection video from the jobsite to YouTube for customer viewing. The interface is adaptable to any Ratch system. Included is an on-screen display overlay, providing distance counter, time, date and eight pages of memory. 800/461-9200; www.ratch-electronics.com; Booth 5140.

45 RIDGID

The SeeSnake Max rM200 camera system from RIDGID is made for inspection lines up to 200 feet in length and 1.5 to 6 inches in diameter. Features include improved reel mechanics for easier passage through tight turns, compact camera and abrasion-resistant cable. The system is compatible with SeeSnake monitors, including CS10 and CS1000 digital recording machines. 800/769-7743; www.ridgid.com; Booth 1243.

46 Rothenberger USA

The Roscope 1000 video scope self-leveling color inspection camera from Rothenberger USA is designed for duct, drain and pipe inspection. The camera head keeps the picture upright and prevents loss of orientation. Features include zoom, scroll, picture and video recording, and ergonomic shape for single-hand operation. 800/545-7698; www.rothenberger-usa.com; Booth 1321.

47 RS Technical Services

The TranSTAR II tractor and TrakSTAR II camera combination for video pipeline inspection from RS Technical Services has a pan-tilt-zoom camera for sanitary or storm lines 6 inches in diameter and larger and up to 3,000 feet in length. The 14-inch-long tractor has dual 90-watt motors and can achieve speeds up to 70 feet per minute. 800/767-1974; www.rstechserv.com; Booth 2431.

48 RVI Pro

The mini 3 pipe inspection system from RVI Pro features a 13 mm by 6 mm camera head with 15 meters of push/pull cable (30 meter cable and sonde transmitter available), integrated 3.5-inch LCD monitor with image capture and video recording and AC/DC operation contained in a shatter-proof housing with reel. 219/395-1963; Booth 6247.

49 Spartan Tool

The iPad sewer lateral inspection camera from Spartan Tool uses an iPad as a viewing screen and processor. Self-contained and weighing 28 pounds, the system has 200 feet of pushrod, self-leveling camera head, 512 Hz beacon and full iPad touch-screen capabilities. Users can record or take snapshots at any time, edit video or photos, and record voice. 800/435-3866; www.spartantool.com; Booth 5024.

50 Vivax-Metrotech Corp.

The vCam-5 inspection system from Vivax-Metrotech Corp. features a lightweight, compact control module with 8-inch color LCD, dual frequency transmitting sonde and digital recording to the internal 300 GB hard drive, USB thumb drive or SD card. The system can inspect pipe 3 to 12 inches in diameter and distance from 100 to 400 feet. 800/446-3392; www.vxmt.com; Booth 4233.

51 Western Mule Cranes

The P-5A 1,000-pound capacity telescoping boom crane from Western Mule Cranes is designed for CCTV pipeline inspection applications. Operated with a 10-foot, handheld pendant control, the crane with boom folds and stores parallel to the mast, requiring 14 by 14 inches of floor space. A positive rotation-lock secures the boom at 12 fixed points of rotation. 800/288-6853; www.westernmule.com; Booths 4338, 4339.

52 Wohler USA

The relining adapter kit for efficient pipe repair from Wohler USA is available for VIS2xx and VIS3xx visual inspection camera systems. The kit comes with centering star to ensure the camera remains on the bottom of the lateral and three protection sleeves that prevent the camera cable from being cut by the saw during re-installment. 978/750-9876; www.wohlerusa.com; Booth 1456.

PIPE CLEANING

53 Bowman Tool Company & Systems

The Dominator 430 reinstatement cutter from Bowman Tool Company & Systems is designed to operate in 6- to 30-inch relined pipe. The 72-pound cutter is made from a solid billet of stainless steel and features a pinion-less, quick-change design with one adjustable gib. Electric motors are isolated in a watertight chamber. 714/432-1403; www.bowmantool.com; Booth 5251.

54 Cam Spray

The RCJ skid-mount jetter series from Cam Spray is available in flows and pressures of 12 gpm at 2,700 psi, 8 gpm at 3,500 psi and 7 gpm at 4,000 psi. Features include a three-plunger industrial pump powered by a 688cc Honda engine and 200 feet of jetter hose. 800/648-5011; www.camspray.com; Booth 2300.

55 Chempace Corp.

Sewer Foam from Chempace Corp. assists in removing solids buildup in sewer lines when added to jet truck water. The foaming action cleans while live bacteria left behind help prevent solids from reforming. 800/423-5350; www.chempace.com; Booth 1472.



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56 Chempure Products Corp.

Root Rat cutting nozzles from Chempure Products Corp., designed for use with jetters as small as 11 hp, are available in 3/8-, 1/2-, 3/4- and 1-inch sizes. Made of hardened stainless steel, the cutters come with toolbox and interchangeable rotors: one with cables and one with chains. The combination kit includes extra chain, cable and bearings. 800/288-7873; www.chempure.com; Booth 4004.

57 ENZ USA

Turbopuls rotating vibration nozzles from ENZ USA in 1/2- and 3/4-inch connection sizes are designed for use in recycling water. Maintenance-free ball bearings ensure optimal rotation. Vibration impulses from inside the nozzle are transferred to the working head to gently loosen hard deposits in HDPE plastic, steel and concrete pipe. 877/369-8721; www.enzusainc.com; Booths 1193, 1197.

58 GPM Pump and Truck Parts & Service

The Sewer Duck jetter from GPM Pump and Truck Parts & Service can be custom built to needed specifications. Options include Myers E80-25 and D65-20 pumps, choice of Cummins engines and cold weather systems. 630/543-7373; www.gmpumptruckparts.com; Booth 2100.

59 Hammelmann Corp.

The XXL automatic tank cleaning head from Hammelmann Corp. is designed to remove hard scale buildup from large tanks and pipes. Using high-pressure water, the nozzle arm rotates the cleaner around its vertical axis. The head can be operated with pressures up to 23,000 psi and flow rates of 150 gpm. 800/783-4935; www.hammelmann.com; Booth 3109.

60 Logiball

The Lateral Cleaning Launcher from Logiball guides 1/2- or 3/8-inch hose and nozzles into the lateral connection from the mainline sewer. Winched in tandem with a CCTV camera, the 0-9 VDC motor rotates the guiding arm and nozzle into the lateral. Back jets propel the hose up to 70 feet for cleaning and cutting roots. 800/246-5988; www.logiball.com; Booth 5227.

