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February 2010

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# OPEN TO SUGGESTION

An Idaho  
desert town  
applies a wide  
variety of trenchless  
technologies

PAGE 24

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# INSIDE:

2010 EXPO PRE-SHOW ISSUE/EXHIBIT PREVIEW



## COVER:

SprayWall structural polyurethane coating from Sprayroq Inc. is just one of many rehabilitation technologies used in Nampa, Idaho. The city constantly looks for and tests trenchless technologies that help answer rehabilitation challenges. (Photography by Steven C. Jeffs)



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2010 Pumper & Cleaner Environmental Expo Show Issue

- ◆ Sewer: Fighting blockages in Cedar Rapids, Iowa
- ◆ Water: Award-winning maintenance in Marietta, Ga.
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- ◆ Human Side: Finer points of job interviews

FEBRUARY 2010

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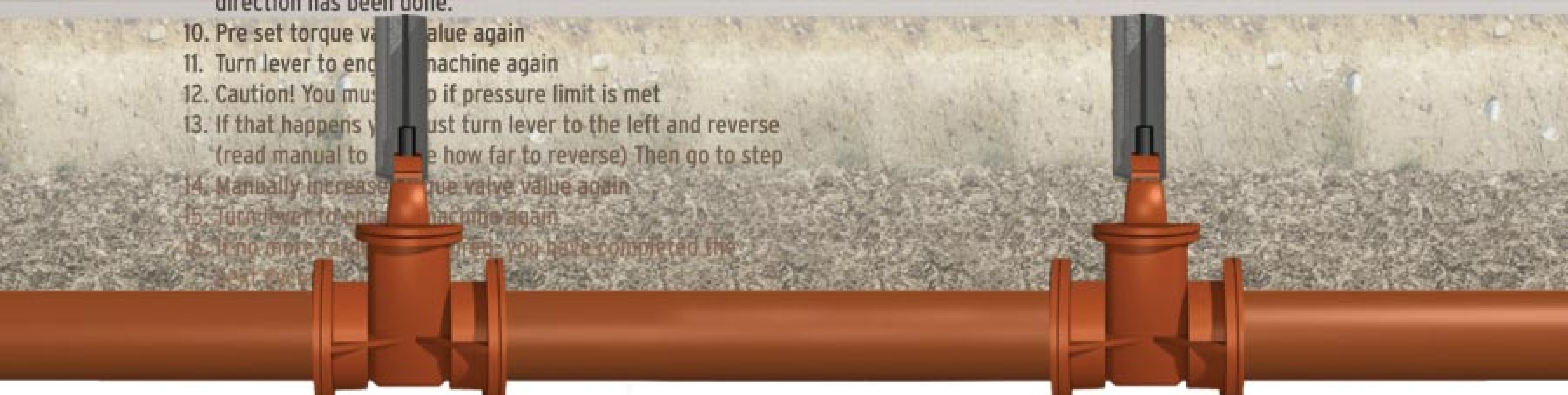
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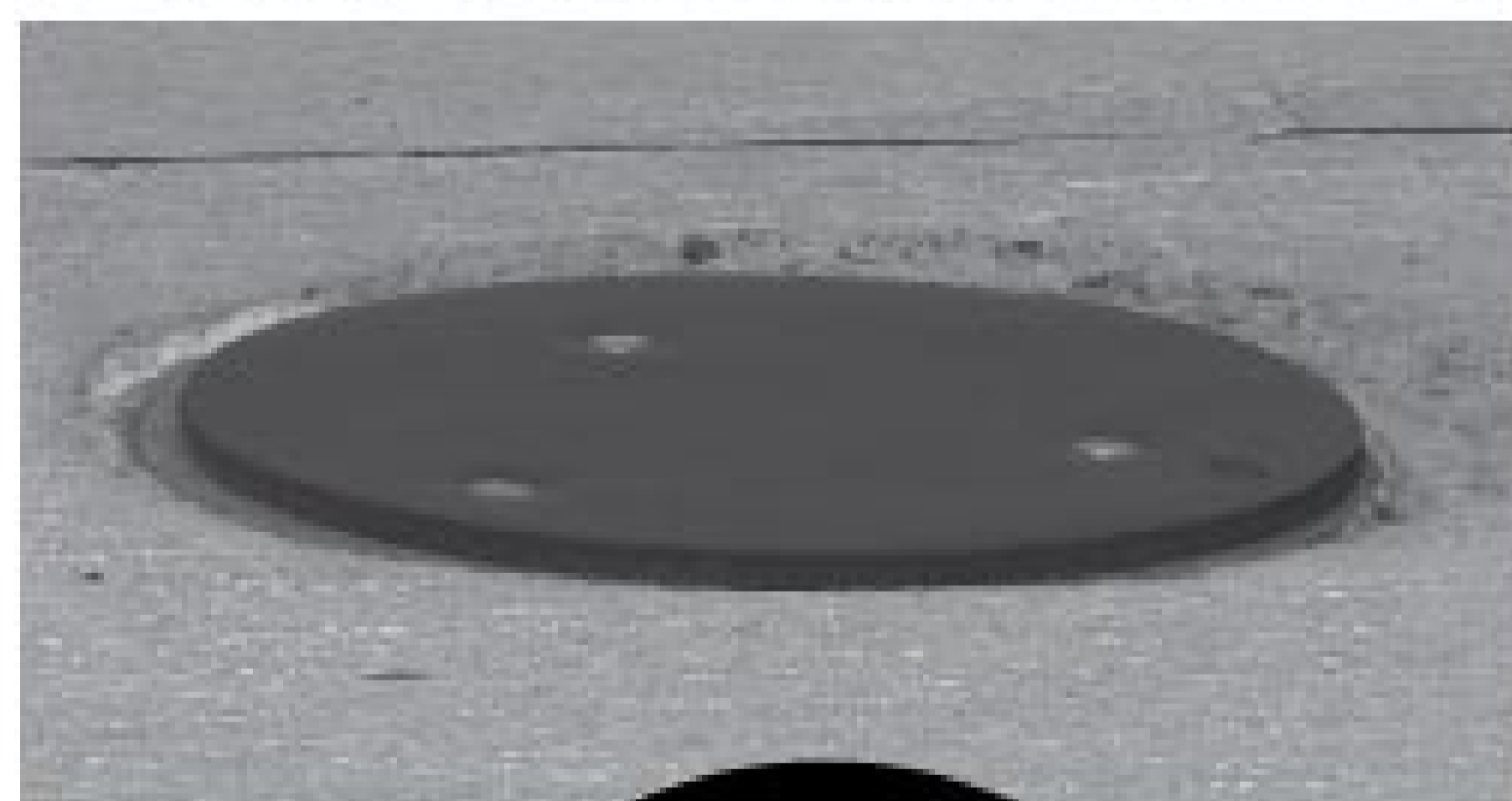
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# THOUGHTS ON CERTIFICATION

Wastewater agencies find that certification initiatives pay dividends in more knowledgeable, more engaged and more effective team members

A few months ago in this space I invited readers to share thoughts on certification for wastewater collection system operators. The topic got a warm reception: It appears that managers of collection departments see value in certification. Here are a few of the responses we received.

## Toward a career

David Bryant, wastewater collection supervisor with Palm Bay (Fla.) Utilities, says his operation is covered under the Florida Water & Pollution Control Operators Association. The certifications are:

- One year, Level C
- Three years, Level B
- Five years, Level A.

"They are voluntary, yet they provide a valuable resource to our crew, often teaching greenhorns that this isn't just a job, but could become a career with a little bit of work," says Bryant. "Our city would like to see a scenario in which employees could move themselves up the ladder,

**"Certifications are voluntary, yet they provide a valuable resource to our crew, often teaching greenhorns that this isn't just a job, but could become a career with a little bit of work."**

**David Bryant**

so to speak, by obtaining certain certifications or qualifications. Maybe one day...

"We require our mid-level employees, camera truck operators, foremen, and others to obtain a Level B certification and our supervisors and superintendents to have an A license.

"Although entry level requires nothing, we encourage all employees to at least pursue a Level C certification. The city pays for all books and certification and allows people to attend the week-long short school on the clock. The city

also provides transportation, hotel and per diem if required."

In addition, the city offers a one-time reimbursement/bonus of \$100 for obtaining each license. "My section has 19 employees: two A operators, one B operator, and eight C operators," says Bryant. "I have three more employees who became eligible to take the C exam in December."

## Help with exams

At Clayton County (Ga.) Water Authority, Charles Ecton, wastewater maintenance coordinator, worked with his team to help more operators earn certification.

"While developing our CMOM program in 2002, we noticed that only a few out of our 38 employees held state certification for the operation of the collection system," Ecton reports. "This certification was not required by the state or by our company.

"Many of our employees had taken the state exam, but they were not having a great deal of luck passing. We decided to start a voluntary after-hours study group to build confidence and strengthen our test-taking skills by working together in a collaborative environment.

"We would take sample tests, then round-table the answers, bringing our individual skill sets and job-specific knowledge into the discussions, since we all performed different tasks and worked on separate crews, such as manhole raising, jet truck operation, and CCTV inspection.

"Our first class had seven students, and five of them passed the exam. We improved the class based on input from the first group and continued to schedule classes, focusing on specific test dates. Our results have been outstanding, and the class has really paid off. Now



## FROM THE EDITOR

*Ted J. Rulseh*

100 percent of our foremen and 90 percent of our crew leaders are certified.

"The results have been so positive that we have been allowed to conduct the class during work hours, and upon receiving a state license the employee receives a five percent salary increase.

"The increase in certified employees has led to better buy-in to the CMOM effort and has increased overall job knowledge. The increase in confidence and performance has been a major contributing factor for our section winning the Georgia Association Of Water Professionals Collection System Of The Year for 2005 and 2007."

## Valuable knowledge

In Lucas County, Ohio, sanitary engineer James P. Shaw III, P.E., observes, "Our water and sanitary sewer utility maintenance staff has position descriptions that allow the employee to pass a course in water distribution and wastewater collection systems through the Operator Training Committee of Ohio to advance to a higher level of pay.

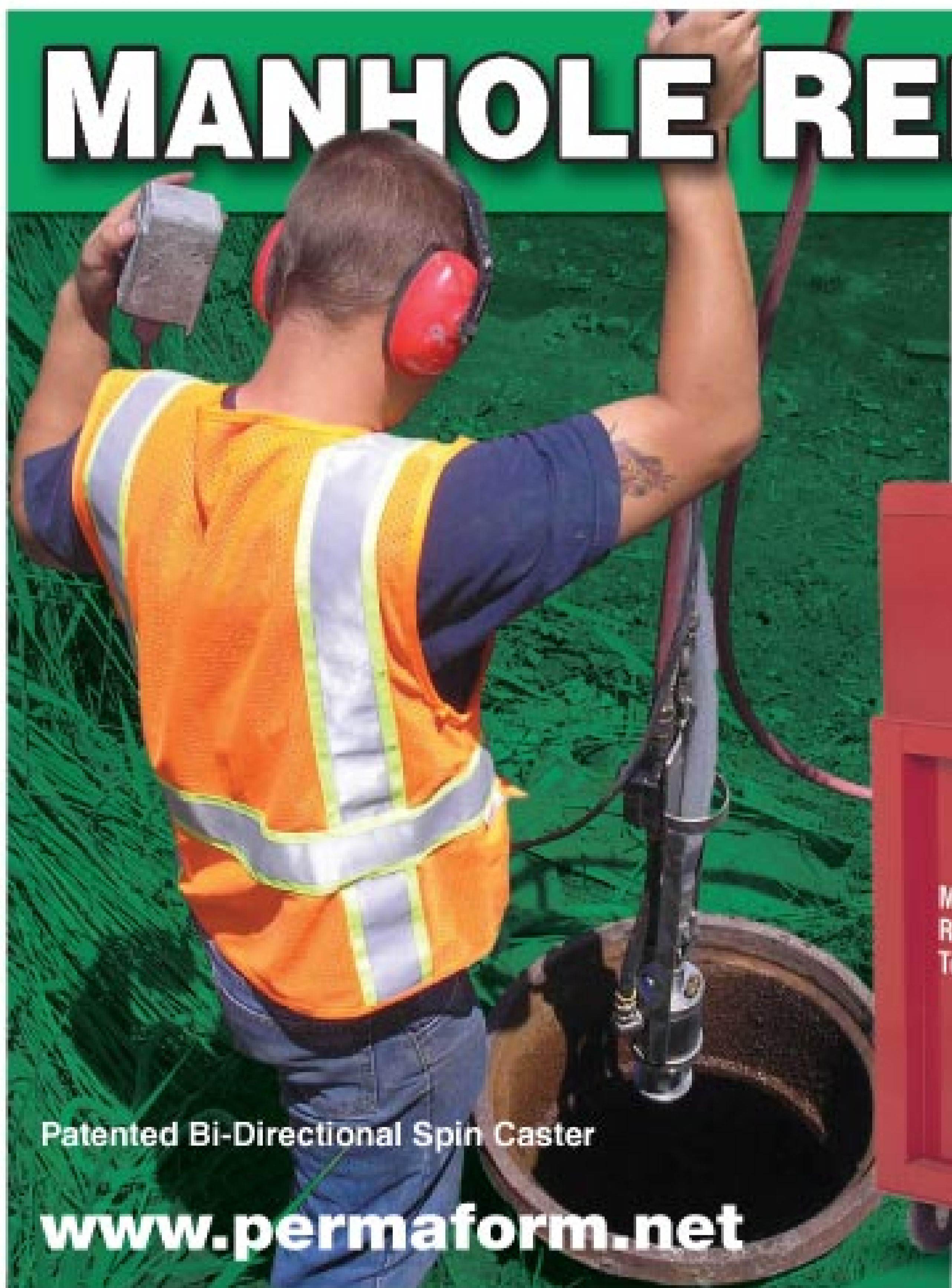
"This also prepares the employees to take the state licensing tests. Our staff has gained significant knowledge that allows them to provide ideas on the type of equipment we use and how to use it. This translates to a more productive and efficient staff with increased pride in work performance. The courses are based on the Sacramento books."

## At the state level

In Indiana, Gary Merriman and co-worker Brian Miller from the City of Fort Wayne administer voluntary collection system certification in a program managed through the Collection Systems Committee of the Indiana Water Environment Association.

"At the present time, we have 350 certified operators holding Class 1 through 4 certificates,"

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says Merriman, whose full-time role is construction program manager in the city's Water Pollution Control Maintenance Department.

"Since the state doesn't recognize continuing education credits for collection system certificates, they are without expiration, and no renewal program is in place. Our exams are provided and graded by The Association of Boards of Certification in Ames, Iowa. The cost of an exam pays for the exam itself and the ABC membership dues. The majority of the people who take the exam do it because they have pay incentives based on the

**"The increase in certified employees has led to better buy-in to the CMOM effort and has increased overall job knowledge. The increase in confidence and performance has been a major contributing factor for our section winning the Georgia Association Of Water Professionals Collection System Of The Year for 2005 and 2007."**

Charles Ecton

class certification they hold.

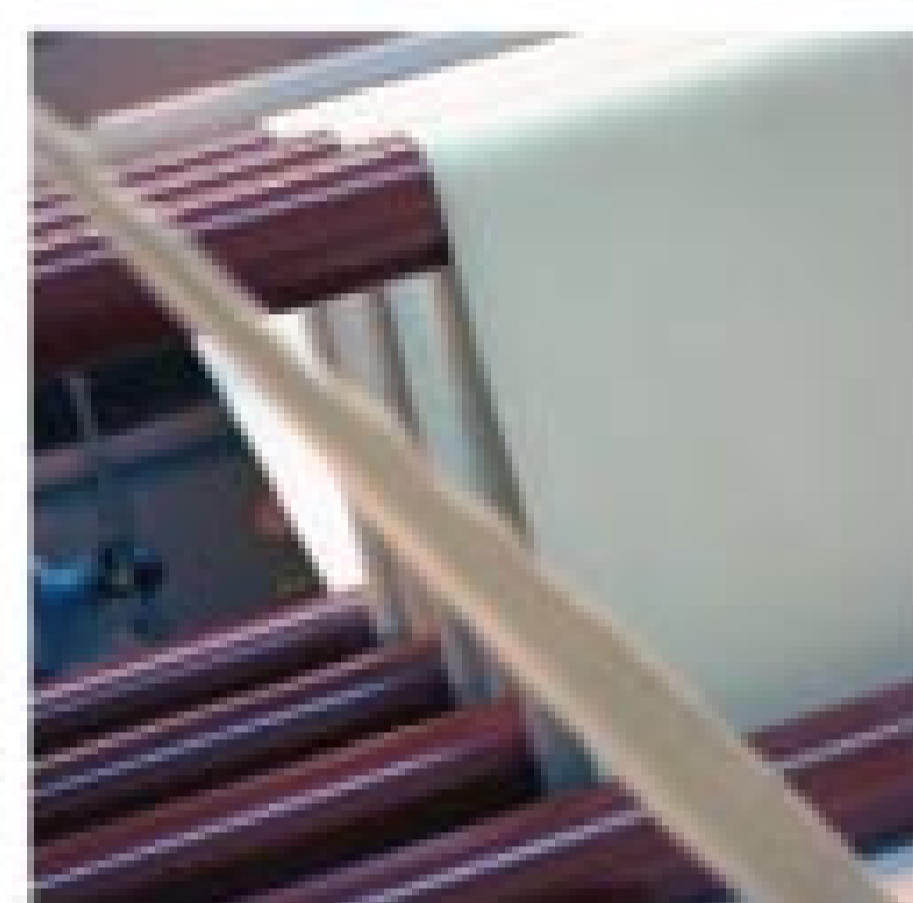
"In the case of the people I supervise in Fort Wayne, 45 of 59 union employees hold certificates, and 28 of them have Class 4. Besides earn-

ing extra money for the certificate, they use the knowledge they gain from studying for the exam in the operation and maintenance of our sewer collection system, which is over 2,000 miles."