61 NozzTeq

The BL Swiper sewer nozzle from NozzTeq features stainless steel construction with green poly coating. Stainless steel tubes loop water along the air channels for increased air flow and jet stream, reducing pressure at the truck. It is designed for 12- to 30-inch lines and the small BL Swiper cleans 6- to 18-inch lines. Stainless/ceramic jets available. 866/620-5915; www.nozzteq.com; Booth 1250.

62 Shark Pressure Washers & Jetters

The SJPE-1500 portable jetter from Shark Pressure Washers & Jetters operates on 115-volt electricity and delivers 1.7 gpm at 1,500 psi. Features include 35-foot power cord, detachable hose reel and a slide-in handle to accommodate loading and unloading. Designed for 2- to 4-inch pipes, the jetter has a steel roll cage chassis, triplex pump and Baldor motor. 800/771-1881; www.sharkpw.com; Booth 6324.

63 StoneAge

The Manhole Cleaner pipe cleaning tool from StoneAge features jets directed at the manhole walls. Conversion requires exchanging the standard WG 040 head with the Manhole Cleaner head kits that include a head with 1/2-inch extension arms and nozzles. 866/795-1586; www.stoneagetools.com; Booth 5130.

64 USB - Sewer Equipment Corp.

The Turbo III flexible chain cutter from USB - Sewer Equipment Corp. features a teardrop-shaped skid made of temperate stainless steel. The chain retainer, driven by a high-performance turbine, removes roots, grease and mineral deposits from 10- to 20-inch sewer lines (up to 30 inches with extension kit). The guide skid can be adjusted in 1/16-inch increments. 866/408-2814; www.usbsec.com; Booth 5043.

EXCAVATION, WASTE HANDLING

65 Ditch Witch

The FX50 vacuum excavation system from Ditch Witch delivers 49 hp and is available with a variety of tank sizes, trailer configurations, hydraulic booms, water heaters and hydraulic valve exercisers. The system comes with a choice of four spoils tanks (300 to 1,200 gallons) and four water tanks (80 to 500 gallons). 800/654-6481; www.ditchwitch.com; Booth 5216.

66 Supervac 2000

The 6400 hydroexcavator from Supervac 2000 has a 4,200-gallon debris tank and 6,400 cfm vacuum pump with 72 inches Hg. The unit features a 1,250-gallon water tank, two cyclones and cartridge filter, 6,000 psi water pump and 26-foot-radius hydraulic boom. Other features include hydraulic door locks, insulated enclosure (less than 85 dBA) and 100-foot hose reel capacity. 866/839-5702; www.supervac2000.com; Booth 6036.

67 Westmoor Ltd.

The Conde ProVac industrial liquid waste pumping system from Westmoor Ltd. is designed for grease trap and other industrial pumping. Pumping 120 gpm, a flip of the switch starts the vacuum mode. A built-in exhaust deodorizer keeps odor at a minimum. A flip of the switch turns on the pressure mode for offloading. 800/367-0972; www.westmoorltd.com; Booth 5124.



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PUMPS

68 Gorman-Rupp Co.

The Prime Aire Plus line of pumps from Gorman-Rupp Co. features up to 8-inch flanged discharge sizes, flows up to 4,950 gpm and heads to 475 feet. Designed for clear liquids and large solids, pumps are coupled to the latest EPA Tier-compliant engines or energy-efficient electric motors. 419/755-1251; www.grpumps.com; Booth 1239.

69 Rain for Rent

The Total Dynamic Head Calculator app for iOS devices from Rain for Rent is based on Hazen-Williams equations. Users enter the hydraulic parameters of their pumping system and the app returns TDH. It estimates both suction-side and discharge-side hydraulic losses, features NPSH estimation, and suggests combinations of standard pipe materials and pipe sizes. 800/742-7246; www.rainforrent.com; Booth 1227.

70 Thompson Pump & Manufacturing Company

The HT trash pump from Thompson Pump & Manufacturing Company is designed to handle large solids and abrasive materials. Pumps can handle up to 3-inch solids and are available in 4-, 6- and 8-inch sizes with performance up to 2,600 gpm and 168 feet of head. 800/767-7310; www.thompsonpump.com; Booth 4014.

TRUCK ACCESSORIES

71 Air-Weigh Scales

The LoadMaxx on-board scale from Air-Weigh Scales provides weight information for drive suspension, steer suspension, lift axle, GVW and net payload. The on-screen menu enables setup and calibration. Weights are displayed on an in-cab display. An alarm warns drivers when they are reaching maximum legal weight. 888/459-3444; www.air-weigh.com; Booth 2278.

72 Pelican Worldwide

The solid brass lever valve for vacuum trucks from Pelican Worldwide is available in 2-, 3-, 4- and 6-inch sizes. The easy-opening, lever-action slider valve is made of brass with threaded connections. 713/862-5557; www.pelicanww.com; Booth 1112.

REELS, HOSES

73 Hannay Reels

The HDD6200 series jetting hose reel from Hannay Reels has a heavy-duty swivel base, guide arm and operator handle for precise payout. Rotating ball bearings enable the swivel base to move freely in any mounting position. The reel handles high-pressure liquids through a single 3/4-inch to 1-inch I.D. hose. 877/467-3357; www.hannay.com; Booth 5027.

74 Kuriyama of America

Tigerflex Amphibian abrasion-resistant, polyurethane-lined suction hose from Kuriyama of America is designed for wet and dry applications. The static dissipative cover helps prevent the buildup of static electricity. Cold-Flex materials enable the hose to remain flexible in subzero temperatures. The oil-resistant liner resists most animal and petroleum-based oils. 847/755-0360; www.kuriyama.com; Booth 3021.

75 Piranha Hose Products

The 1 1/2-inch, 2,500 psi sewer cleaning hose from Piranha Hose Products features a yellow, polyolefin tube, double layer of high-tensile synthetic braid reinforcement and abrasion-resistant orange cover. Temperature range is -40 to 150 degrees F. The Slither cover is available for tough sewer bends. 800/250-5132; www.piranhahose.com; Booth 3017.

76 Reelcraft Industries

Series SD10000 low-profile, spring retractable hose reels from Reelcraft Industries are designed to hold up to 50 feet of 3/4- and 1-inch hose for air, water, oil, fuel and vacuum recovery. Features include external drive spring and all-bolted frame. The low profile is suited for mounting in truck cabinets and limited-space areas. 800/444-3134; www.reelcraft.com; Booth 1373.

77 Southland Tool Mfg.

The Jersey Roller sewer hose protector from Southland Tool Mfg. fits over the top of concrete highway barriers and locks into place with two 3/4-inch bolts. 714/632-8198; www.southlandtool.com; Booth 3001.

78 SPIR STAR

The 3/6 Blast-Pro flex lance from SPIR STAR has a 1/2 inch end fitting O.D. and 40,000 psi working pressure. It is available with 1/4-inch 28 and 3/8-inch 24 male nipple ends and can be used in 40,000 tube cleaning with the StoneAge Banshee BN13 nozzle. 800/890-7827; www.spistar.com; Booth 2002.

79 UEMSI

RAM hose reel swivels from UEMSI are available in straight and 90-degree configurations in 3/4-, 1- and 1 1/4-inch sizes. The steel-cast swivels feature heat-treated rotary sleeves and gland nuts, nickel-plated backup ring and zerk fitting. 800/666-0766; www.uemsi.com; Booth 1264.



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DEWATERING

80 Aqua-Zyme Disposal Systems

The ADS 30-yard (15-yard available), open-top, roll-off dewatering unit from Aqua-Zyme Disposal Systems can be filled with 22,000 to 25,000 gallons of wastewater treatment sludge, septic and/or grease trap waste at 1 to 2 percent solids in approximately two hours. Sludge volume is reduced up to 80 percent with 98-percent reduction in BOD, COD, FOG and TSS. 979/245-5656; www.aqua-zyme.com; Booth 2091.

81 Bright Technologies

The 1.7-meter, trailer-mounted rental system belt press from Bright Technologies has a non-potable water belt wash booster pump, folding discharge conveyor with belt tracking, VFD controlled rotary lobe sludge pump and liquid polymer activation system. Rental units are made for rapid setup, with folding conveyor and operator walkways. No special lifting equipment required. 800/253-0532; www.brightbeltpress.com; Booths 4223, 4224.

SAFETY

82 BW Technologies by Honeywell

GasAlertMax XT II monitors from BW Technologies by Honeywell detect H₂S, CO, O₂ and combustibles. Fully compatible with the MicroDock II automated test and calibration system, the unit features one-button operation and motorized pump for intelligent, remote sampling and multi-sensory alarms, including visual, audible and vibrating. The pump inlet has a quick-connect for accessories. 888/749-8878; www.gasmonitors.com; Booth 4138.

83 Milwaukee Rubber Products

The GasAlertQuattro gas detector from Milwaukee Rubber Products features one-button operation. The graphic LCD displays information icons, including bump test and calibration status for on-site auditing. IntelliFlash provides continuous visual confirmation of detector operation and compliance. The unit is fully compatible with BW Technologies by Honeywell's MicroDock II automatic test and calibration system. 800/325-3730; www.milwaukeeerubber.com; Booth 3032.

84 US Jetting

Safety clothing and gloves from US Jetting offer protection up to 7,250 psi, including hose bursts and nozzles coming out of pipes. The waterproof gloves with Dyneema fiber have a rough, sand-patterned surface for a solid grip and inner glove for comfort. 800/538-8464; www.usjetting.com; Booths 5333, 5334.

MANAGEMENT SOFTWARE

85 C-Tec

AADIOS asset manager software from C-Tec enables users to process laser profiling data on the job site, read the matrix code from the CoolVision laser profiler and TV-Laser Mandrel inspection tools, manage field conditions and verify work in a step-by-step procedure before generating reports that meet DOT and municipal specifications. 866/993-0366; www.ctecworld.com; Booth 3033.

86 StreetEagle GPS Tracking

The Motorola wireless barcode scanner from StreetEagle GPS Tracking transmits scanned information in real time. Users scan the barcode on each asset when servicing, delivering or picking up, enabling managers to track assets (location, date/time and service verification) in the field. Automated and printable reports ensure proof of service and prevent loss. 301/866-1990; www.streeteaglegps.com; Expo both 2341.

LOCATING SYSTEMS

87 MyTana Mfg. Company

The MS2011 AccuCane 512 Hz analog locator from MyTana Mfg. Company is designed for simple operation. It locates in PEAK mode only. Depth is determined by signal strength. Vibrations signal the operator to turn down the gain while honing in on the transmitter. 800/328-8170; www.mytana.com; Booth 2200.

88 Prototek Corp.

The LineFinder LF2200 from Prototek Corp. locates any frequency sonde or transmitter box between 16 Hz and 100 Hz. Features include pre-set support of 16 Hz (steel or ductile iron, cast iron and nonmetallic), 512 Hz (cast iron, nonmetallic) and 8 Hz (nonmetallic) sondes. The locator traces underground metallic lines at four built-in industrial standard frequencies. 800/541-9123; www.prototek.net; Booth 4162.

EXCAVATION

89 GapVax

The HV Series of wet/dry hydroexcavators from GapVax feature various lift axle combinations, tri-drive and twin-steer chassis, debris bodies from 8 to 15 cubic yards, water tanks from 400 to 1,400 gallons, vacuum pumps from 3,500 to 6,600 cfm, water pumps from 2,000 to 5,800 psi, water heaters from 400,000 to 880,000 Btus and body pressurization off-load. 888/442-7829; www.gapvax.com; Booth 6004.



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90 Innovative Hydrovac Trucks

The IHT2512 Smart Truck hydrovac from Innovative Hydrovac Trucks features built-in interlocks with PLC and software to eliminate most operator-caused truck breakage. The truck has a 50-degree slope debris floor, full-width rear door and high-pressure wash system for offloading and cleaning. It can carry 2,500 gallons of freshwater and 12.5 yards of debris. 970/441-0148; www.hydrovactrucks.us; Booths 1320, 1324, 1422.

91 Ring-O-Matic

The 550 Hi cfm vacuum excavator from Ring-O-Matic has a 550-gallon spoils tank, 1,000-cfm displacement Gardner Denver blower, 6 gpm at 4,000 psi water pump, full-tilting tank, full-opening rear door and Cyclo-Jet pothole excavator gun. 800/544-2518; www.ring-o-matic.com; Booths 5308, 5309.