Certification seems to be gaining ground within progressive wastewater utilities and departments. Thanks to those who shared their insights. Keep those cards and letters coming. ♦

Comments on this column or about any article in this publication may be directed to editor Ted J. Rulseh, 800/257-7222 or [editor@mswmag.com](mailto:editor@mswmag.com).

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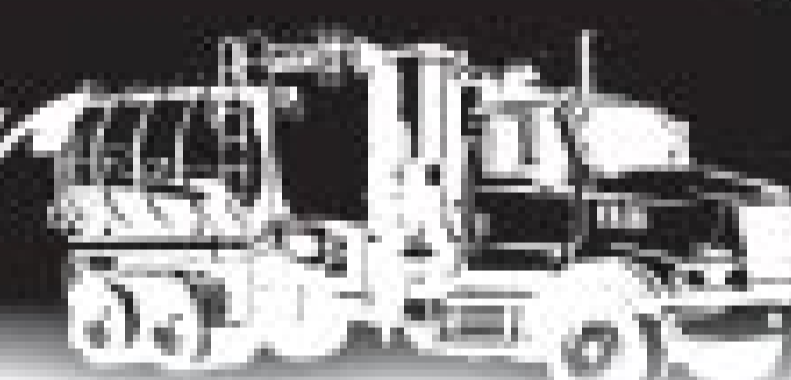


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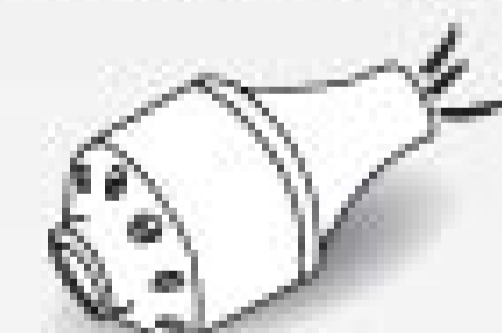


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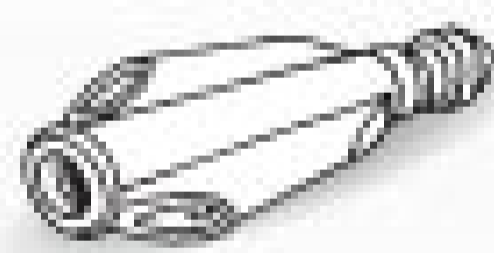
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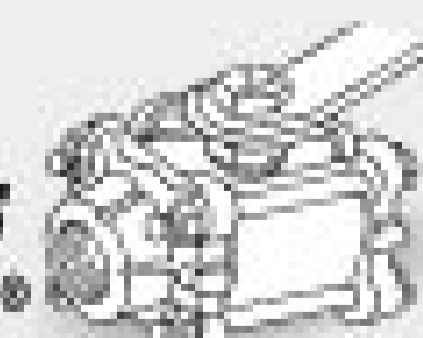
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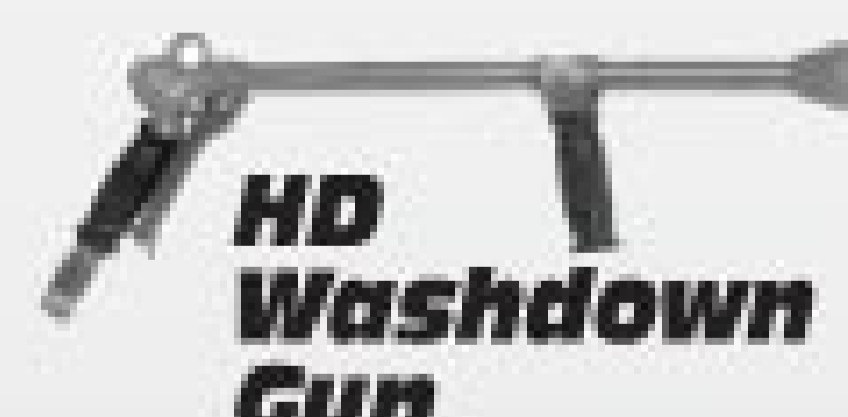
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Patrick Hennessy (left) and David Silvestri, with the biofuel program of the San Francisco Public Utilities Commission, collect oil from a local restaurant that will be turned into biofuel. The hose is connected to a special cooking oil collection truck. (Photography by Lezlie Sterling)

## FOCUS: SEWER

# SAN FRANCISCO FIGHTS FOG

A progressive program helps keep fats, oils and grease out of sewers, while a new technology turns it into high-quality fuel for use or sale

By Mike Larson

**F**OG can be a big problem in San Francisco — not the misty kind that famously blankets the City by the Bay, but sewer-clogging fats, oils, and grease. FOG is a sticky problem for the San Francisco Public Utilities Commission (SFPUC), largely because of the many restaurants for which the city is known.

The men and women of SFPUC fight to keep FOG out of the city's 1,000 miles of combined sewers, which carry 80 mgd of wastewater. They clean out gooey plaque that causes blockages. They

clean up FOG-caused sewage backups and overflows. They fix sections of sewer broken as a result of clogs and backups. And they try to convince residents and business owners to take steps to avoid dumping FOG into the system.

And now, the commission uses a new technology to convert grease collected from commercial grease traps into high-quality fuels. The technology produces ASTM-certified biodiesel fuel, a renewable, nontoxic fuel that can be used in any diesel application, from vehicles to household furnaces, without modifying the machinery.

It's all part of a new, comprehensive FOG-control program that the commission expects to help reduce sewer blockages, save on emergency responses and cleanups, and keep costs down for ratepayers.

### Good food, bad clogs

Collection System Division manager Lew Harrison says his department handles about 9,000 work orders each year, about 6,000 of them related to sewer blockages, of which 44 percent are caused by grease. All told, the city spends about \$3.5 million per year on grease-related blockages, and that



**PROFILE:**  
San Francisco, Calif.,  
Public Utilities  
Commission

**POPULATION SERVED:**  
1.5 million

**AREA SERVED:**  
49 square miles

**WASTEWATER FLOW:**  
80 mgd

**EMPLOYEES:**  
482 (wastewater system)

**INFRASTRUCTURE:**  
1,000 miles of combined  
sewer; 23,000 catch basins

**ANNUAL BUDGET:**  
\$132 million

**WEB SITE:**  
[www.sfwater.org](http://www.sfwater.org)



**Above: The cooking oil collection truck at a San Francisco restaurant. Left: Patrick Hennessy pours used cooking oil into a barrel on the loading dock of the biofuel facility.**



low the best anti-FOG practices and that isn't equipped with a well-maintained grease trap can send an enormous amount of FOG down the drain every day.

Multiply that by hundreds of restaurants, and the volume of FOG flushed into the sewers adds up in no time. Harrison estimates that 9 million gallons of FOG enters the San Francisco sewer system daily. Once there, it cools, solidifies, clings to the sewer walls, and slows the flow of wastewater.

When wastewater moves slowly,

**“San Francisco has more than 2,600 restaurants packed into a relatively small geographic area bounded by water on three sides. I’ve been told the city is home to more restaurants per capita than anywhere else in the country.”**

**Lew Harrison**

doesn't include the cost to private businesses and homes.

One reason FOG has been such a challenge is the city's appreciation of good food. “San Francisco has more than 2,600 restaurants packed into a relatively small geographic area bounded by water on three sides,” says Harrison. “I've been told the city is home to more restaurants per capita than anywhere else in the country.”

In any city, restaurant food preparation, cooking, and cleanup generate the vast majority of the FOG. A restaurant that doesn't fol-

or stops, odors build up. Eventually a heavy blockage causes sewage to back up into streets, commercial buildings, and houses, causing health hazards and costly cleanups and repairs.

### Keeping FOG out

The best way to avoid FOG problems is to keep the material out of the sewers. Six years ago, SFPUC started a program to stop FOG at the main source: restaurants. The emphasis is on encouraging owners to collect and recycle as much FOG as possible.

As a first line of defense, restaurants can collect fryer oil in containers. They can also clean pots and pans of grease with rubber scrapers before washing, and collect the scrapings for disposal in the trash.

The next preventive measure is to have a designated sink for washing greasy or oily items, and having that sink drain into a grease trap inside or a grease interceptor outside. Both devices work well if maintained properly and cleaned frequently.

Keeping FOG out of the sewer means extra work and extra cost for a restaurant, so a successful anti-FOG program includes tools to educate owners about how keeping FOG out of the sewers can reduce their risk of costly and unpleasant backups. For the city, eliminating FOG pays off in lower maintenance costs.

### Progressive approach

Although the U.S. EPA has mandated FOG pretreatment programs for years, San Francisco started its own largely voluntary program six years ago. In March 2009, the city stepped it up a notch by making participation mandatory for restaurants.

“We realized the financial and work-hour cost that FOG was causing,” says Harrison. “We knew we were spending millions of dollars



**Used cooking oil before and after processing into biofuel.**

## A VERSATILE TECHNOLOGY

The BlackGold Biofuels technology used in San Francisco is designed to convert even crude, low-quality fats, oils, and greases to biodiesel fuel.

The process creates fuel that meets all the requirements of the national biodiesel quality standard, ASTM D6751, while also addressing the challenges of converting brown greases, including deodorization and elimination of contaminants, says Emily Landsburg, CEO.

The process was designed for trap grease, which has free fatty acid (FFA) percentages that vary from 40 to 100 percent. This variability prohibits the use of a conventional acid-base biodiesel process, which would require labor-intensive inline modification or sustain high yield losses.

Feedstock flexibility enables the successful processing of brown greases, yellow greases, rendered fats, and virgin plant oils in the same process, whether individually or blended. For municipalities dealing with FOG, this means the process can be used for many FOG types.

The system also produces products besides biodiesel. One is biobunker, a bio-based equivalent to residual fuel oil that can be used for process heat, for supplementing biosolids incineration, or for sale. The third is glycerin, which can be used as a carbon source for denitrification or as a booster for gas production in anaerobic digesters.

Landsburg points to U.S. EPA tests that show how biodiesel made from waste grease reduces greenhouse gases by 80 percent compared with conventional diesel. She observes that whether stakeholders' interests are reducing fuel costs, cutting reliance on foreign oil, creating local green jobs, generating revenue, or reducing the carbon footprint, grease conversion can be a win for stakeholders across the board.

each year on a problem we could prevent if we approached it the right way.”

The city and the EPA already had some regulations that required restaurants to have fryer oil hauled away, and private haulers were filling that need. Some restaurants were also using grease traps or the larger and more expensive interceptors, but not all were having them serviced properly.

**“If this system catches on across the country with the general public, and people decide they want to have their food and grease waste used for fuel instead of landfill, we might someday be able to take the country’s entire wastewater industry off the grid.”**

**Low Harrison**

In an area known for environmental awareness and innovation, it seemed natural that the city would find an innovative and progressive solution to the problem. The FOG program combines restaurant operator education with carrot-and-stick regulations.

“You couldn’t find a better place in the country to try out this method,” says Harrison. “People here tend to support environmentally friendly practices and are also more open to unusual ideas than in some other places. But the reality is that no matter how altruistically motivated restaurant owners are, the system also has to make business sense, or they won’t embrace it.”

### Prevention first

The first prong of the FOG program is toughening up best-practice requirements, many of which had been voluntary. For example, restaurants are now required to dry-wipe pots and pans and monitor grease hauled away from their businesses.

The FOG program also includes an ordinance requiring restaurants being built or remodeled to install an automatic grease-removal device (AGRD) by 2012. Other restaurants must do so by 2015. Right now, such a system costs about

\$2,300. SFPUC estimates show that once the systems become more common, competition and volume manufacturing will drop the price to about \$1,500.

To help restaurants offset the cost and to help jump-start the FOG program, the city will cut sewer rates for restaurants that install or convert to AGRDs in the next two years. Harrison estimates that the reduced rates will let restaurant owners recover the cost of the AGRD in three years. Revenue the city loses from the lower rates will be offset by lower spending on emergency repairs and clearing of blockages.

The AGRDs will do more than trap the brown grease for conversion to biodiesel. They will also separate and collect food waste, which the city plans to convert to biogas through anaerobic digestion. The biogas will be compressed and used as fuel for vehicles.

### Waste to resource

Of more immediate benefit is the grease-to-biodiesel facility, which began producing fuel last November at the commission’s Oceanside Wastewater Treatment Plant. The system was installed there to take advantage of 24-hour staffing, heating systems, and existing transportation corridors.

The system, from BlackGold Biofuels in Philadelphia, Pa., receives grease trap waste delivered by pumping contractors who service restaurants. The pre-fabricated, skid-mounted system easily hooks into the treatment plant infrastructure.

To convert FOG into fuel, the BlackGold system starts by removing water, trash, and grit. It then uses methanol and a catalyst to chemically transform the grease into fuel. And an intensive purification phase follows.

The fully automated, continuous system requires little training to run and operates with minimal staff attention and training. The SFPUC awarded BlackGold sole-source status after the company won a selection competition that included a test conversion of multiple samples of San Francisco grease into biodiesel at the company’s Philadelphia pilot plant, the first of its kind in the country.

The SFPUC uses the biodiesel to fuel some of its vehicles. That

means the commission saves on fuel as well as on landfilling of grease. That in turn helps keep sewer rates down for restaurants and other customers.

“When you landfill grease, you are doing a good thing by keeping it out of the sewer where it causes problems,” says Harrison. “But you are still not doing anything useful with it. When you convert the grease to biofuel, you are making it into something beneficial, and you are also helping reduce the rate at which you use up another resource — petroleum. Ultimately, if you convert FOG to more biofuel than you need, a city could develop an income stream by selling it.”

The SFPUC believes grease haulers will be attracted to the BlackGold facility because discharging there costs less than landfilling, and because the site is closer to the central city, saving haulers



**Low Harrison, manager of the San Francisco Public Utilities Commission Wastewater Enterprise Collection System Division.**



**Karri Ving, coordinator of the San Francisco Public Utilities Commission biofuel program.**

money on fuel, bridge tolls and other expenses.

### Just the beginning?

Down the road, Harrison envisions even bigger benefits. At present, about 9 million gallons of brown grease are discharged into the system per day, and up to 5 million gallons is recoverable, he estimates.

As restaurants come on board, and as the commission gets better at using the recovered waste, Harrison believes enough eventually could be converted to biogas to help fuel the turbines that generate electricity at the wastewater treatment plant, ideally at some point making it self-sufficient.

“If this system catches on across the country with the general public,

and people decide they want to have their food and grease waste used for fuel instead of landfill, we might someday be able to take the country’s entire wastewater industry off the grid. That would cut the country’s energy needs by 3 percent.”

The first steps in that journey are taking place now as SFPUC ramps up its new FOG program. Says Harrison, “San Francisco wants to perfect this program, then help lead other cities out of the FOG.” ♦

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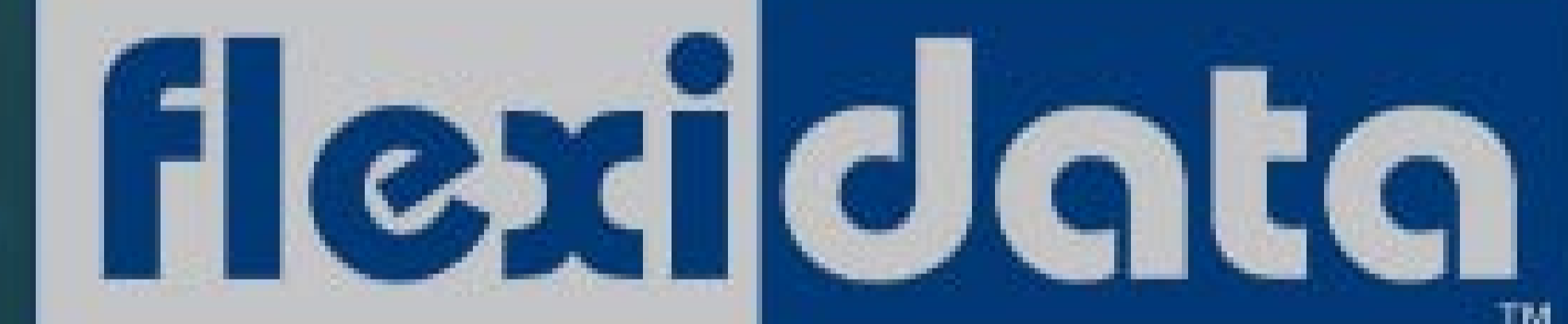