92 Super Products

The Mud Dog 1200 hydroexcavator from Super Products has 12-cubic-yard debris capacity, 1,000-gallon water tank with pump rated at 14 gpm at 3,000 psi. Features include onboard boiler for breaking up frozen ground and positive displacement vacuum pump with airflow rated at 5,800 cfm at 28 inches Hg. The rear-mounted telescoping boom can reach 19 to 27 feet. 800/837-9711; www.superproductsllc.com; Booth 6238.

93 Vacall Industries

The AllExcavate hydroexcavator from Vacall Industries delivers waterjetting pressure and vacuum forces for cleaning underground utility lines and dirt from trucks. The 8-foot, 6-inch telescoping boom has a 180-degree radius, enabling the unit to perform multiple jobs without repositioning. Features include single-engine operation, aluminum water tanks and AllSmart Flow control system (wired or wireless). 800/382-8302; www.vacallindustries.com; Booth 5230.

94 Vac-Con

The Power Flex telescoping boom from Vac-Con rotates up to 315 degrees, articulates up to 110 degrees and lifts up to 34 feet. The boom is top-mounted on the debris tank and telescopes out 8 feet for a reach of 28.5 feet from the truck. The boom can be outfitted on combination sewer cleaners, industrial machines and the X-Cavator product line. 904/493-4969; www.vac-con.com; Booth 1190.

95 Vermeer

The AXIS laser guided boring system from Vermeer is a pit-launched tool designed to install 10- to 14-inch pipe. The system consists of four main components (power unit, rack, vacuum pump and vacuum tank), offers pinpoint, on-grade accuracy and has the ability to install up to 350 feet of steel, clay, HDPE or PVC pipe in one bore. 888/837-6337; www.vermeer.com; Booth 2417.

WASTE HANDLING

96 Guzzler Mfg.

The upgraded Classic industrial vacuum loader from Guzzler Mfg. features enhanced operator ergonomics and improved air routing, filtration and maintenance. A longer body provides improved material separation. Enlarged bag house and cyclone cleanout access doors provide easier access. Transition to the dump tubes has been widened for more effective dumping. 800/627-3171; www.guzzler.com; Booth 8076.

97 PipeHunter

The VacHunter sewer vacuum combination unit from PipeHunter features positive displacement blowers with up to 6-inch vacuum, debris tanks up to 1,250 gallons and water systems to 80 gpm. The unit has a hydraulic-powered boom that works in conjunction with the rear-mounted hose reel for maneuverability and safe working conditions. 800/373-1318; www.pipehunter.com; Booth 6052.

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CREATING AN INTERNATIONAL STANDARD

The Pipeline Assessment and Certification Program now serves several countries in multiple languages

By Ted DeBoda, P.E.

We all knew there was a great need for the standardization of pipeline inspection in our industry back in 2001. The only thing we needed was a champion and some guidance. Both came together that year when the Pipeline Assessment and Certification Committee was formed under the leadership of committee chair Rod Thornhill of White Rock Consultants, then-executive director of NASSCO Mike Burkhard, and the Water Research Centre (WRC) in Swindon, England.

We held our first class in January 2002 after many meetings of the minds and some old-fashioned elbow grease. Since that time, PACP has grown steadily, gaining momentum as word spread about the new standard being adopted across the country. PACP has become increas-

ingly more important from coast to coast and is now included in many specifications and EPA consent decrees. Hawaii has been using PACP for several years, and we are now providing training in Alaska.

As the PACP expanded, the Centre for the Expertise and Research on Infrastructure in Urban Areas (CERIU) in Montreal, Quebec, determined that it would greatly benefit their asset management programs and aid in the quality and accuracy of the data collected. They translated PACP into French and adopted it as their standard in 2008, followed soon thereafter by the Canadian Standards Association, which sets standards for the rest of Canada.

Once Canada adopted the PACP standard, we turned our sights to the south and created a Latin America Committee to aid in determining the feasibility of expanding PACP into that region. Colombia showed

the most interest, although we determined there was a definite need in other areas of the region as well.

In order to meet the demand for PACP in Spanish-speaking areas, the Latin America Committee, under the guidance of Diego Calderon, NASSCO staff engineer, began the process of translating the manual and all of the training materials needed to conduct a successful class in Spanish. After extensive peer review, the materials were ready for prime time.

The first two-day class was held at CDM-Smith's Bogotá office, and was delivered last October by Master PACP Trainer Luis R. León, P.E., BCEE, a project manager at CDM-Smith. An attendance of 12 to 14 students was projected, but 22 sewer professionals ultimately participated in the class, which led to a well-diversified learning experience. Participants included contractors, consulting firms, operators and

municipal engineers. In particular, there was a high percentage of attendance of engineers and operators from the three largest municipal sewer service providers in Colombia: Bogotá (EAAB); Medellín (EPM); and Cali (EMCALI). The training in Colombia sparked interest in other South American countries, as well as Puerto Rico.

Our mission at NASSCO continues to meet the current needs of the industry: To set industry standards for the assessment and rehabilitation of underground infrastructure, and to assure the continued acceptance and growth of trenchless technologies, now in multiple countries and in multiple languages. If there is a need for PACP in your area, please contact NASSCO. ♦

Ted DeBoda is executive director of NASSCO. He can be reached at director@nassco.org.

NASSCO (National Association of Sewer Service Companies) is located at 11521 Cronridge Drive, Suite J, Owings Mills, MD 21117; 410/486-3500; www.nassco.org

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February 13-14, 2013

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Includes Manholes and Laterals!

Trainer: Garret Harvey

For more information or to register contact Jasmine Harvey at 403-243-0276 or jasmine@thuro.ca

March 5-7, 2013

Waterbury, CT

Includes Manholes and Laterals!

For more information or to register contact Laurie Perkins at 603-570-7115 or laurie.perkins@wright-pierce.com

March 8-10, 2013

Twinsburg (Cleveland), OH

Includes Manholes and Laterals!

Trainer: Brandon Conley

For more information or to register contact Kay Doheny at 248-939-3220 or pacp@doheny-supplies.com

March 13-14, 2013

Kelowna, British Columbia, Canada

Includes Manholes and Laterals!

Trainer: Garret Harvey

For more information or to register contact Garret Harvey at 250-223-8664 or gevanharvey@gmail.com

March 18-20, 2013

Owings Mills, MD

Includes Manholes and Laterals!

For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

April 15-17, 2013

Owings Mills, MD

Includes Manholes and Laterals!

For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

May 6-8, 2013

Owings Mills, MD

Includes Manholes and Laterals!

For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

Northville, MI

Includes Manholes and Laterals!

Jack Doheny Companies Open House Equipment/ Training Show

(Thurs. May 9, 2013 - ALL INVITED)

Trainer: Brandon Conley

For more information or to register contact Kay Doheny at 248-939-3220 or pacp@doheny-supplies.com

May 14-16, 2013

Atlantic City, NJ

Includes Manholes and Laterals!

NJ WEA Annual Conference

Trainer: Brandon Conley

For more information or to register contact Kay Doheny at 248-939-3220 or pacp@doheny-supplies.com

PACP RECERTIFICATION

March 7, 2013

Sacramento, CA

PACP User Recertification

For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

April 9, 2013

Owings Mills, MD

PACP User Recertification

For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

NASSCO PRO TRAINING



ITCP TRAINING

If you are interested in having a class at your facility or in your area, contact Gerry Muenchmeyer at 252-626-9930 or gmuenchmeyer@suddenlink.net



There
simply is
NO Contest

LMK's T-Liner® is a one-piece homogenous main and lateral CIPP connection liner that exceeds the standard set by ASTM 2561-11. T-Liner® has a uniform wall thickness and incorporates compressible material at the upstream and downstream ends creating a smooth tapered transition to the host pipe. Both the mainline and lateral sections are formed as a structural cylinder that renews 18-inches and 360-degrees of the mainline and extends up the lateral pipe as one continuous lining. The T-Liner® incorporates gasket-sealing technology in the form of Insignia™ Hydrophilic Hat at the connection and O-rings that surround the main liner. These hydrophilic compression O-rings are embedded between the host pipe and the T-Liner® providing a verifiable non-leaking connection (VNLC) with all pipe types including polyethylene.



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TV/Video Inspection & Location

		Dealer/Distributor	Pipe Diameter	Reel Sizes	Recording Methods	Software Available	Repair Facility	Repair Parts	Accessories	Inspection Vehicles	Location Equipment
ARIES INDUSTRIES, INC. See ad page 35	Aries Industries, Inc. 550 Elizabeth St., Waukesha, WI 53186 800-234-7205 262-896-7205 Fax: 262-896-7099 www.ariesindustries.com sales@ariesindustries.com	Aries	2" to 120"	100' to 5000'	SD Card DVD	YES	YES	YES	YES	YES	YES
See ad page 67	Central Oklahoma Winnelson 5037 NW 10th St., Oklahoma City, OK 73127 888-947-8761 405-947-8761 Fax: 405-947-1934 www.centralwinnelson.com krjones@winnelson.com	RIDGID, General Wire	3/4" to 12"	30' to 325'	Flash Drive/ USB Thumb Drive, DVD		YES	YES	YES		YES
 See ad page 17	Cobra Technologies 4806 Wright Dr., Bldg. C, Smyrna, GA 30082 800-443-3761 770-435-8991 Fax: 770-435-0402 www.cobratec.com sales@cobratec.com	Cobra	6" to 200"	350' to 4500'	DVR, CD, DVD	YES	YES			YES	YES
 See ad page 25	CUES 3600 Rio Vista Ave., Orlando, FL 32805 800-327-7791 407-849-0190 Fax: 407-425-1569 www.cuesinc.com salesinfo@cuesinc.com	CUES	2" to 200"	100' to 4000'	HDD, Flash Drive/USB Thumb Drive, SD Card, Compact Flash, DVR, CD, DVD, VHS	YES	YES	YES	YES	YES	YES
 See ad page 27	Electro Scan Inc. 1745 Markston Rd., Sacramento, CA 95825-4026 800-975-6149 916-779-0660 Fax: 916-779-0661 www.electroscan.com chuck@electroscan.com	Electro Scan	6" to 60"	100' to 2500'	HDD, Flash Drive/USB Thumb Drive, SD Card, Compact Flash, Wireless Upload to Cloud	YES	YES	YES	YES		YES
 See ad page 2	Envirosight 111 Canfield Ave., Unit B3, Randolph, NJ 07869 866-936-8476 973-252-6700 Fax: 973-252-1176 www.envirosight.com office@envirosight.com	ROVVER, ROVVERX, QuickView, SuperVision, DigiSewer, VeriSight Pro, WinCan, DiaMetrik, OutPost, Agilios	2" to 96"	100' to 1650'	HDD, Flash Drive/USB Thumb Drive, SD Card, Compact Flash, DVR, CD, DVD, VHS	YES	YES	YES	YES	YES	YES