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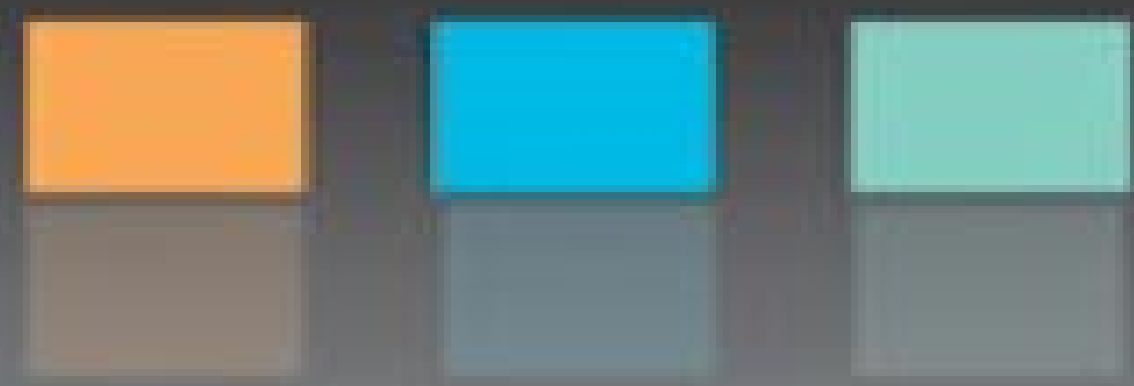
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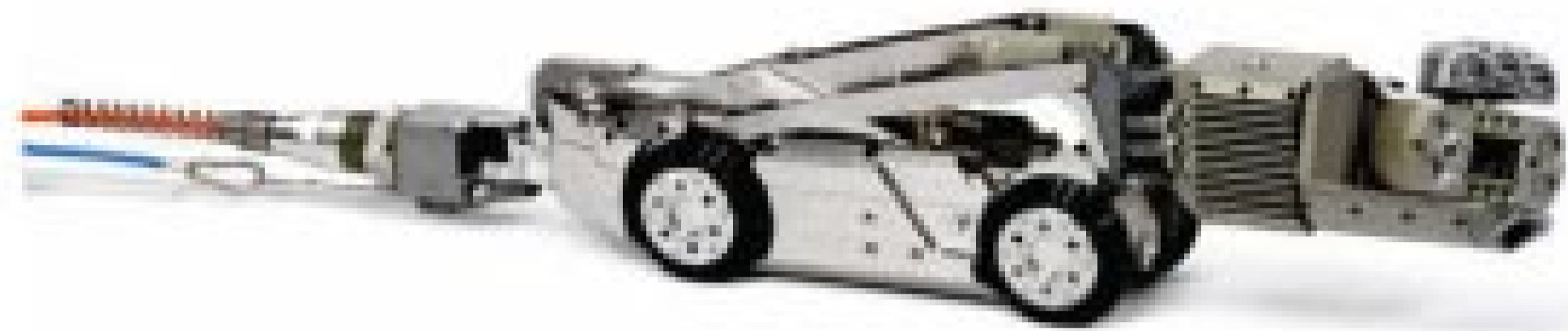


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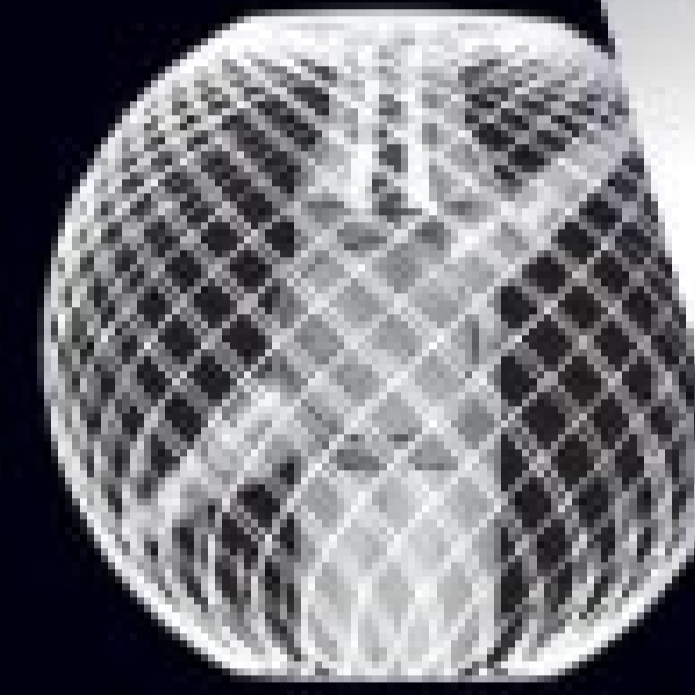
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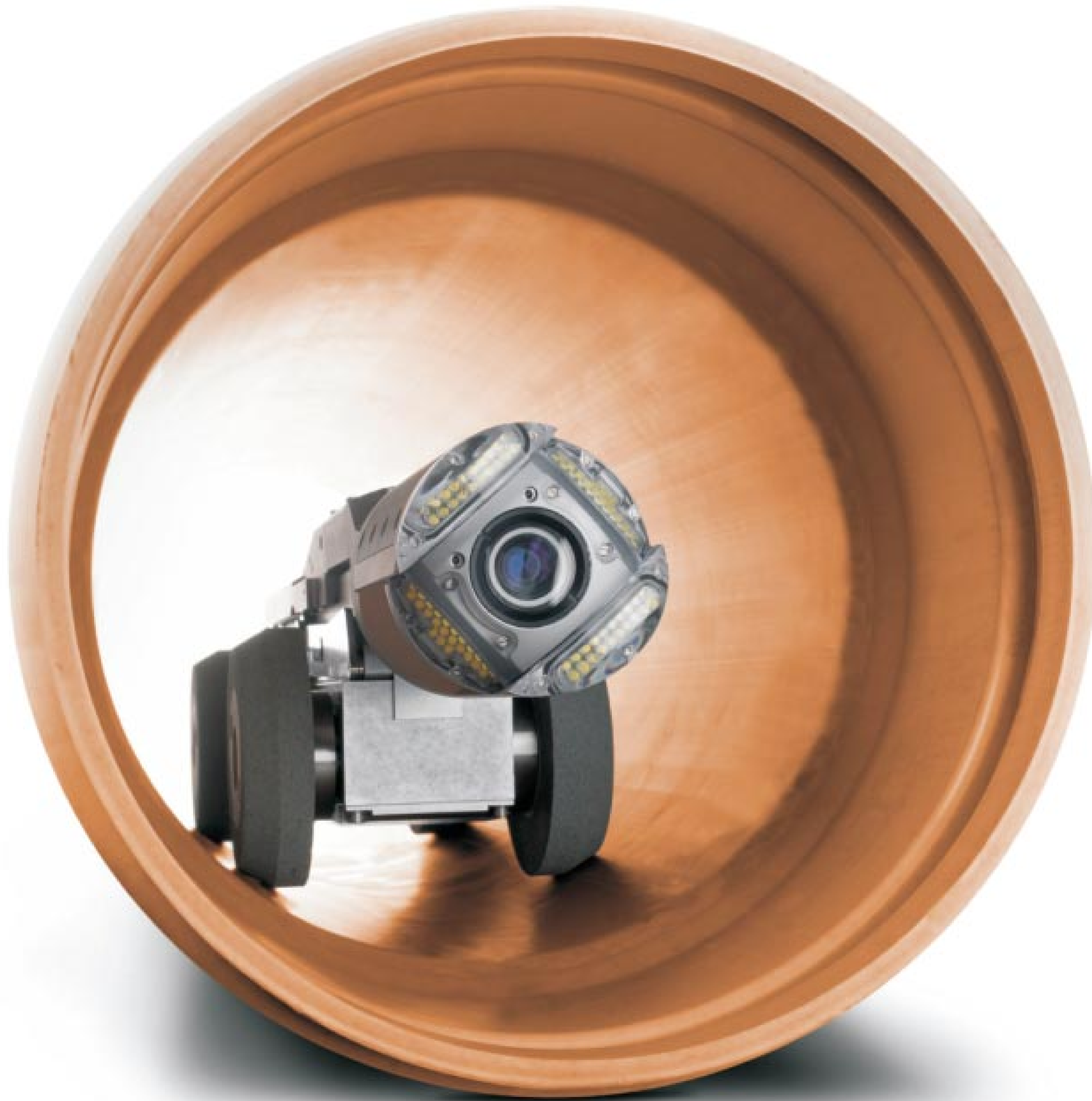
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# OPEN TO SUGGESTION

A town in the high desert of Idaho finds answers to its aging infrastructure challenges by studying and applying a wide range of trenchless technology approaches

By Suzan Marie Chin



Nampa technician Kristy Ruff refills a Vactor combination truck's water tank from a fire hydrant. (Photography by Steven C. Jeffs)

**T**renchless technology has opened up a world of opportunities for cost-effective wastewater infrastructure rehabilitation and life extension for the City of Nampa, Idaho.

By being open-minded and willing to consider new technologies, the city can effectively maintain its system on time and on budget and add more projects to its capital improvement program than it could complete using dig-and-replace methods.

"Once we discovered trench-

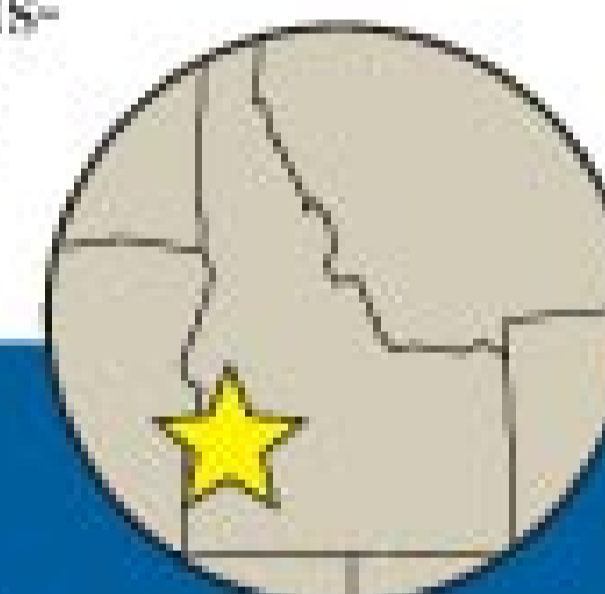
less technology, we couldn't help but realize and recognize the cost savings and the time savings," says Michael Creager, collection system technician II. "That's not to mention the reduction in inconvenience to neighborhood residents. All in all, it's a phenomenal deal compared to open-trench."

## Consistent maintenance

Nampa, population 82,000 (industrial customers create a population equivalent of 225,000), lies in a high desert region. Recent years have brought an inflow of new residents, expanding the wastewater collection system to EPA Class 4 level with more than 300 miles of sewer main, 12 lift stations and 6,000 manholes. Most mains are concrete, 6 to 42 inches.

Nampa has an established preventive maintenance program of cleaning and CCTV inspection, using an in-house crew with two Model 2100 combination trucks by Vactor Manufacturing, and two inspection rigs from CUES Inc. The inspection and cleaning crews work together on a two-and-a-half-year cycle through the system which is divided into sections.

To stay focused and organized, Nampa uses OASIS software by Hydrologics Inc. along with its ESRI GIS system to track and analyze cleaning and inspection. Unlike many cities that set up monthly or yearly goals, Nampa sets daily goals, scheduling some mainline cleaning, inspection and lift station maintenance tasks every day.



## PROFILE:

City of Nampa,  
Idaho Public Works,  
Wastewater  
Collection Systems

**POPULATION:**  
82,000

**INFRASTRUCTURE:**  
300 miles of sewer main,  
6,000 manholes,  
12 lift stations

**EMPLOYEES:**  
9

**ANNUAL BUDGET:**  
\$13 million

**WEB SITE:**  
[www.cityofnampa.us](http://www.cityofnampa.us)



Below, a CUES camera is deployed to inspect a section of mainline for infiltration. Right, technician Michael Creager lowers a camera and transporter into position.



**“Once we discovered trenchless technology, we couldn’t help but realize and recognize the cost savings and the time savings. That’s not to mention the reduction in inconvenience to neighborhood residents. All in all, it’s a phenomenal deal compared to open-trench.”**

**Michael Creager**

Although several of the city’s CCTV operators are certified in the NASSCO Pipeline Assessment and Certification Program (PACP) coding system, the city still uses its own coding on the grounds because it is less time-consuming for operators and does not compromise data quality.

Since some parts of the collection system are more than 100 years old, maintenance could only carry the system so far, and many components were nearing the end of their life cycles. So the hunt began for cost-effective rehabilitation methods that would offer the best return on investment and the least disruption to the community.

### **Obvious choice**

Trenchless methods were an obvious choice, and the city was willing to experiment with the new tools. Starting with linked pipe and working through cured-in-place pipe (CIPP), point repair, grouting, slip-lining, pipe bursting and spray-applied polyurethanes, Nampa tried

almost everything. “As trenchless technology has grown, we’ve remained open to any new ideas, as every project scenario could require a different method,” says Creager. “Keeping all options open has worked exceedingly well for us.”

Collection team members attend conferences to collect information, research and learn about emerging technologies. Nampa also relies on the input of one of its contractors, Scott Wendling of Pipeline Inspection Services, who actively pursues new technology and shares his findings with the city.

The most important criteria for choosing any technology are capital cost and cost savings based on the effectiveness and lifespan of the repair. Sometimes a single technology stands out, and at other times, a combination of methods proves to be the best solution.

Underneath one of the busiest intersections on the high-traffic Northside Boulevard, three line segments had areas of extreme erosion, resulting in 780 feet of

## **MAKING A CASE**

“One of the biggest challenges facing municipalities is imparting to others outside our industry the urgency in being preventive and proactive as opposed to reactionary and responding to emergencies,” says Michael Creager, collection system technician II for the City of Nampa.

Educating residents, city council members and other decision makers about the importance of rehabilitation and maintenance can be difficult, so public information officer Sharla Arledge enlisted the help of CCTV inspection data and the age-old rule of “a picture is worth a thousand words” to get the message across.

Creager compiled five hours of CCTV pipe survey video files and placed timeline marks where sections of pipe needing repair could be found. Arledge then extracted those sections and edited them into an engaging four-minute video for showing to city decision makers.

“The response was amazing,” says Creager. “It allowed them to see why we were asking for funds for repairs. They were quite shocked to see the condition of the system. It went a lot farther than someone telling them, ‘It’s bad and we need to replace it.’ Once they got over their disbelief, they could comfortably make the necessary decisions on expenditures and projects.”

The video presentation now serves multiple purposes. It is used as a key component for educating customers about a proposed rate increase to pay for repairs to the system. Residents can view the visual explanation and buy into the importance of caring for the infrastructure.

exposed aggregate that was creating high losses of flow and velocity. In addition, the associated manholes desperately needed repair.

For a traditional cut-and-replace of the mainlines and manholes, Nampa faced a four-lane road clo-

sure lasting some three weeks, plus high restoration costs for pavement, sidewalks and landscaping. The city chose CIPP lining from Insituform Technologies Inc., to repair the damaged sections. The repair took three days and caused

**“If we know a structure is in a high-risk situation, we will absolutely consider protective coating. The cost to protect as opposed to repair and rehabilitate down the road is much smaller. It’s just a smart economic move.”**

**Michael Creager**

minimal traffic disruption.

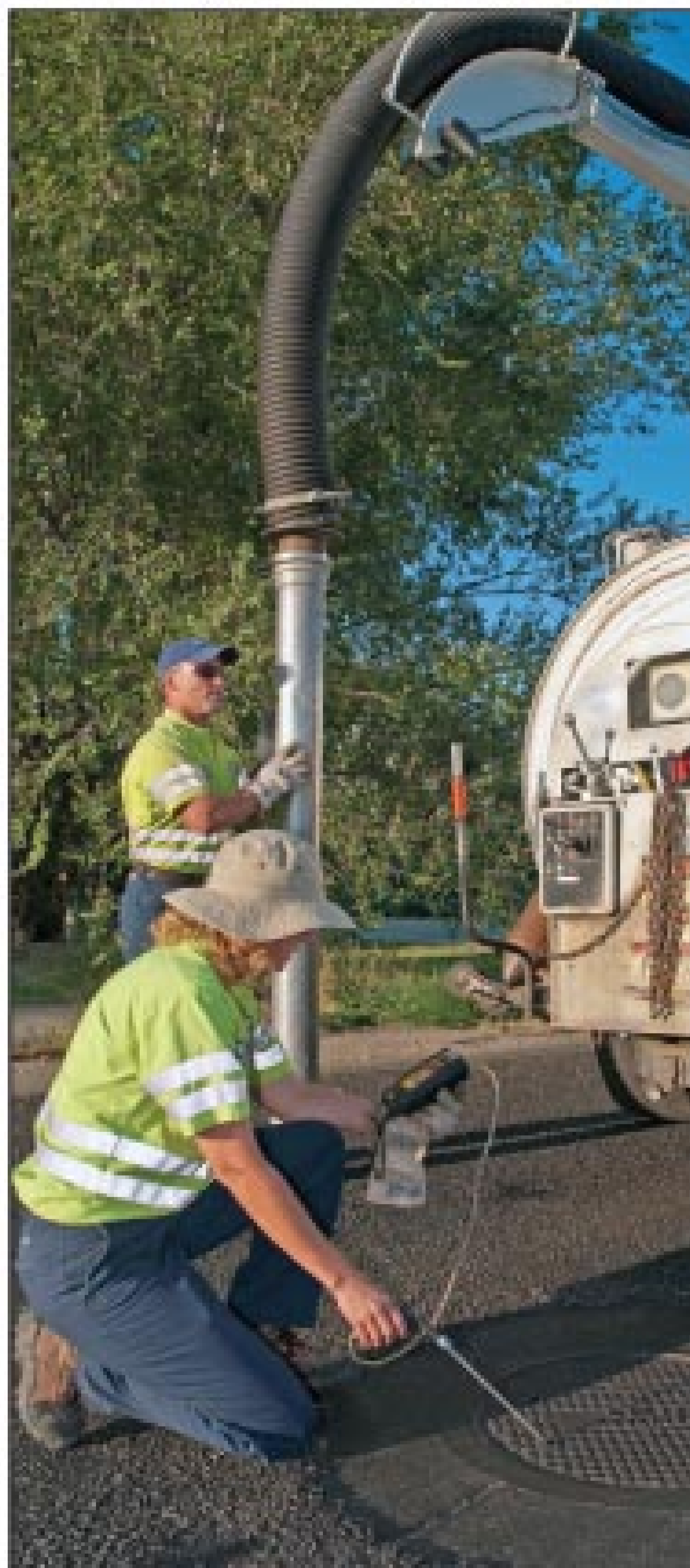
To address the manholes, the city hired Pipeline Inspection Services, which used various cementitious products from Quadex Inc. for rebuilding and patching. Once the structure surfaces were prepared, an application of SprayWall structural polyurethane coating from Sprayroq Inc. restored the manholes to brand-new condition.

### Smaller can be better

Slip-lining saved the day when Doug Jenkins, collection system supervisor, presented wastewater superintendent Greg Pearce with inspection footage of a 486-foot span of pipe that was failing directly underneath the I-84. Pearce consulted with an engineering firm about repair options, as the ground was high in lava rock and the location itself was challenging.

The engineering firm said a new bore under the highway would be needed at a cost of about \$500,000. Pearce decided to look

**Jeff Richmond and Kristy Ruff use a Vactor Model 2100 combination truck to dislodge and vacuum debris from a wastewater mainline.**



at slip-lining instead. The city obtained a flow meter and conducted a flow study for several weeks and found that the smaller slip-lined pipe would have the needed capacity. When an engineering firm confirmed the finding, the city moved forward. “We didn’t have to impede a single bit of traffic,” Pearce says. “And the repair was completed over one night, all for about \$40,000.”

With its positive experiences using trenchless technology on pipes and manholes, Nampa looked at using it on other structure rehabilitation and maintenance. One lift station was receiving a high flow from an industrial customer, causing a huge hydrogen sulfide odor problem. The flow was also causing rapid erosion in upstream manholes.

To mitigate the odor, Pipeline Inspection Services applied SprayWall polyurethane. It dissipated the odor, allowing the manholes to vent, as opposed to the porous base structure material absorbing and retaining the odor. The coating also prevents further erosion of the structure from the hydrogen sulfide.

“At the rate the manholes were deteriorating, we figured we’d have to go back in there in 12 to 15 years and rebuild them,” says Jenkins. “Because we coated them, 30 to 40 years from now we’ll still have good manholes that we may never have to replace.”

As a preemptive measure, when the manholes were coated, Nampa had the wet well associated with the lift station and two other manholes treated. The aim is to prevent further erosion and extend the lifespan of these structures against the industrial flow.

“If we know a structure is in a high-risk situation, we will absolutely consider protective coating,” says Creager. “The cost to protect as opposed to repair and rehabilitate down the road is much smaller. It’s just a smart economic move.”

### Endless potential

The list of applications for



**Juan Pena performs maintenance on a lift station grinder pump.**



**Cody Aberasturi (in white) applies SprayWall structural polyurethane coating from Sprayroq to a manhole, assisted by Anthony Johnson and Patrick Swenson.**

trenchless technologies is long, and the options will continue to grow. “With all the new technologies, outside of an extremely shallow repair, open-trench is our last resort,” says Creager. “We might be comfortable with the old ways, but we all need to let them go away and grow.

“If you don’t know about what’s available, go out there and do your research, find a way to do it trenchless, learn about every available option, and use it. Money, time, disruption — trenchless just saves municipalities in every respect.” ♦

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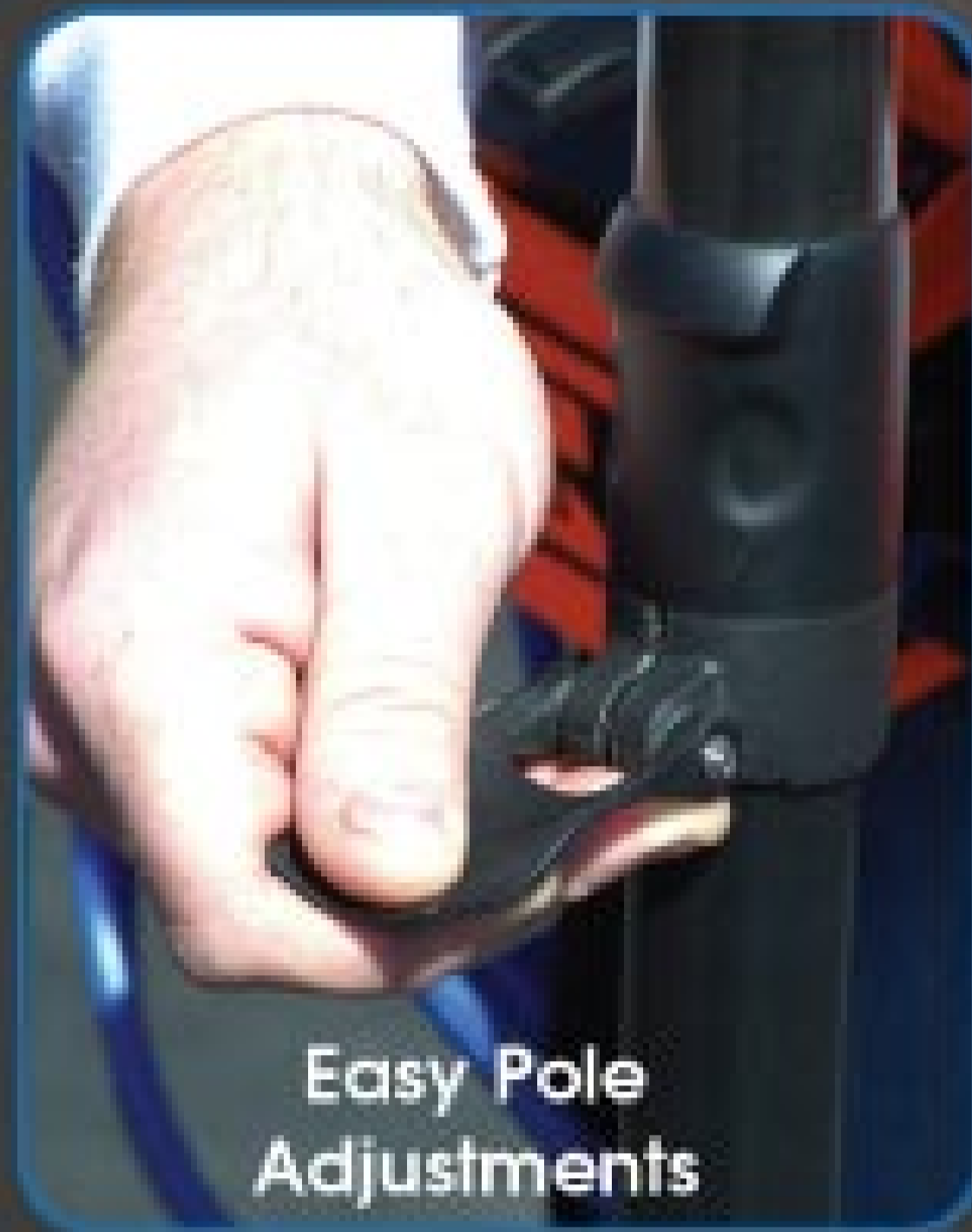
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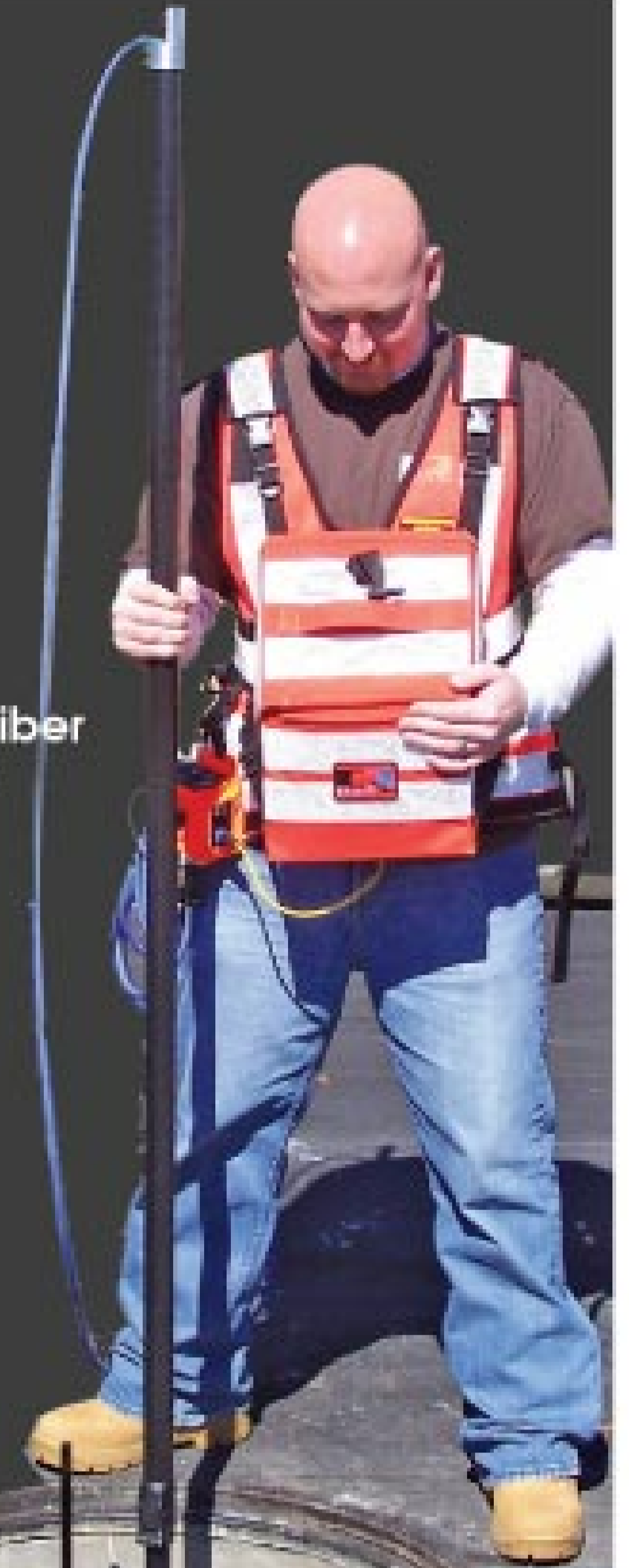


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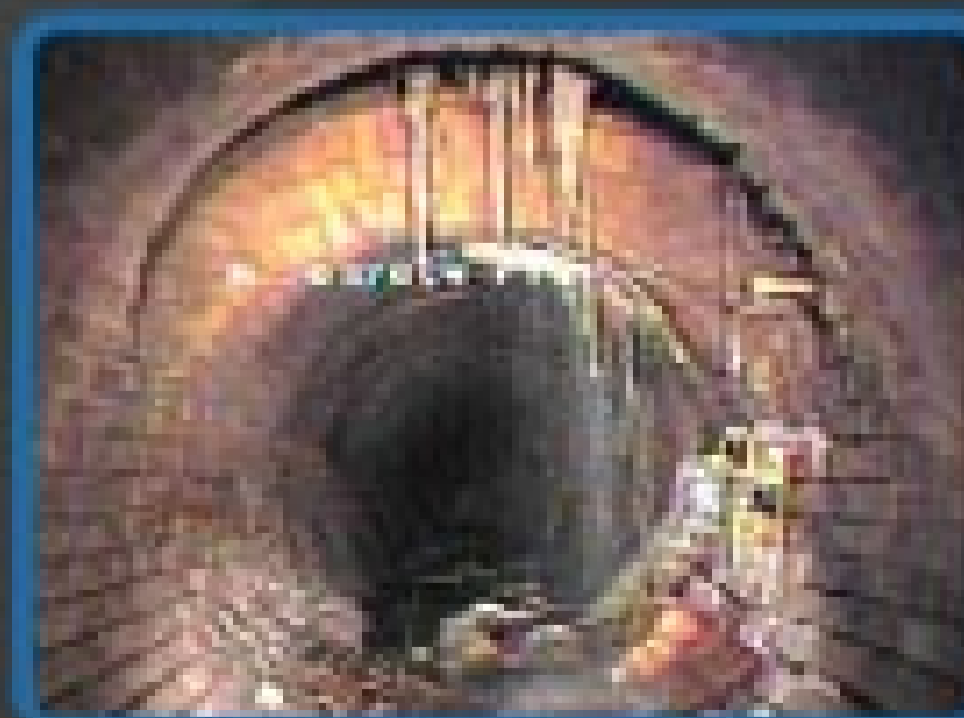
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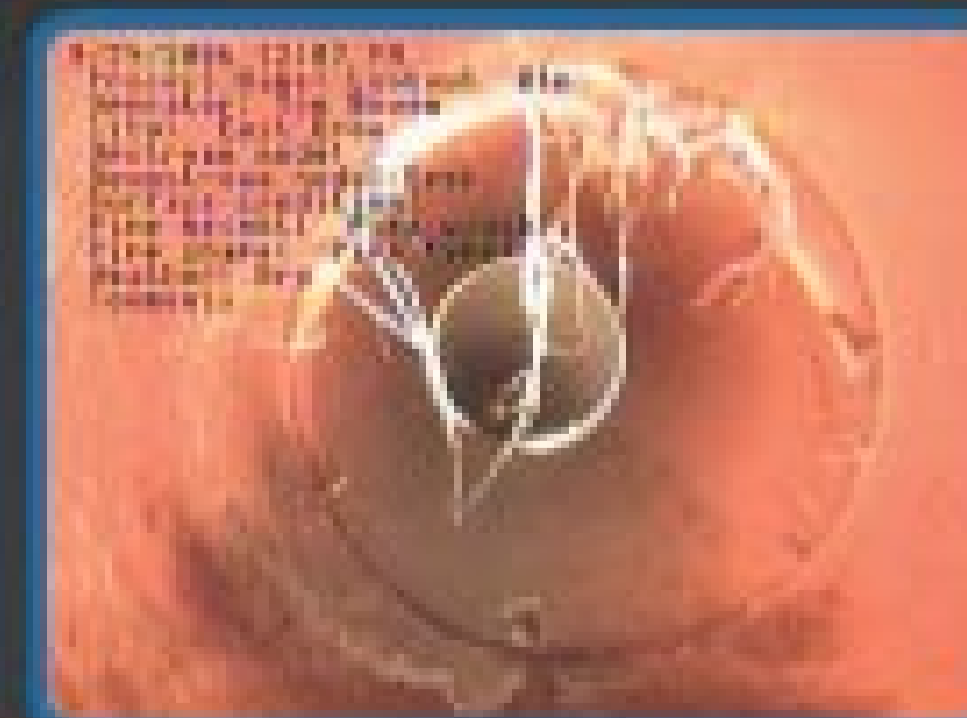
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# IT'S ALL ABOUT THE CRABS

The James City County Stormwater Division engages residents by reminding them that clean water protects one of their favorite delicacies

By *Scottie Dayton*

**I**nstead of telling homeowners to use fewer pounds of fertilizer because it is good for water quality, Fran Geissler and her staff tie the message to something dear to people's palates — crabs.

Crabs, the signature food of the Chesapeake Bay region, drive every stormwater management program for the newly formed Stormwater Division in James City County, Va.

The chief problem is bacterial contamination of crab, clam, and oyster beds. When authorities issue shellfish advisories in tidal waters, the beds remain closed to fishermen until the water is safe again.

Formed in July 2007, the division and its six full-time and one part-time team members accomplish major objectives by working seamlessly with other branches of county government. Their paths cross constantly because of frag-

mented responsibilities. Geissler also has two powerhouses at her disposal: the regional stormwater management effort, known as HR STORM, and statewide communities working together to solve stormwater issues.

Her ace in the hole, though, is the county's well-educated, engaged residents. Anxious to protect their quality of life, they form many vocal, active advocacy groups that rallied around Geissler as she configured each stormwater approach to protecting the shellfish beds.

The result of these combined efforts is an outreach program that provides valuable scientific data, a watershed management strategy geared to restoration and upgrading, and a plan to retrofit the best management practices (BMP) system. The division's accomplishments are testimony to empowered people working toward a common goal — protecting what they like on their dinner plates.

**Robert P. Winters, water quality educator for James City County, explains a fertilization schedule to his wife, Jean Winters. (Photography by C. Ritchie Photography Inc.)**



## Riparian region

James City County is a peninsula bordered on the north by the York River, on the south by the James River, and on the west by the Chickahominy River.



**PROFILE:**  
Stormwater  
Division, James City  
County, Va.

**FOUNDED:**  
2007

**POPULATION SERVED:**  
62,487

**AREA SERVED:**  
144 square miles

**EMPLOYEES:**  
6.5

**ANNUAL RAINFALL:**  
47 inches

**OPERATING BUDGET:**  
\$750,000 (stormwater  
and flood control)

**WEB SITE:**  
[www.jccegov.com/stormwater](http://www.jccegov.com/stormwater)





Photos courtesy of Fran Geissler

**A section of the 2,440-foot Powhatan Plantation Stream channel before restoration shows undercut banks and erosion, and after restoration with riffles and meanders.**



**Stormwater team members head out for stream testing. From front to back are Fran Geissler, stormwater director; Suzanne Dyba, stormwater intern; Spotswood Johnson, stormwater inspector; Wayland Bass, senior civil engineer; and David Greshamer, stormwater inspector.**

The county is only now mapping its 20- to 40-year-old neighborhoods, and it is responsible for drainage easements between lot drainage systems and outfalls. In newer neighborhoods, mandatory homeowner associations operate and maintain the stormwater management facilities.

The county's Environmental Division approves stormwater projects. The Stormwater Division, meanwhile, focuses on retrofit and stream restorations and other non-construction related MS4 requirements. The division also ensures that owners maintain their systems.