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See ad page 73	Forbest Products Co. 315 Harbor Way, Ste. B, South San Francisco, CA 94080 650-757-4786 www.forbestusa.net forbestusa@gmail.com	Forbest	1/2" to 36"	65' to 380'	Flash Drive, SD Card						YES
See ad page 70	M Tech 7401 First Place, Cleveland, OH 44146 800-362-0240 440-646-0996 Fax: 440-646-9953 www.mtechcompany.com sales@mtechcompany.com	CUES	2" to 96"	100' to 2000'	HDD, Flash Drive/USB Thumb Drive, SD Card, DVR	YES	YES	YES	YES		YES
See ad page 37	MyTana Mfg. Co., Inc. 746 Selby Ave., St. Paul, MN 55104 800-328-8170 651-222-1738 Fax: 651-222-1739 www.mytana.com mytana@mytana.com	MyTana	1 1/2" to 12"	100' to 400'	HDD, Flash Drive/USB Thumb Drive, SD Card, Compact Flash, DVR, DVD	YES	YES		YES		YES
See ad page 33	Pearpoint, Radiodetection/SPX 39-740 Garand Ln., Ste. B, Palm Desert, CA 92211 800-688-8094 760-343-7350 Fax: 760-343-7351 www.spx.com crystal.machado@spx.com	Pearpoint, Radiodetection/SPX	2" to 120"	100' to 500'	Flash Drive/USB Thumb Drive, Compact Flash, DVD	YES	YES	YES	YES	YES	YES
See ad page 31	PIPELOGIX PO Box 14014, Palm Desert, CA 92255 866-299-3150 760-779-1700 Fax: 760-406-6023 www.pipelogix.com joan.stone@pipelogix.com	Pipelogix Software			HDD, CD, DVD	YES					
See ad page 29	Prototek Corporation PO Box 1700, Poulsbo, WA 98370 800-541-9123 360-779-1310 Fax: 360-779-1510 www.prototek.net prototeksales@prototek.net	Prototek									YES
See ad page 59	RapidView IBAK North America 1828 W Olson Rd., Rochester, IN 46975 800-656-4225 574-224-5426 Fax: 574-223-7953 www.rapidview.com info@rapidview.com	RapidView IBAK North America	2" to 200"	100' to 2000'	HDD, Flash Drive/USB Thumb Drive, SD Card, Compact Flash, DVR, CD, DVD, VHS	YES	YES	YES	YES	YES	YES
See ad page 11	Rausch Electronics USA, LLC 4757 Innovation Way, Chambersburg, PA 17201 877-728-7241 717-709-1005 Fax: 717-709-1009 www.rauschtv-usa.com reusa@rauschusa.com	Rausch	5 1/2" to 60"	1000' to 1700'	HDD, Flash Drive/USB Thumb Drive, SD Card, Compact Flash, DVR, CD, DVD, VHS	YES	YES	YES	YES	YES	YES
See ad page 74	RIDGID 400 Clark St., Elyria, OH 44145 888-743-4333 Fax: 440-329-4862 www.ridgid.com	SeeSnake	3/4" to 12"	30' to 325'	Flash Drive/USB Thumb Drive, SD Card, Compact Flash, CD, DVD	YES	YES				YES
See ad page 45	Ritec GmbH Hojen 22 D-87490 Haldenwang, Germany +0049 8374 24060-0 Fax: +0049 8374 24060-60 www.ritec-tv.de info@ritec-tv.de	Ritec	0.6" to 48"	1.2' to 2.12'	Flash Drive/USB Thumb Drive, SD Card, DVR, CD, DVD	YES	YES	YES	YES		YES
See ad page 39	RS Technical Services, Inc. 1327 Clegg St., Petaluma, CA 94954 800-767-1974 707-778-1974 Fax: 707-769-8806 www.rstechserv.com sales.info@rstechserv.com	RS Technical Services	2" to 200"	100' to 3000'	HDD, Flash Drive/USB Thumb Drive, SD Card, Compact Flash, DVR, CD, DVD, VHS	YES	YES	YES	YES	YES	YES
See ad page 21	Spartan Tool, LLC 1506 W. Division St., Mendota, IL 61356 800-435-3866 815-539-7411 Fax: 888-876-2371 www.spartantool.com customerservice@spartantool.com	Spartan Tool PROvision Touch	2" to 8"	100' to 200'	Flash Drive/USB Thumb Drive	YES	YES	YES	YES		YES
See ad page 70	TV Ferret Inc. 840 State Rte. 50, Burnt Hills, NY 12027 518-399-2211 www.tvferret.com info@tvferret.com	TVFerret	2" to 102"	100' to 1500'	DVR	YES	YES	YES	YES	YES	



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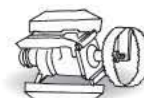
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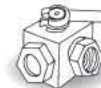
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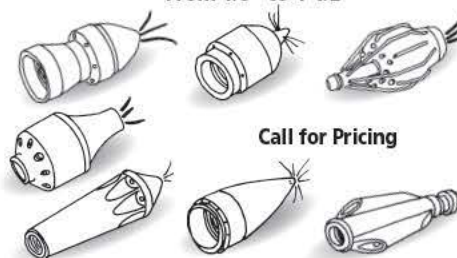
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FOSTERING ACCOUNTABILITY IN THE WORKPLACE

Managers should strive to create environments that engage employees and bring out their best

By Ken Wysocky

Ask 50 different people what it means to have an accountable workforce, and you could very well get 50 different answers, covering the gamut from creating well-defined job descriptions and establishing measurable goals to promoting only deserving employees and developing clearly outlined punishment for on-the-job failures.

What's not in dispute is the harm wrought by lack of accountability — things like ineffective work practices, quality control issues, high employee turnover, and customers lost due to poor service. In fact, a Gallup poll estimates that the lost productivity that stems from disengaged and unaccountable employees costs American businesses between \$287 and \$370 billion annually.

It's no small wonder that workplace accountability has become such a hot-button issue and the subject of numerous books, business columns and blogs. But before you start assessing employees with a RACI matrix (Responsible, Accountable, Consulted and Informed) or form "accountability centers" or try any of the other dozens of systems aimed at establishing workplace accountability, Paul Glen has a few words of sound advice: You can't force employees to be accountable, any more than you can force the proverbial horse to drink water.

What you can do, however, is create conditions under which employees are more likely to choose accountability. And punishment has nothing to do with it.

"To me, accountability is an interior state of mind in which employees feel personally accountable for their own productions and work," says the award-winning author, management consultant and chief executive officer of Leading Geeks Co. (www.leadinggeeks.com). "The underlying assumption is that fear of being punished is a great moti-

going beyond just telling employees the facts surrounding their jobs. Instead, provide a broader worldview that gives them a context from which they can see the importance of what they do.

As an example, he cites municipal sewer inspectors and maintenance workers. The basic facts of the job can be less than appealing:

"If you want people to be creative, they must be motivated to engage in their work, rather than be motivated to avoid a punishment. If employees are busy paying attention to punishment, they're not paying attention to their work."

Paul Glen

vator, and sometimes it is ... but ultimately, punishment is not a great motivator for knowledge work.

"If you want people to be creative, they must be motivated to engage in their work, rather than be motivated to avoid a punishment," he continues. "If employees are busy paying attention to punishment, they're not paying attention to their work. And if you're thinking through the lens of punishment to create accountability, you're already past the point where success is possible."

Foster an accountable environment

So if managers can't force employees to be accountable, what can they do? Glen says it's actually quite simple: Create an environment where accountability can grow. To do that, he offers three specific things managers can do:

1. Explain the meaning of work to employees. By this, Glen means

unglamorous working conditions in underground pipelines, dealing with sewage, repetitive tasks and so forth.

"But it becomes much more rewarding if they think about their jobs in terms of how they help maintain public health systems," he explains. "Consider the fact that the vast increase in human life spans from age 45 to the mid-70s is mainly due to effective plumbing, not antibiotics. Or think of people dealing with the aftermath of Hurricane Sandy. Most people don't think about how sewers work, but they're damn important."