HR STORM, the stormwater education program of the Hampton

Roads Planning District Commission, helps the county by providing quality materials and premium items so the county staff does not have to create them. "HR STORM is like a store," says Geissler. "For example, we placed an order for storm drain medallions and, because we got a really good price, we gave them to advocacy groups for installation." A crab silhouette fills the center of medallions that say: "No Dumping. Drains to Waterway."

All stormwater posters, pamphlets, manuals, and other handouts used in the division's booth at fairs and community events come

from HR STORM. The program's Web site provides information on how to dispose of medicines and household chemicals, maintain swimming pools, and landscape for waterways.

It also advises homeowners on ways to prevent motor oil, anti-freeze, fertilizers, pesticides, detergents, household hazardous wastes, pet waste, yard debris, and litter from polluting runoff. The site also has tools for educators and activities for kids and families.

The county also benefits from the regional Chesapeake Club program. That social marketing effort

encourages lower fertilizer use to protect crab populations. The program's drink coasters, found in many county restaurants, remind patrons to save the crabs. "Every restaurant has crab cakes on the menu," says Geissler.

### **Bacterial bloodhounds**

The division's chief problem is that no one knows the sources of the bacteria that contaminate the shellfish beds. One indicator suggests wildlife. The abundance of open water and the 600 detention ponds look appealing to untold numbers of geese, deer, raccoons,

## NEW AND OLD

Maintaining and repairing long-neglected neighborhood drainage systems takes a good part of the budget for the James City County Stormwater Division. Developments before 1990 are owned by neighborhood associations often unable to fund repairs.

"If they levee a fee, everyone drops out of the association," says Fran Geissler, director of the division. "My staff spends a lot of time investigating drainage complaints and problems."

Acidic runoff corrodes and collapses corrugated metal stormwater pipes within 20 years. The staff pops manhole covers to inspect drainage systems in

10 neighborhoods annually, and does repairs including inspection, cleaning, replacement, and upgrades. "We spend \$75,000 on drainage repair, open-cutting and replacing 300 to 400 feet per year with HDPE or concrete reinforced pipe," says Geissler.

Most stormwater infrastructure after 1990 is owned and maintained by mandatory homeowner associations. Geissler's staff provides technical assistance, inspects best management practices every three years, makes recommendations, and gives associations an inspection report to guide their maintenance work.

shore birds, and waterfowl. An EPA report states one watershed will probably never meet water-quality standards because wildlife there is abundant and difficult to manage — nothing people can do will matter.

Failing septic systems are another suspect, so the county plans to inventory them. Another source could be pet waste, which may contribute up to 20 percent of the contamination.

To identify and track bacterial points of origin, one plan is to use

trained 40 people and certified more than 25 water monitors.

“Water sampling is one thing we do that makes us special, and our volunteers make it possible,” says Geissler. “We couldn’t possibly afford to hire consultants to collect as much data as we’re getting from our volunteers.”

Teams of two sample 20 sites around the county three or four times a year. Some are in pristine areas, others are below restoration projects, and still others are in urban

From left, Spotswood Johnson, Suzanne Dyba, David Greshamer and Fran Geissler analyze stream samples.



microbial source tracking. But because the county has tidal and salt waters, it needs different indicators. When funds become available, Geissler’s division will pay the HR STORM commission an additional fee to look for a microbial source tracking method that is more foolproof and responsive than the state’s library-style system.

Soils are another major contributor to pollution. The lower part of the county has poorly drained, very silty/clayey/organic Class D soils with high groundwater tables and very low infiltration. Runoff races through these areas, carrying silt and debris.

### Bug hunters

To evaluate the health of area streams and rivers, Geissler’s staff adopted a cost-efficient yet effective outreach volunteer monitoring program using protocols and quality assurance from the Virginia Save Our Streams (SOS) program. From June 2008, through mid-2009, SOS

venues. Using kick seines, volunteers agitate a sample area to dislodge and collect benthic macroinvertebrates. The organisms are identified, counted, and released.

“We’re looking for trends,” says Geissler. “Because organisms living

**“Water sampling is one thing we do that makes us special, and our volunteers make it possible. We couldn’t possibly afford to hire consultants to collect as much data as we’re getting from our volunteers.”**

Fran Geissler

on stream bottoms vary in their ability to tolerate pollution, they are good indicators of overall watershed health. The creatures we find determine if our streams are acceptable, partially acceptable, or unacceptable.” The Department of Environmental Quality reports that the volunteers are submitting professional data.

### Buffer areas

Since the program is young,



Senior civil engineer Wayland Bass looks over evidence of urban stream syndrome and a sign of an active bedload of sediment moving downstream (the plastic slide in the streambed).

Geissler cannot state the health of the streams and rivers with certainty, but they appear to be holding their own. One factor could be the 100-foot riparian buffers required along tidal localities. “The little data we have indicates that they do

also does *E. coli* scans and easy gel screening for bacteria in watersheds with total maximum daily loading (TMDL) limits.

As word of the stream monitoring program spread, citizens of nearby counties and cities began asking Geissler if their stormwater agency also had one. “We’re blazing the path here,” she says. “I don’t know of any other county doing this, but I direct interested parties to the person who can start such a program.”

### Turf Love

The stormwater program also extends to yard-care initiatives. Residents from northern states who move to Virginia are used to fertilizing their warm-season grasses in spring. However, the state’s cool-season grasses are fertilized in fall. Opposing fertilizing regimes led the county to blaze another trail: Its 10-year-old Turf Love program educates homeowners to apply the right amount of fertilizer at the right time.



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Jaguar Buie-Smith (left) and Katie Szkyman are shown near the MidCounty Park Dog Poo Station.

Turf Love also involves soil sampling. For \$35, a volunteer collects soil from a lawn and Virginia Tech University tests it. Based on

the analysis, the county develops a seeding and fertilizing schedule and provides lawn-care recommendations to the homeowner for the

next three years.

"Our soil has ample natural phosphorus, so we tell residents to read the labels on bags of fertilizer and don't pay more for unnecessary elements," says Geissler. "Their lawns will be happy, and so will the crabs."

In 2008, the division achieved another first, completing a stream restoration as part of the county's first management plan for the Powhatan Creek watershed. Population growth and farmland tilled for 400 years had produced many stream channels entrenched and disconnected from their floodplains. Geissler's staff studied living resource issues and opportunities for BMP retrofits or stream restorations, then selected the Powhatan Plantation tributary for the project.

Low-infiltration soils upstream send water gushing through the 22-square-mile Powhatan Creek watershed, which empties into the James River. The area also has very erodible soils. Once a head cut starts, the water keeps cutting and even gullies backward.

"It's amazing how much sediment moves downstream," says

Geissler. "Sediment in tidal systems remains there, washing back and forth and affecting every part of the ecosystem and user chain. It's hard on the crabs and other shellfish, too."

To restore 2,440 feet of stream channel, workers excavated and reshaped it by adding riffles and meanders, then connected it to its floodplain. The stream can now safely overflow its banks. Studies of similar reconstructions show a dramatic reduction in nitrogen and sediment discharge. Powhatan Plantation Stream is the county's signature water management project.

Whether it's a dog-friendly Frisbee reminding owners to scoop the poop, rain gardens, fertilizer management, or volunteer stream monitoring, Geissler continues to seek approaches that will reach residents with a stormwater message.

"We have to take care of what is in our power," she says. "We all should try, because we want crab cakes for dinner and to chase them down with raw oysters." ♦



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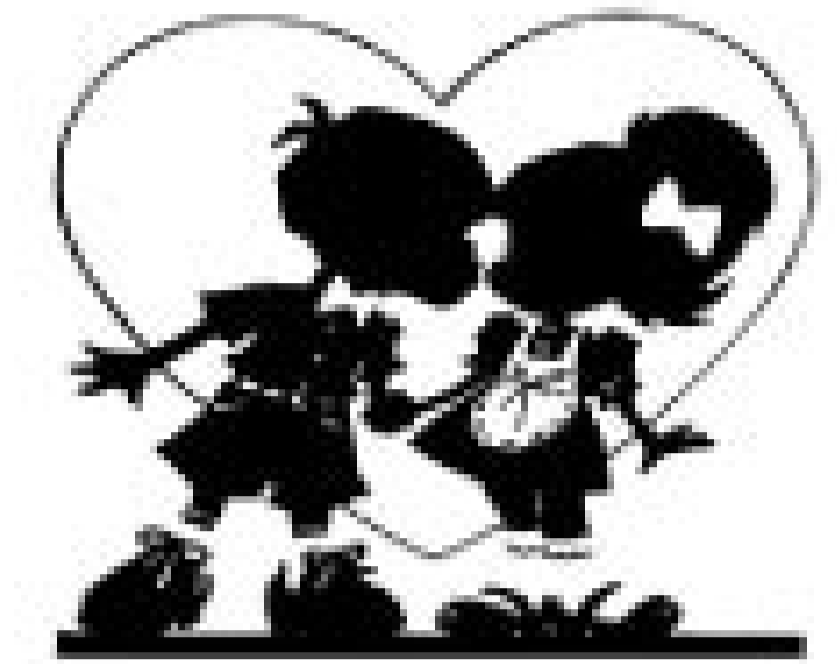
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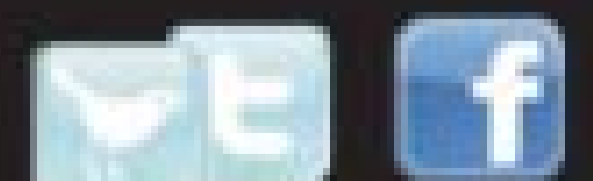
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- 11:00 - 12:00 Jetting Nozzles - Their Design, Technology and Effective Usage
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Elevating the Quality of Your CCTV Inspection Program
- 2:30 - 3:30 Critical Steps in Prioritizing Sewer Rehabilitation
- 4:00 - 5:00 Traffic Control - The Critical Factor in Pipeline Inspection

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- 11:00 - 12:00 Selling CIOWTS Certification to Installers and Regulators
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Softeners and Onsite Systems
- 2:30 - 3:30 Advanced Wastewater Treatment Systems
- 4:00 - 5:00 Maximize Efficiency by Working Closely with Regulators and Within the Regulatory System

## NATIONAL ASSOCIATION OF WASTEWATER TRANSPORTERS

### ROOM B101-B102 - NAWT

- 8:00 - 9:00 Sampling Protocols and Methods for Alternative Technologies
- 9:30 - 10:30 Dealing with Restaurant or High-Strength Waste
- 11:00 - 12:00 O & M for ATUs
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 O & M for Drip Irrigation
- 2:30 - 3:30 What to Expect When the EPA Comes A-Callin'
- 4:00 - 5:00 A Template for Keeping Your Employees Trained

## NATIONAL ASSOCIATION OF SEWER SERVICE COMPANIES

### ROOM C101-C104 - NASSCO

- 8:00 - 9:00 Pipe Inspections without an Operator?
- 9:30 - 10:30 Ways to Increase Your Daily Sewer Cleaning Production Rates without Increasing Your Costs
- 11:00 - 12:00 Proper Preparation of the Substrate Results in Coating Longevity
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Collection System Asset Management - Getting from Reactive to Proactive
- 2:30 - 3:30 Trenchless Lateral Renewal Technologies - Lessons to be Learned
- 4:00 - 5:00 Zoom Camera Technologies: The Next Level of Infrastructure Inspection

## WATERJET TECHNOLOGY ASSOCIATION

### ROOM C203 - WJTA

- 8:00 - 9:00 The Impact of OSHA's Combustible Dust National Emphasis Program on Industrial Vacuuming
- 9:30 - 10:30 Waterblast Safety
- 11:00 - 12:00 Waterjet Applications and Business and Financial Considerations

## PORTABLE SANITATION ASSOCIATION INTERNATIONAL

### ROOM C203 - PSAI

- 1:00 - 2:00 Understanding Your True Cost Analysis to Ensure Profitability - Part 1
- 2:30 - 3:30 Understanding Your True Cost Analysis to Ensure Profitability - Part 2

## LEADERS RESOURCE NETWORK

### ROOM C201-C202 - LRN

- 8:00 - 9:00 Creating Your Vision for Success
- 9:30 - 10:30 Getting Your Team On Board
- 11:00 - 12:00 Working Effectively in a Family Business Culture
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Creating Your Own Competitive Edge
- 2:30 - 3:30 Winning More Sales
- 4:00 - 5:00 Women in Business: Panel Discussion

## NATIONAL ONSITE WASTEWATER RECYCLING ASSOCIATION

### ROOM B103-B104 - NOWRA

- 8:00 - 9:00 Wastewater Characteristics
- 9:30 - 10:30 Soils and Site Evaluation Overview
- 11:00 - 12:00 Septic Tank Overview: Function, Design, Construction, Inspection and Troubleshooting
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Seminar on Aerobic Treatment Units
- 2:30 - 3:30 Seminar on Media Filters
- 4:00 - 5:00 Seminar on Pumps and Controls

## SCOTT HUNTER

### ROOM C109-C112

- 9:30 - 10:30 Relationship is the Key!
- 11:00 - 12:00 The Art of Customer Service
- 12:00 - 1:00 **LUNCH BREAK/BOOK SALES**
- 2:30 - 3:30 Creating an Outrageously Successful Company - Part 1
- 4:00 - 5:00 Creating an Outrageously Successful Company - Part 2

## THURSDAY

February 25th, 2010

### BUSINESS TRACK ROOM C101-C104

- 8:00 - 9:00 New 4 P's of Marketing  
*Jerard Nighorn/Lenzyme Trap-Clear Inc.*
- 9:30 - 10:30 Quit Learning and Start Doing  
*Bill Raymond/Nexstar Network*
- 11:00 - 12:00 5 Secrets of Winners  
*Kenny Chapman/Nexstar Network*

### INSTALLER TRACK ROOM B102

- 8:00 - 9:00 Risk Assessment for Determining SVC Frequency  
*Colin Bishop/Bord na Mona*
- 9:30 - 10:30 From Theory to Reality  
*Roger Lacasse/Premier Tech*
- 11:00 - 12:00 Timed Dosing and Controls  
*Mark Gross/Orenco*

### LIQUID WASTE TRACK ROOM B103

- 8:00 - 9:00 Understanding the Biology and Function of an ATU  
*Doug Dent/Ecological Laboratories*
- 9:30 - 10:30 Permit Required Confined Space  
*Ed Fitzgerald/Jack Doherty Co.*
- 11:00 - 12:00 Keep Profit Margins High  
*Joel Smith/Clear Computing Inc*

### PORTABLE TOILET TRACK ROOM B104

- 8:00 - 9:00 Up-Selling: How to Thrive During a Recession  
*Ray Luden Jr./PolyJohn*
- 9:30 - 10:30 Portable Sanitation Business Overview  
*Deric Boggs, Phil LaRoche/Satellite*
- 11:00 - 12:00 Routing Efficiency and Analysis  
*Greg Muth /UPS Logistics Technologies*

### MUNICIPAL TRACK ROOM C105-C108

- 8:00 - 9:00 Pipe Cleaning Tools  
*Dana Hicks/ENZ USA Inc.*
- 9:30 - 10:30 Increase Revenues through Pipeline Laser & Sonar  
*Doc Bennet/CUES*
- 11:00 - 12:00 How to Prevent I/I in the Manhole Chimney Area  
*William Goff/Sealing Systems Inc.*

### SPANISH TRACK ROOM C109-C112

- 8:00 - 9:00 Limpieza de Drenajes y Tuberías y la Elección de Boquillas  
*Jim Aanderud/SSCSC*
- 9:30 - 10:30 Formando un Programa Eficaz de Inspecciones CCTV  
*Jim Aanderud/SSCSC*

### WOMEN IN THE INDUSTRY ROOM C203

- 9:00 - 12:00 The Regeneration Process: How to Re-energize, Re-purpose, Re-invent and Handle Everything!  
*Ann Fry*

## FRIDAY

February 26th, 2010

### MUNICIPAL TRACK ROOM C105-C108

- 8:00 - 9:00 Identifying Manhole I/I Sources and Cost-Effective Repair Methods  
*Lee Haessig/Cretex Specialty Products*
- 9:30 - 10:30 Jet Up! Taking Science to the Sewer  
*Scott Paquet/NozzTeq Inc.*
- 11:00 - 12:00 Cured in Place Pipe vs. Digging and Replacing  
*Travis Bohm/Perma-Liner*

### BUSINESS TRACK ROOM C101-C104

- 8:00 - 9:00 Quality and the True Cost of Ownership  
*Matt Sutton/Rapid View*
- 9:30 - 10:30 Vision and Direction: Leading your Service Company to Prosperity  
*Victoria Finley/One Biotechnology*
- 11:00 - 12:00 How to Shop Your Insurance Effectively  
*Mark Herring/Hefferman Insurance*

### INSTALLER TRACK ROOM C109-C112

- 8:00 - 9:00 Safety in Excavation  
*Gary Hooks/Safety Corporation of America*
- 9:30 - 10:30 Comprehensive Control Panel Training  
*Joe Zimmerman, Scott Rietsema/SJE Rhombus*
- 11:00 - 12:00 Onsite Wastewater Effluent Disinfection  
*Jim Cruver/Salcor*

### LIQUID WASTE TRACK ROOM B103

- 8:00 - 9:00 Dewatering Alternatives  
*Kelly Brown/BDP Industries*
- 9:30 - 10:30 Convert a Liability to an Asset  
*Emily Landsburg/Black Gold Biofuels*
- 11:00 - 12:00 The Role of Bacteria and Bioaugmentation in Grease Traps and Septic Systems  
*Dr. Clarence Baugh/Custom Biologicals*

### SEWER & DRAIN TRACK ROOM B102

- 8:00 - 9:00 Drain Cable Technology and Their Real World Applications  
*Keith Nesky/Spartan Tool*
- 9:30 - 10:30 OSHA Procedures Regarding Confined Space  
*Chris Cira/M Tech*
- 11:00 - 12:00 Sonde and Utility Line Locating Techniques  
*Rob Trefz/RIDGID*



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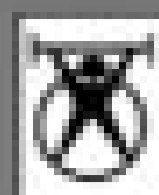
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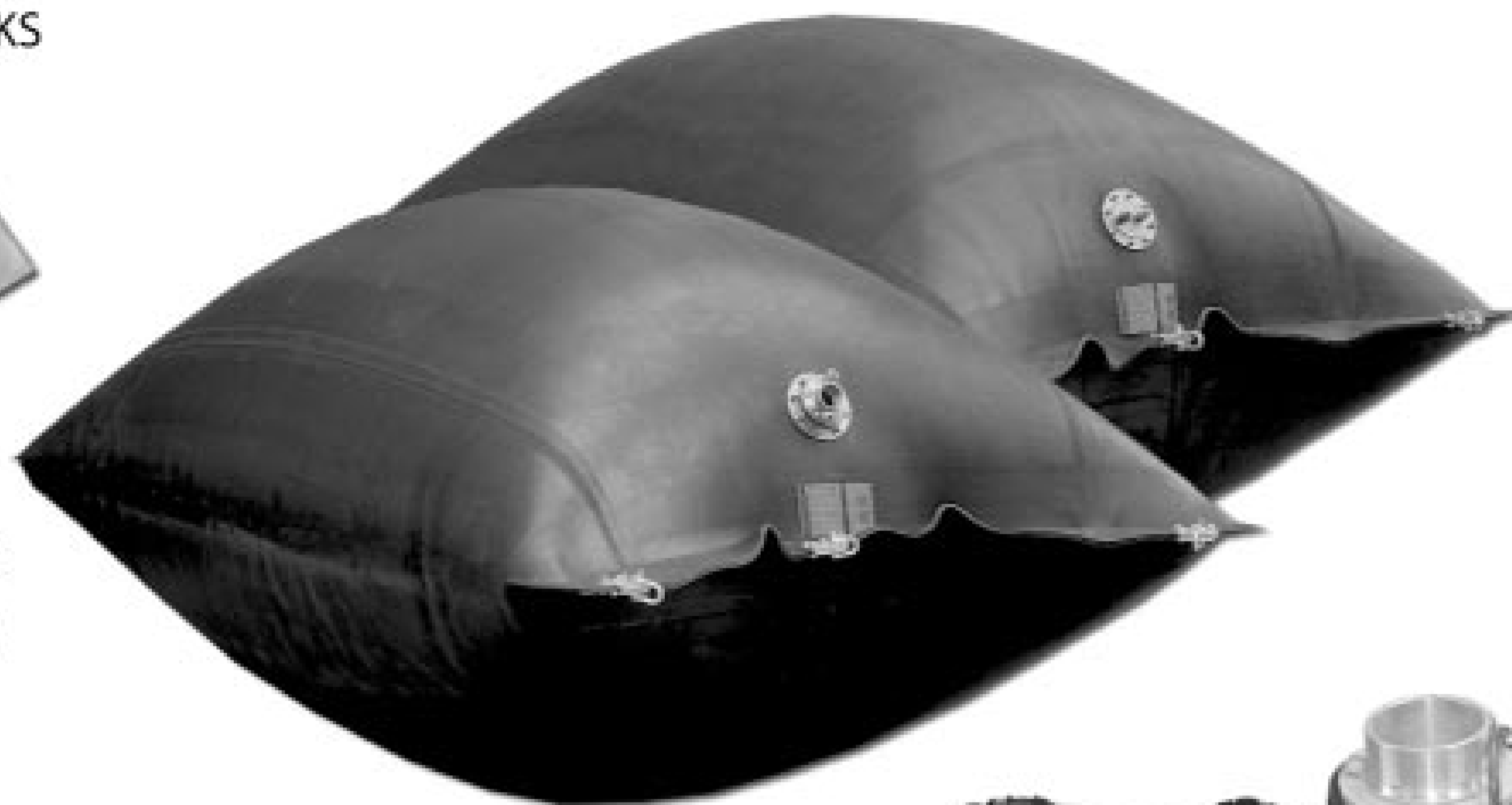
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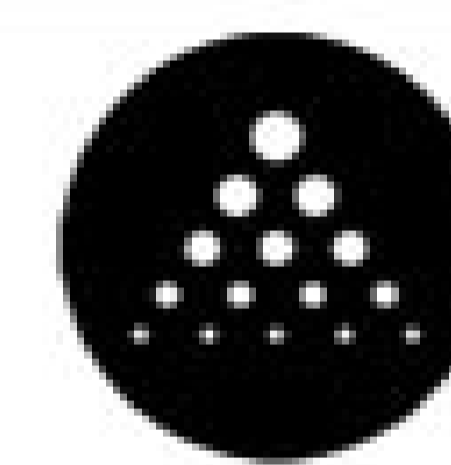
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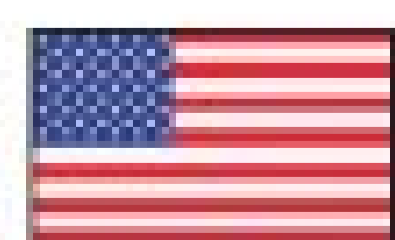
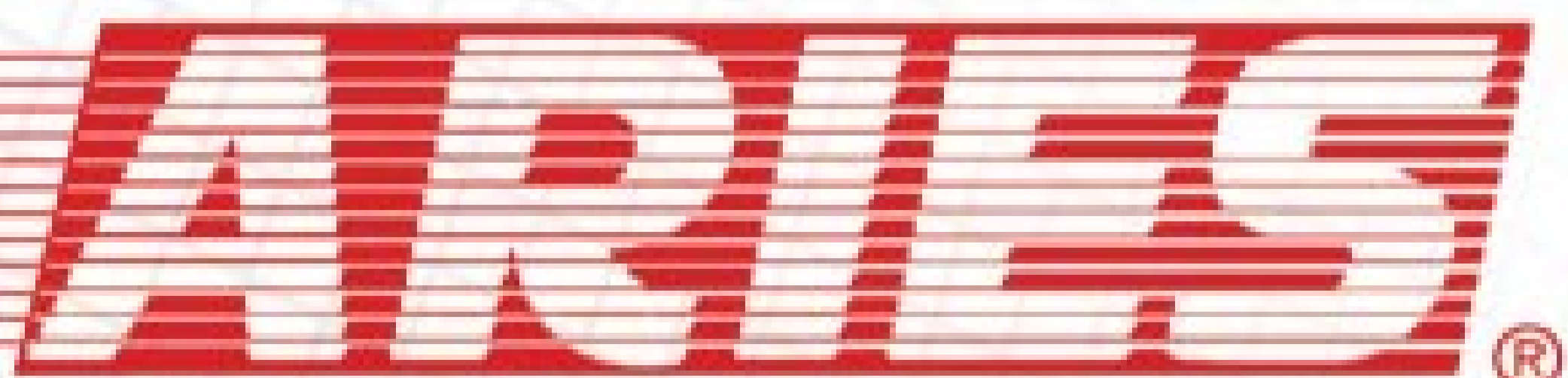
The Pathfinder is designed and manufactured in the U.S.A. by Aries Industries, Inc. The high resolution camera module and high intensity LED lighting let you see details that other cameras miss. The brushless drive motors and electronic clutches in the tractor yield longer life, less maintenance and maximum power in a minimum size for optimal productivity. The standard back-up camera with LED lighting helps negotiate bends in the pipe while retrieving system. The Pathfinder is designed and built with the Aries performance and durability that you deserve and have come to expect.

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In the Bandalong Litter Trap, debris is corralled by flotation booms, while a gate prevents the litter from escaping. (Photos courtesy of Storm Water Systems Inc., Cleveland, Ga.)

# LITTER CORRAL

A trapping device tested in the nation's capital skims debris from stream surfaces, helping to keep waterways clean

By *Scottie Dayton*

A combined storm and sanitary sewer system in the District of Columbia serves 12,955 acres, or 33 percent of the city. Stormwater runoff conveys a significant portion of trash from streets, road right-of-ways, and sidewalks to outfalls discharging to the Anacostia River.

The Metropolitan Washington Council of Governments estimates that more than 20,000 tons of trash enters the river every year. Depending on the tide, heavy flows during rainstorms propel the litter downstream into tidal wetlands or

upstream into the national Kenilworth Park, Aquatic Gardens, and Marsh. The trash is an eyesore and environmental nuisance.

To manage the litter, the D.C. Water and Sewer Authority runs skimmer boats on the river, cleans catch basins, and does limited street sweeping. Nevertheless, John Wasiutynski, environment protection specialist with the District Department of the Environment (DDOE), knew the efforts were insufficient to comply with state clean water regulations that would go into effect in January 2010.

Then Robert Boone of the Anacostia River Watershed Society met Gary Hopkins, president of Storm Water Systems Inc. in Cleveland, Ga., at a trade show. Hopkins showed him the Bandalong Litter Trap, a floating device that uses the current to guide and capture litter.

"We were excited when Bob told us about the product," says Wasiutynski. "We designed a two-year test project for it, then received a grant to purchase it." Installed in April 2009, the trap had collected 5,000 pounds of wet trash by the end of October. It

### BETTER MOUSETRAPS

**PRODUCT:**

Bandalong Litter Trap

**APPLICATION:**

Captures floating litter from streams

**BENEFITS:**

Cost effective, maintains cleaner waterways

**USER:**

District of Columbia  
Department of the Environment

**MANUFACTURER:**

Storm Water Systems Inc.,  
Cleveland, Ga.

**WEB SITE:**

[www.stormwatersystems.com](http://www.stormwatersystems.com)

operates year-round, and all the litter goes to a landfill.

### No escape

Hopkins customized the 5- by 22-foot-long trap to fit in the lower tidal reach of Watts Branch in the deepest and widest part (40 feet) of the channel. Watts Branch, a tributary to the Anacostia River, is a 3.53-square-mile subwatershed. At this point, the water flows under a

bridge before entering the river. The trap, which does not affect fish and wildlife, needs 8 to 10 inches of water to float.

To install the unit, Hopkins' team bolted a rider pole to each wing wall of the bridge, then attached the first set of flotation booms to the poles. The setup enables the booms to rise and fall with the tides and changes in flow created by rainstorms. A trailer-

mounted hydraulic lift lowered the 600-pound partially preassembled aluminum and high-density polyethylene trap over the bridge and into the water.

The trap has two flotation booms held together by a metal frame. After the men connected the two sets of booms, they anchored the trap to the stream bank with guy wires cemented into the ground. The wires prevent back-

aren't the issue," says Wasiutynski. "High flows are, and we had a very wet summer, often necessitating emptying the trap more than once a week."

Volunteers waited for low tide, then used nets to scoop out the litter. However, the trap can be retrofitted with 200-pound removable baskets that a small truck-mounted boom crane can lift and empty. Since the area has mild winters, the



A worker guides the 600-pound partially preassembled aluminum and HDPE trap as the hydraulic lift lowers it over the side of the bridge. Note the first set of flotation booms attached to the rider poles on the wing walls of the bridge.



The litter trap fits in the lower tidal reach of Watts Branch in the deepest and widest part (40 feet) of the channel.

**“Tides aren’t the issue. High flows are, and we had a very wet summer, often necessitating emptying the trap more than once a week.”**

**John Wasiutynski**

and-forth motion. The installation took two days.

When the tide recedes, a counterbalance (acts like a pump float) opens the gate on the trap, allowing trash to drift in. When the tide returns, the counterbalance closes the gate, trapping the litter.

Flows of 8 to 10 cubic feet per second are most effective, but traps can be designed to withstand higher rates. “I’ve seen flows go from 20 cubic feet per second to 4,000,” says Hopkins. “Unless fitted with an optional screen, debris blasts out of the trap during such events.”

### Encouraging results

The trap requires cleaning after every rainstorm. For the first two years, Earth Conservation Corps volunteers will do it. Then the DDOE assumes the task. “Tides

trap remains in place throughout the year. Except for removing the litter, the unit is maintenance free.

“We have a net trap at another outfall and the Anacostia River Watershed Society built its own litter trap to test simultaneously with the Bandalong,” says Wasiutynski. “Neither did as well as the Bandalong in last summer’s heavy rains and high flow rates. Provided the application is appropriate, I would recommend the product.” ♦

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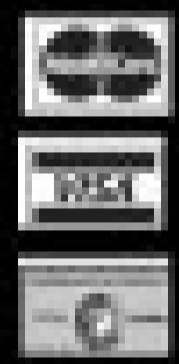
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# MAX-LIFE Manhole Tools

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Debris Catcher shown used with Fiberglass poles.



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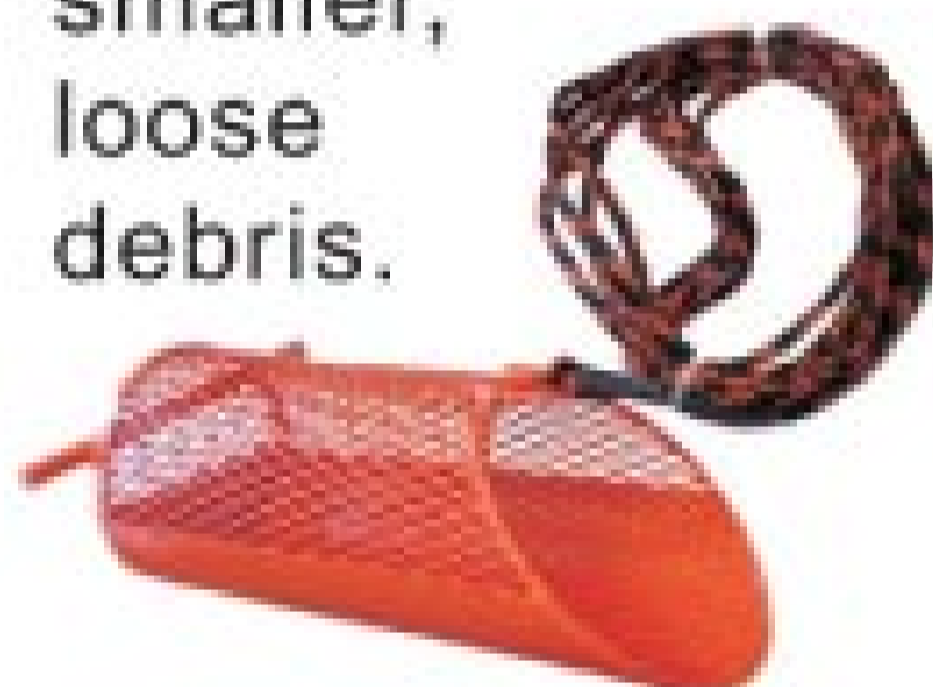
### Debris Catchers

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### Grit Catchers

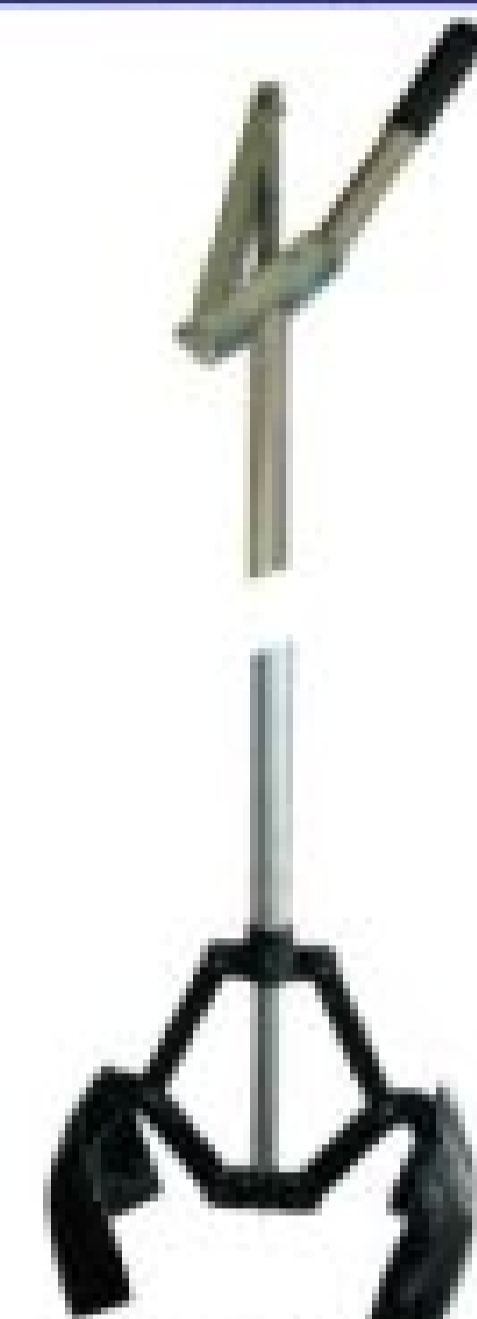
Stops finer grit, black sand and smaller, loose debris.



Debris Catcher for use with Poles

Debris and Grit Catchers both can be used with Fiberglass Poles. Provides for positive action of positioning, raising and/or lowering these catchers in manholes.