2. Give employees control over their success and failure. Creating an environment where employees feel they're empowered to succeed or fail on their own merits is a powerful motivator for accountability. But they need to feel their performance is being fairly judged.

"For example, say you have a

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800/257-7222, or email editor@mswmag.com.



Paul Glen

municipal work crew that's unable to do its work until two previous crews finish their jobs," Glen says. "But that third crew is told their performance will be judged by the timeliness of the first two crews. People are wired for fairness ... they don't want to be punished because of someone else's mistake."

3. Provide employees a reasonable say in work evaluations. Giving employees a voice in what criteria is used to judge their work also increases buy-in for accountability. For instance, evaluating everyone in a municipal sewer cleaning department on how many feet of sewer they can clean per day, without taking into account that some stretches of sewer may be far more difficult to clean than others, might lead to disengaged employees who believe the playing field is uneven.

"But if I feel like I'm in control of my work and have input into the

criteria used to judge my performance ... then preconditions exist that foster my feeling of responsibility and accountability for my own work," Glen says.

It's all about people, not tasks

Why is lack of accountability so widespread? Glen theorizes that part of it may stem from the traditional manager's mindset that he or she is managing tasks, not people. They tend to think about employees as units of productivity — cogs in a machine — that must be punished if things don't go well.

But each employee's path to accountability is idiosyncratic, he notes. Some are driven solely by career advancement. Others are driven to help people. Still more are spurred to be accountable because they like their colleagues and don't want to let them down.

"So as a manager, you must create conditions under which most

people can find their path to accountability," Glen says. "I often relate it to the idea of gardening. The truth is, seeds will grow on their own, but you can create conditions that can help them grow. But even in a perfect greenhouse environment, some seeds still won't grow.

"Managers often have a sense of causality or power that's misplaced. They don't realize they have very modest access to the interior lives of people who work for them — their emotions, personal motivations and so on," he continues. "Many people respond differently to the same stimulus, so the actual cause and effect on their interior lives is much less than they'd like to believe.

"In fact, managers have more power to demotivate than to motivate," he concludes. "So the best you can do is create good conditions. After that, the employees must decide how to respond." ♦

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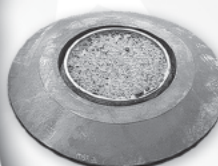
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Smith & Loveless releases pumping system catalog

Smith & Loveless released Pumping SOLUTIONS 4.0. The pumping systems catalog includes specifications, technical drawings and literature. The catalog can be ordered by calling 800/892-9122 or visiting the company website at www.smithandloveless.com.

Super Products produces capability guide

Super Products is offering a product guide for its Mud Dog hydroexcavator line. The guide provides a side-by-side comparison chart and detailed information on its 6.5-, 10-, 12- and 16-yard debris capacity units, as well as available options. A version of the guide can be viewed at www.superproductsllc.com.



Purafil hires water, wastewater market specialist

Purafil named Ni Wei, also known as Wills Ni, water-wastewater market specialist for Asia, serving as a central communication point for customers and manufacturing representatives relating to wastewater sales in China. His responsibilities will progressively include Southeast Asia, covering Japan and Korea.

Warren Rupp promotes vice presidents

IDEX Corp. and Warren Rupp promoted Bill Jones to vice president of operations, East Asia, promoted Shawn Fortune to vice president of supply chain and operations, and promoted Shane Wiltanger to director of operations, responsible for management of the Warren Rupp factory. Jones will be responsible for the IDEX Technology Services facility in Suzhou, China, and Fortune will be responsible for the manufacturing process, including the sourcing, purchasing and inventory management functions of Warren Rupp.

Electric Eel offers cable, tool selection guide

Electric Eel Mfg. Co. is offering a two-page guide for matching the right cable and cleaning tool for its line of drain and sewer cleaning machines. The guide is available at www.electriceel.com or by emailing info@electriceel.com.

CUES opens Midwest service branch

CUES opened a Midwest service branch at 2325 Parklawn Drive, Suite K, Waukesha, Wis. The facility includes drive-in service and loaner equipment inventory.



Xylem acquires Heartland Pump

Xylem acquired privately held Heartland Pump Rental and Sales. Heartland, based in Carterville, Ill., has been a partner with Godwin in dewatering pump rental, services and systems design since 1995. Godwin is part of the Xylem group. Heartland has 100 employees with branches in Indiana, Mississippi and Tennessee. Terms of the transaction were not revealed.

PSG opens China manufacturing facility

Pump Solutions Group opened a manufacturing plant in Shanghai, China. The 11,000-square-meter facility includes pump manufacturing and testing, a hydraulic lab for on-site product testing, a training room and a product showroom.



FCI releases CD product, services catalog

The FCI flow/level measurement product and services catalog CD from Fluid Components International assists engineers in specifying the correct flow, level or temperature instrument for improving plant process control lines or increasing OEM equipment performance. The catalog is available at www.fluidcomponents.com/cd.

IPR hires business development manager

Inland Pipe Rehabilitation hired Scott Pannell as business development manager for its southeast region, including the Carolinas, eastern Tennessee and southern Virginia. He has 20 years experience in sales, marketing and management within the civil engineering products industry.

Mueller Systems, Internap form partnership

Mueller Systems, provider of water infrastructure products and advanced metering systems for water and gas, partnered with hosting services company Internap to provide reliable and secure access to metering data through the advanced metering infrastructure network.

SJE-Rhombus names Thomas CEO

SJE-Rhombus named David Thomas chief executive officer, replacing Laurie Lewandowski, who retired. Thomas had been president/director of Standard Products. Lewandowski joined the company 31 years ago, serving as president, vice president of marketing, purchasing director and IT director. She has seen the company grow from a garage assembly operation to a global business with six locations and 100-percent employee ownership.



David Thomas



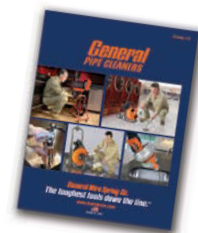
Laurie Lewandowski

Trimble, Bentley form alliance

Bentley Systems, an infrastructure software company, and Trimble, provider of connection construction for building contractors, formed an alliance to further the connection between the virtual and physical environments for infrastructure projects.