Grit Catcher for use with Poles



### Versi-Clam

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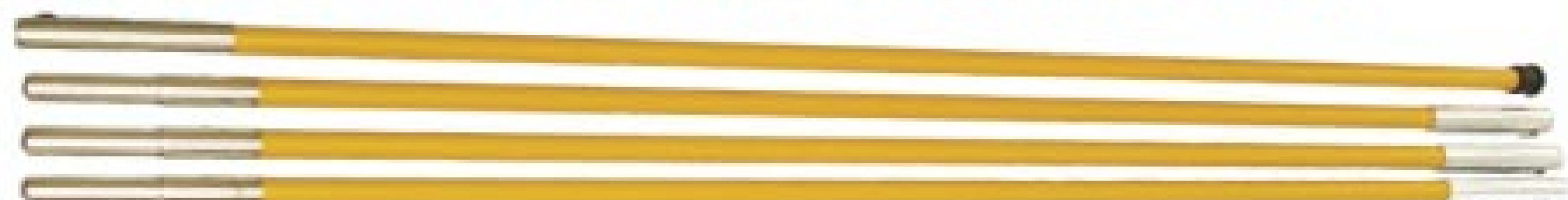
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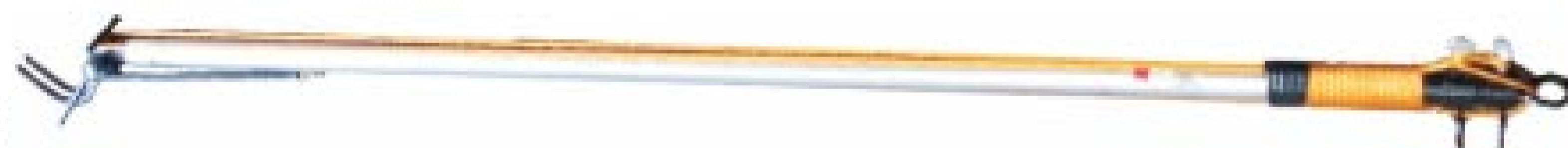


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# HOW BIG IS THAT PIPE?

By Ted J. Rulseh



Trent Tobiason with the pipe-diameter measuring tool he devised while working for the City of Columbus, Neb.

Many wastewater collection system technicians have had this experience: You need to inspect a line, or set up a skid for waterjet cleaning, but from your vantage point in the street you can't confidently tell if the pipe is 6-inch or 8-inch. And you'd rather not perform a confined-space entry to go down the manhole and use a tape measure.

Trent Tobiason, a sewer maintenance worker for the City of Columbus, Neb., faced such issues often — and developed a solution. “It’s a simple device that can be built with about \$10 to \$15 in parts from a hardware store,” he says.

The tool (see accompanying pictures) is made of plastic pipe. The long vertical piece and the short coming off at 90 degrees are 3/4-inch Schedule 40 PVC. The two short pieces coming out the ends of the tee connector are Schedule 30 PVC pipe. The piece slid through the Schedule 30 PVC is 3/4-inch CPVC.

Tobiason cut slits in the Schedule 30 sections so the hose clamps can squeeze and hold the CPVC piece. Then he cut pieces of CPVC about one-half inch shorter than the standard inside diameters of various-size sewer pipes: for example, 5.5 inches for measuring 6-inch pipe, 7.5 inches for measuring 8-inch pipe.

Now, suppose he believes — but isn't certain — that a pipe at the bottom of a manhole is 8 inches. He inserts the 7.5-inch CPVC section to the tool, clamps it in place, and inserts the tool down

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the manhole. He then tries to move the 7.5-inch measuring piece into the pipe. If it won't fit, he knows that pipe is smaller than 8 inches, and he can measure again with a different piece of CPVC.



The tool helps sewer workers differentiate between pipe sizes without having to enter a manhole. It can be built with \$10 to \$15 worth of materials.

If it does fit in the pipe, he checks side-to-side and up-and-down movement, keeping tool square with sewer main. If tool has sloppy fit, he knows the pipe is larger and tries the next longest CPVC section.

“Be sure not to measure the bell of a main,” he says. “To have additional verification of the pipe size, you can insert the tool and use a pole-mounted camera to get a visual. This method sure beats climbing down inside a manhole.” ♦

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# FROM THE INSIDE

The LETS inspection system from Aries Industries lets municipal and contractor crews expedite evaluation of private sewer laterals by looking in from the mainline

By Ted J. Rulseh

Private sewer laterals are a major source of infiltration in many communities. Inspecting those pipes can be a chore, because in many cases cleanouts and other access points are hard to find, or don't exist outside the homes or businesses.

The Lateral Evaluation Television System (LETS) from Aries Industries Inc. provides one way to solve that problem. It enables inspection crews to locate lateral openings inside the public sewer main, then look up the laterals for

up to 150 feet. The process is usually much quicker and more cost-effective than trying to inspect laterals from the privately owned side.

The LETS enables inspection of all laterals on a pipe segment from manhole to manhole with just one mainline setup. The device combines a spotter camera mounted on a powered crawler with a push camera, also carried on the crawler, that does the actual lateral inspection.

National Power Rodding (NPR), a company of Carylton Corporation



A movable chute at the front end of the inspection crawler enables the camera head to tilt up and down and rotate to the side. The camera head also extends outward to travel up the lateral.



The LETS carries a lateral camera (foreground) and a spotter camera behind it, both with LED illumination. (Photos by Ted J. Rulseh)

based in Chicago, Ill., operates some 10 inspection vans outfitted with the LETS technology. NPR provided one of its vans for a demonstration outside its Chicago headquarters.

Leading the demonstration, held on July 23, was Richard Schantz, P.E., product manager with Aries Industries. At the controls of the camera system was TV operator Rafael Concepción. NPR president Harold Kosova observed.

## Walk-around

The LETS is a truck-based system. National Power Rodding uses box trucks equipped to enable either LETS inspections or conventional mainline inspections. At

## TECHNOLOGY TEST DRIVE

### EQUIPMENT:

Lateral Evaluation Television System (LETS)

### MANUFACTURER:

Aries Industries Inc.  
800/234-7205  
www.ariesindustries.com

### LOCATION OF DEMO:

Chicago, Ill.

### DEMONSTRATED BY:

Richard Schantz, P.E., product manager, Aries Industries;  
Rafael Concepción, TV operator, National Power Rodding

### LIST PRICE:

Approx. \$35,000  
(not including vehicle)





A picture-in-picture feature allows the operator to see the views from the spotter camera and lateral camera at the same time. In this image, the full-screen picture is the spotter camera's view and the inset is the lateral camera's view. Note the lateral opening at the right center of the screen. At the flip of a switch, the operator can reverse the priority so that the full-screen image is the lateral camera's view.

the rear of the truck are powered reels containing pushrod for the lateral camera, multi-conductor cable for LETS inspections, and single-conductor cable for mainline surveys.

The truck used for the demonstration carried 80 feet of push

**The LETS enables inspection of all laterals on a pipe segment from manhole to manhole with just one mainline setup. The device combines a spotter camera mounted on a powered crawler with a push camera, also carried on the crawler, that does the actual lateral inspection.**

cable, backed by lighter-duty cable to enable traverse up the main.

At the front of the truck is a rear-facing operator station that includes all necessary camera and crawler controls, along with a monitor for viewing inspection detail and a laptop computer for entering observations. The LETS controller uses simple toggle switches to control the movements of the lateral camera.

One switch is used to tilt the lateral camera chute up/down and rotate it left/right. Another controls the extension of the lateral camera pushrod (extend or retract). Another regulates the speed of

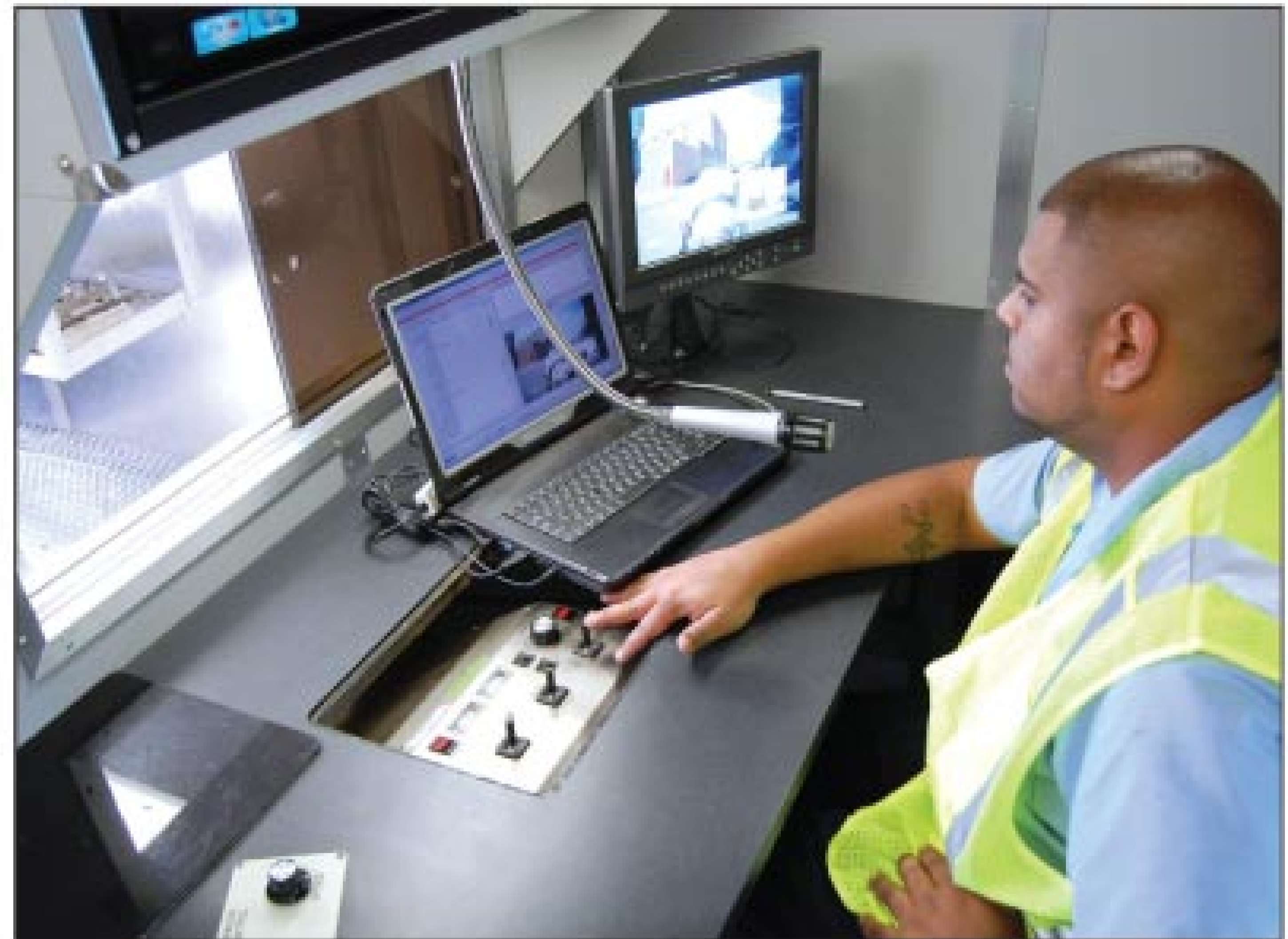
chute rotation and of insertion and retraction.

The LETS crawler itself is a tracked vehicle. It carries the self-leveling lateral camera and, mounted behind that, a spotter camera that helps the operator see laterals entering the mainline and direct

the lateral camera into them. For this demonstration, the crawler was configured for a 12-inch main.

The pushrod for the lateral camera runs along the underside of the crawler through a set of powered rollers that the operator activates to send the camera out from the mainline and into the lateral. One roller senses the pushrod footage. The lateral camera head rests in a chute at the front of the crawler. The operator can use the controls to tilt this chute upward or rotate it right or left to enable access to the laterals.

The front end of the pushrod has a flexible neck to accommo-



The control room inside the truck includes a monitor displaying only the camera images, and a laptop computer that displays the images along with survey software for entering observations. In the foreground is the control with toggle switches, used to select the camera view and control the lateral camera.

date launching into elbows on laterals. The camera head includes a beacon (sonde) that emits a 512-Hz signal so that the camera can be located from above ground.

Once the camera is deployed, the operator observes progress on the computer monitor, which displays a full-screen image. The operator can choose four views:

- Spotter camera image only.
- Lateral camera image only.
- Picture-in-picture with the lateral camera image in full screen and the spotter camera image inset.
- Picture-in-picture with the spotter camera image in full screen and the lateral camera image inset.

**Operation**

The demonstration took place on a side street outside NPR's main garage, which is at 2500 W. Arthington St., Chicago. Concepción connected the multi-conductor cable and pushrod to the camera crawler

and placed it next to a covered manhole. He then took his seat at the console and, with the camera on the street surface, demonstrated how the controls are used to tilt



The system is deployed in the same manner as a traditional crawler camera. The crawler is connected to multi-conductor cable (red) and pushrod (black).

and rotate the lateral camera head and extend the pushrod.

Next he opened the manhole, deployed the camera, returned to the control console, and began to drive the crawler upstream into the 12-inch mainline. The NPR facility is an older area, of Chicago, where many homes and businesses have come and gone over time. That would explain the close spacing of laterals joining mainline, most of them abandoned and no longer flowing.

Watching the color image on his monitor, Concepción looked for lateral openings with reddish deposits around them, indicating



**Richard Schantz of Aries Industries points to the powered rollers on the crawler that drive the push cable for the lateral camera.**

recent wastewater flows. For the approaches to the lateral, he mostly used the picture-in-picture view with the lateral camera image as the inset. This helped him to “aim” the lateral camera into the opening.

As the main crawler camera traveled, an on-screen footage counter displayed the distance traveled from the manhole. The camera encountered four laterals, two on its right side and two on its left, within the first 54 feet. All four were either blocked, capped or badly broken, and none could be inspected with the lateral camera.

Concepción removed the crawler, reversed its direction, and resumed the demonstration traveling up-

**National Power Rodding, a company of Caryl Corporation, provided one of its pipe inspection vehicles for the demonstration of the LETS system.**

stream. At 5.6 feet from the point of redeployment, Concepción located a lateral on the left side of the main that appeared to be active. He drew the crawler up alongside and used the control panel toggle switches to rotate the lateral camera about 90 degrees.

Alternating between the two picture-in-picture views, he manipulated the controls to insert the lateral camera into the line, then switched to the full-screen lateral camera view, which displayed a footage counter for that camera. As the camera traversed the first few feet of the pipe, it encountered what appeared to be gelatinous solids filling the bottom of the opening.

“It’s hard to tell what that is,” noted Schantz. “It could be a solid slug, it could be fat or grease, or an amalgam of almost anything.” Concepción pushed past the first deposit, and the camera clearly showed two foam packing “peanuts” on the pipe floor. “This lateral is probably connected to a floor drain in a factory,” Schantz stated. “Otherwise, how would packing material get down there?”

By the time the footage counter read 7.0 feet, the pipe was half to two-thirds full of debris. Concepción tried to push through the blockage by extending and retracting the pushrod, then by pushing and pulling the rod with the tractor. When he was unable to break through, he retracted the lateral camera, switched back to the picture-in-picture view, and moved the crawler on down the line.

At the next lateral, a few feet farther down the line, Concepción inserted the push camera and found an apparently faulty installation in which a 6-inch lateral had been shoved into a section of 8-inch pipe coming off the main. This opening was plugged by a large mass of solids that the cam-



era could not penetrate. At 23 feet, Concepción located a 6-inch lateral in which a mineral deposit prevented inspection.

At this point, a buildup of dirt in the mainline kept the crawler from proceeding any farther. Concepción therefore ended the

views gave Concepción considerable flexibility in visualizing the approaches to the lateral openings and in watching the process of lateral camera insertion. Once the lateral camera was in the line, the full-screen view from the lateral camera provided clear images that

**“Laterals have become a very important aspect of trying to identify and pinpoint sources of infiltration and maintain the quality of the sewer system. Using this system, an experienced operator can inspect as many as 40 lateral connections in a day.”**

**Richard Schantz**

demonstration by backing the crawler out of the mainline and retrieving it from the manhole.

#### **Observer comments**

Although the condition of the lateral on this segment of mainline did not enable the use of the LETS’ full 80-foot reach, the demonstration did clearly show the system’s functionality and its advantages as an inspection tool.

LETS appeared to provide a highly efficient means of inspecting sewer laterals from the main. At most of the openings, Concepción had little trouble inserting the lateral camera. Insertion was challenging only when laterals entered from acute angles, requiring the camera to be inserted at angles well beyond perpendicular to the main.

The control system appeared simple to use. The choice of four

would enable an operator to make a good assessment of the pipe’s condition.

The lateral camera provides straight-ahead viewing only, yet with its high-intensity LED lighting still affords a reasonably good view of the pipe walls and their condition. Pan-and-tilt capability, recently made available, enables more detailed views of specific defects.

#### **Manufacturer comments**

“Lateral inspection is part of the mainline inspection business today,” says Schantz. “Laterals have become a very important aspect of trying to identify and pinpoint sources of infiltration and maintain the quality of the sewer system. This is a growing part of the industry, along with lateral cleaning, grouting, lining and other aspects of lateral inspection. Using this sys-

tem, an experienced operator can inspect as many as 40 lateral connections in a day."

"If you did not have this equipment, particularly in older residential and industrial areas, you would not find cleanouts in many locations. They may be buried. They may not be identified. You may not see anything above ground. Here we sit on a back street, and we can look at the buildings on either side and see no apparent cleanouts. Inspection from the main is really the only way in many older cities to determine where the lateral connections are, where they go, and what their condition is.