General Pipe releases product catalog

General Pipe Cleaners released a catalog of its power and manual drain cleaning equipment and accessories for clearing lines from 1 1/4 to 10 inches in diameter. The catalog can be viewed at www.drainbrain.com/catalog.



Hino approved for California hybrid incentive

The 2013MY Class 5 195h diesel electric cabover from Hino Trucks is approved by the California Air Resources Board and eligible for the California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) for the deployment of hybrid and zero-emission medium- and heavy-duty vehicles and vehicle technologies.

TRIC Tools names municipal sales director

TRIC Tools named Bob Greiner as director of municipal sales. He has 20 years of engineering, sales and management experience.

Mesa Water hires financial service manager

Mesa Consolidated Water District, Costa Mesa, Calif., hired Roger J. Galli as financial services manager. He is responsible for the district's \$37 million budget, accounting and budget preparation, financial reporting, investments, purchasing and payroll.

Singer Valve opens China factory

Singer Valve opened a factory in China and hired Li Jun as general manager. The 20,000-square-foot plant, located north of Shanghai, manufactures control valves for the water and construction industries in China, Malaysia and UAE.



Perma-Liner epoxy passes chlorine test

Perma-Liner formulated epoxy passed testing for chlorine resistance. Conducted by HTS Pipe Consultants, testing was performed in accordance with ASTM F1216, ASTM D543, ASTM D2122 and ASTM D770 methods. ♦

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PEOPLE/AWARDS

The California Stormwater Quality Association presented the City of Santa Barbara with the Outstanding Stormwater Research Project Award for the Water Environment Research Foundation funded study Canine and Microbial Source Tracking.


Matt Lake, executive director of the Merrillville Stormwater Utility, received the Excellence in Stormwater Management Award from the Indiana Association for Floodplain and Stormwater Management.

The Village of Downers Grove's 2nd and Cumnor Stormwater Improvements and Naturalized Basin Project received the Illinois Section of the American Society of Civil Engineers' 2012 Outstanding Civil Engineering Achievement Award Under \$5 Million.


The City of Elk Grove's Rain Garden Plaza received the Outstanding Sustainable Stormwater Project Award from the California Stormwater Quality Association.

Los Angeles Sanitation-City of Los Angeles received the Outstanding Stormwater Best Management Practice Implementation Award from the California Stormwater Quality Association for its Garvanza Park Stormwater BMP Project.

MSW welcomes your contribution to this People/Awards listing. Please send notices of new hires, promotions, service milestones, certifications or achievements to editor@mswmag.com




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Feb. 10-14

National Utility Contractors Association Convention, Sheraton Phoenix Downtown Hotel, Phoenix, Ariz. Call 703/358-9300 or visit www.nuca.com.

Feb. 24-March 8

Water Environment Federation 2013 Water & Wastewater Leadership Center; University of North Carolina Kenan-Flagler Business School, Chapel Hill, N.C. Visit www.wef.org.

Feb. 25-28

Pumper & Cleaner Environmental Expo International, Indiana Convention Center, Indianapolis. Call 866/933-2653 or visit www.pumpershow.com.

March 10-13

Water Environment Federation/American Water Works Association Utility Management Conference 2013, Renaissance Phoenix Glendale Hotel & Spa, Phoenix, Ariz. Visit www.wef.org.

April 7-10

American Public Works Association North American Snow Conference, Charlotte Convention Center, Charlotte, N.C. Visit www.apwa.net.

LEARNING OPPORTUNITIES

American Society of Civil Engineers

The ASCE has these courses:

- Feb. 14-15 – Pumping Systems Design for Civil Engineers, Charlotte, N.C.
- March 7-8 – Leadership Development for the Engineer, Chicago
- March 7-8 – NPDES Stormwater Permit Compliance, Pittsburgh
- March 7-8 – Stormwater BMPs That Work: Effective Analysis, Design and Maintenance, Chicago
- March 12 – Stormwater BMPs: What Works, What Doesn't and What About Maintenance, online
- March 14-15 – Financial Management for the Professional Engineer, Secaucus, N.J.
- March 14-15 – Pumping Systems Design for Civil Engineers, St. Louis, Mo.

Visit www.asce.org.

American Water Works Association

The AWWA will hold a Financial Management: Cost of Service Rate-Making seminar April 22-24 in San Diego, Calif. Visit www.awwa.org.

Wisconsin

The Wisconsin Department of Natural Resources has a Government Affairs seminar on Feb. 28 in Middleton. Visit <http://dnr.wi.gov>.

The University of Wisconsin Department of Engineering-Professional Development has these courses:

- April 8-9 – Using WinSLAMM v.10: Meeting Urban Stormwater Management Goals, Madison
- May 1-3 – Using HEC-HMS to Model Watersheds, Madison
- May 6-8 – Using HEC-RAS to Model Bridges, Culverts and Floodplains, Madison

Visit www.epdweb.engr.wisc.edu. ♦

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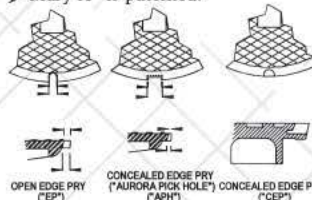
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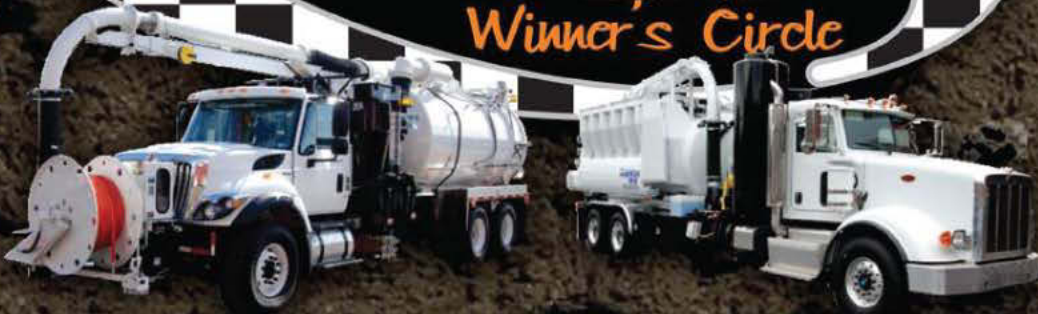

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