"We have a system that many contractors have selected because of the ease of operation. The way the front chute is configured, the fact it allows the camera to be rotated left and right, and the fact it can elevate the angle of the camera as it gets launched, all makes it

easy to insert the camera into the lateral.

"Another attribute of this system is that once an operator pushes up a lateral, he can use the tractor to push the camera back and forth, should it get caught. You don't have to rely on just the pusher motor and the pushrod. The tractor motor is a significantly more powerful motor. That gives the operator a fallback position to get over something in the line or, if the camera gets stuck coming back, pull harder to get the push cable out." ♦

#### MORE INFO:

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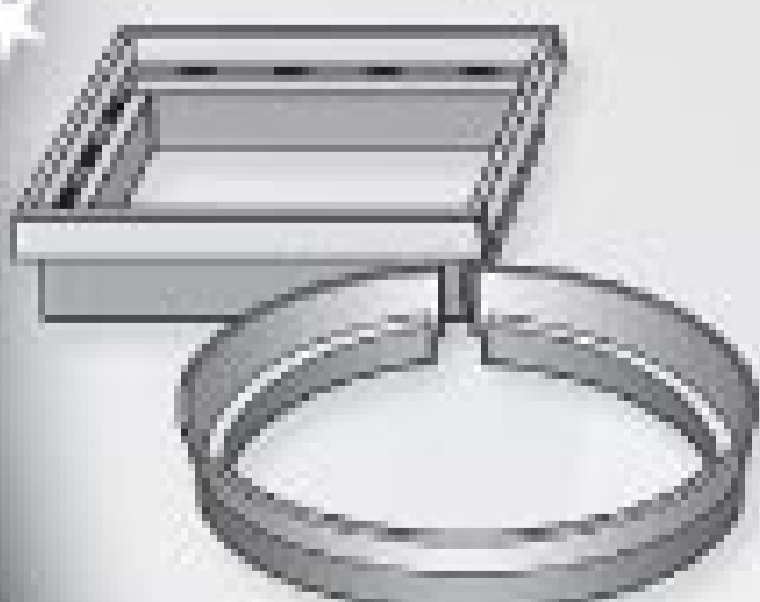
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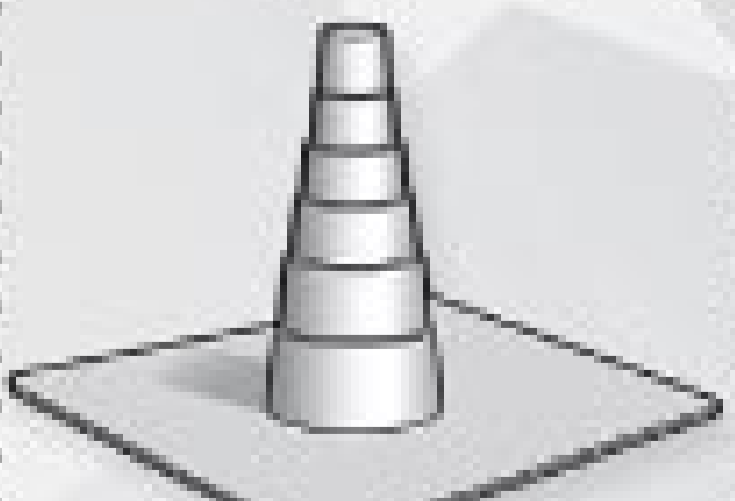
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# AN EXPO ENCORE

On Feb. 27, country favorites from past Saturday Evening Jams will hit the stage to celebrate the 30th Pumper & Cleaner Expo

By Jim Kneiszel

Familiar and fun are words that come to mind when talking about two acts set to headline the special Saturday Evening Jam Revisited show at the 2010 Pumper & Cleaner Environmental Expo International.

Two of the most popular acts in Saturday Evening Jam history return to the stage to help celebrate the 30th Expo: Sawyer Brown (2003 and 2004), and Phil Vassar (2005). The show begins at 5 p.m., and the night of music is included in the registration price of \$30 per person (early registration until Jan. 22) or \$60 at the door.

## Sawyer Brown

Marking 29 years together, touring legends Sawyer Brown are often called the Rolling Stones of country music. Over the years, they've logged more than 3,500 live shows while churning out dozens of chart singles. Formed in Apopka, Fla., in 1981, they entered and won the 1983 *Star Search* competition.

A few years later, they produced a flurry of singles, then really hit their stride in the early 1990s, with increasing country radio airplay and large crowds that enjoyed their energetic stage presence. Major hits for the group, named for a street near their early rehearsal studio, include "Some

Girls Do," "The Dirt Road," "Hard To Say," "Step That Step," "This Time," "The Boys & Me," "Thank God For You," and "The Walk."

Sawyer Brown has put more than 50 songs on the Billboard's Hot Country Songs chart, songs that many Expo fans can sing along to. They add their take to country classics as well, with popular versions of George Jones' "The Race Is On" and Dave Dudley's "Six Days On The Road." As much as their music, the band is known for its hard-charging stage show, which features frontman Mark Miller.

**"We came out of the notion we were there to entertain people, to make sure everybody had a good time. Somebody once told me, 'If you can't have fun at a Sawyer Brown show, you can't have fun.'"**

Mark Miller

Sawyer Brown

"We came out of the notion we were there to entertain people, to make sure everybody had a good time," Miller says. "You're looking at a bunch of blue-collar people here, who were raised to put the work in, to make sure the people are satisfied, and who really love being on that stage and seeing the people letting it all go. Somebody once told me, 'If you can't have fun at a Sawyer Brown show, you can't have fun.'"

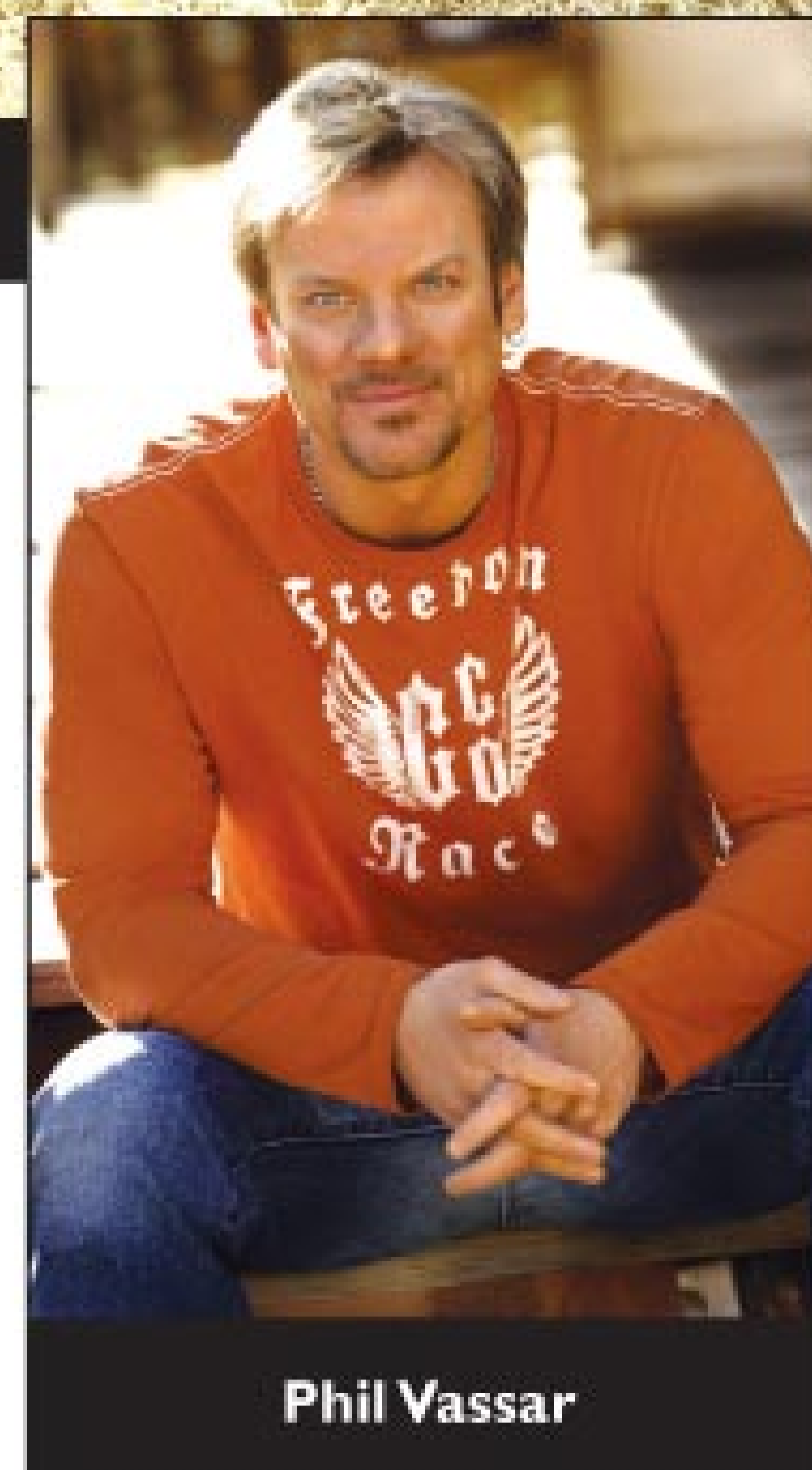


Sawyer Brown

## Phil Vassar

Well before country piano man Phil Vassar wowed the Expo crowd five years ago, he made his name as a songwriter in Nashville with hits including "Right On The Money" for Alan Jackson, "For A Little While" and "My Next Thirty Years" for Tim McGraw, and "I'm All Right" and "Bye Bye" for Jo Dee Messina.

"Bye Bye" helped Vassar win the Songwriter of the Year Award from the American Society of Composers,



Phil Vassar

"People ask me why I still do so many shows, but you work your whole life just to get to the point where people want you to come play," he says. "Even today I still have that work ethic where you feel like if you don't work hard, you're not going to eat. That's something my dad instilled in me and my sisters."

For more information on the Pumper & Cleaner Environmental Expo International, visit [www.pumpershow.com](http://www.pumpershow.com) or call 800/257-7222. ♦

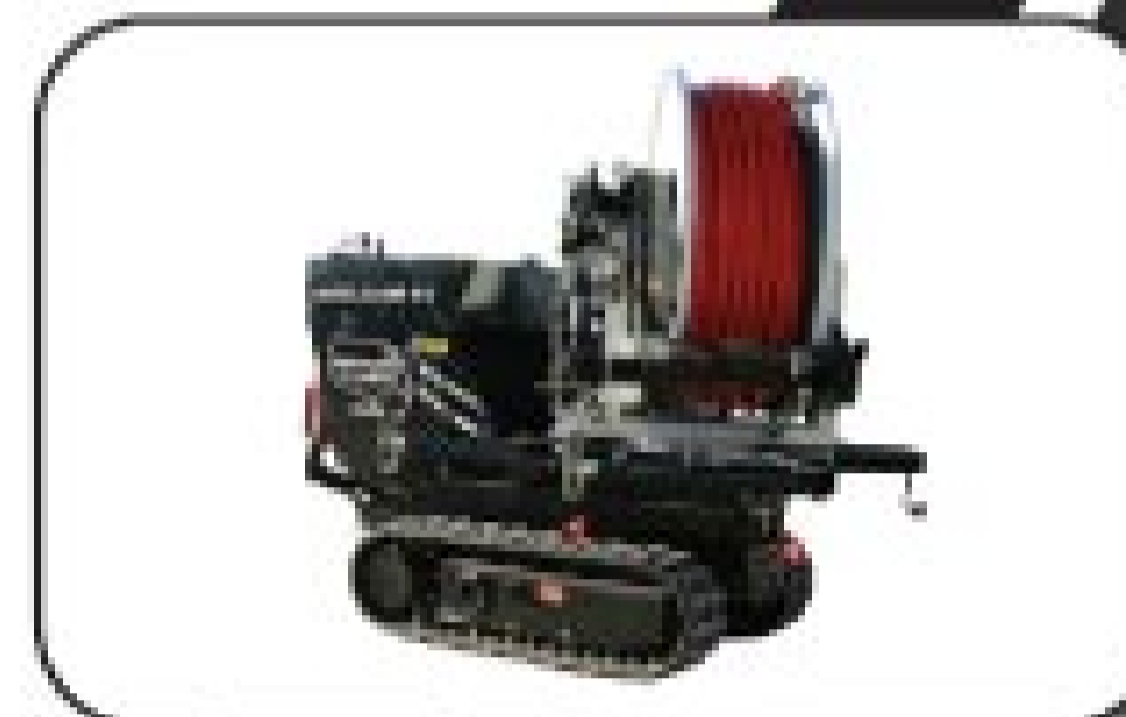
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Vassar then turned toward performing, recording numerous hits over five albums including "Carlene," "Six-Pack Summer," "Love is a Beautiful Thing," and the No. 1 hit, "Just Another Day In Paradise." A Virginia native, Vassar is known for connecting with his audience, especially on themes of family and an American work ethic. He is often called "the hardest working man in country music."

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## SEEING THE FUTURE

Leading a team requires an array of special skills, including the ability to envision the organization's long-term needs

By Ken Wysocky

**D**uring an unprecedented wave of retirements, leadership is a hot issue for water and wastewater utilities. To develop effective leaders to fill the vacuum, management should search for employees who tote crystal balls — figuratively speaking.

"Organizations in general are over-managed and under-led," says Ben Rosen, a Hanes professor of management at the Kenan-Flagler Business School at the University of North Carolina. "They need people who can look to the future and position their organizations so they can be successful.

"Sometimes utilities don't feel the need to change because they don't have competition. In some instances, they're a little more resistant to change and less forward-looking, which makes leadership even more important. Leadership is much more than just managing day-to-day. It requires a big-picture focus. Many managers are so consumed with the present that they don't look to the future."

Good leaders also need to be agents of change — people who can spot trends and see how they affect the organization, then develop ways to respond. Those changes could involve new technology, new regulations, security issues, diseases, changing workforce demographics, privatization, and more.

"In difficult times, budgets might tighten up, or maybe demand for water will suddenly increase," Rosen notes. "Or the way you clean your water may be banned. All these things require the organization to think about how to sustain

itself in the future."

Leaders also need to set high expectations, hold employees accountable, and bring new ideas into organizations.

### Back to school

Along with teaching, Rosen directs UNC's Water and Wastewater Leadership Center, a joint venture between the National Association of Clean Water Agencies (NACWA), the Association of Metropolitan Water Agencies (AMWA), the American Water Works Association (AWWA) and the Water Environment Federation (WEF).

Held once a year in late winter or early spring, the 12-day residential program aims to improve the skills of 25 to 30 up-and-coming leaders. Participants receive 360-degree feedback from peers and talk with a career coach.

"Part of the inspiration for the program is the big wave of retirements," Rosen says. "We get people in from all around the country. There's a tremendous amount of networking and comparing notes, and a lot of valuable information is transmitted during meals and informal conversations."

Graduates also can attend a 2-1/2-day alumni program 18 months later. That session helps participants reconnect with classmates, evaluate their progress and take classes that reinforce the core concepts they learned.

### Leadership traits

So, what are some traits of good leaders? Rosen suggests looking for people who:

**Speak the right language.** "Lea-

ders need to articulate their vision in a way that people can understand it," Rosen says. "They need to create a sense of urgency — light a fire under people and get them excited about change."

**Shape organizational culture.** Leaders must decide what values employees should hold, then empower them to make decisions based on those values. "On any given day, people are faced with decisions," Rosen notes. "Do you want them to decide based on speed, or by quality?"

**Reach out to others.** Working in a vacuum hampers the ability to lead, so leaders must be active in professional organizations, stay well read, network with peers and keep abreast of new technology.

**Are politically savvy.** The ability to understand people, externally and internally, is a key attribute. "The goal is to find overlapping interests where parties can agree and collaborate, rather than adversarial positions," Rosen says.

**Develop a game plan.** Expecting the unexpected — and having a plan to deal with it — is also important. "Maybe the organization is concerned about how some kind of epidemic might affect the water supply, and how to handle staffing if there are lots of sick people," Rosen says. "If so, then they need to develop a contingency plan to handle it. The same is true for integrating new technology." This also means dropping the if-it-ain't-broke-don't-fix-it philosophy in favor of proactively addressing problems.

**Delegate responsibilities.** Assigning tasks to others empowers them

**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 Ted Rulseh at 800/257-7222, or e-mail [editor@mswmag.com](mailto:editor@mswmag.com).

and teaches them new skills, while freeing up time for managers to do big-picture thinking. Managers need to trust employees to whom they delegate tasks. "Often, if you delegate and someone messes up, you take the heat for it," Rosen observes. "So you need to trust people. If they know you trust them, they're not as likely to make mistakes. On the other hand, you need to let them know how much error you'll tolerate. Different organizations have different tolerances for letting people make mistakes."

**Set and act on high priorities.** Good leaders don't put off plans that could make their organizations more innovative. If they invest time in things that aren't deadline-oriented, they'll have the luxury of looking back years down the road, happy they made the time to do so, Rosen notes. A good example is technology, such as electronic meter reading or advanced billing procedures.

### Plan and act

Overall, Rosen emphasizes that good leaders must be able to look to the future, analyze a variety of trends, then develop solutions to meet emerging challenges. "In tough times, you need innovative solutions to problems," he says. "While what you're doing may have got you where you are today, it may not get you where you want to be tomorrow."

To learn more about the Water and Wastewater Leadership Center, visit [www.amwa.net/cs/leadership\\_center\\_site](http://www.amwa.net/cs/leadership_center_site). ♦





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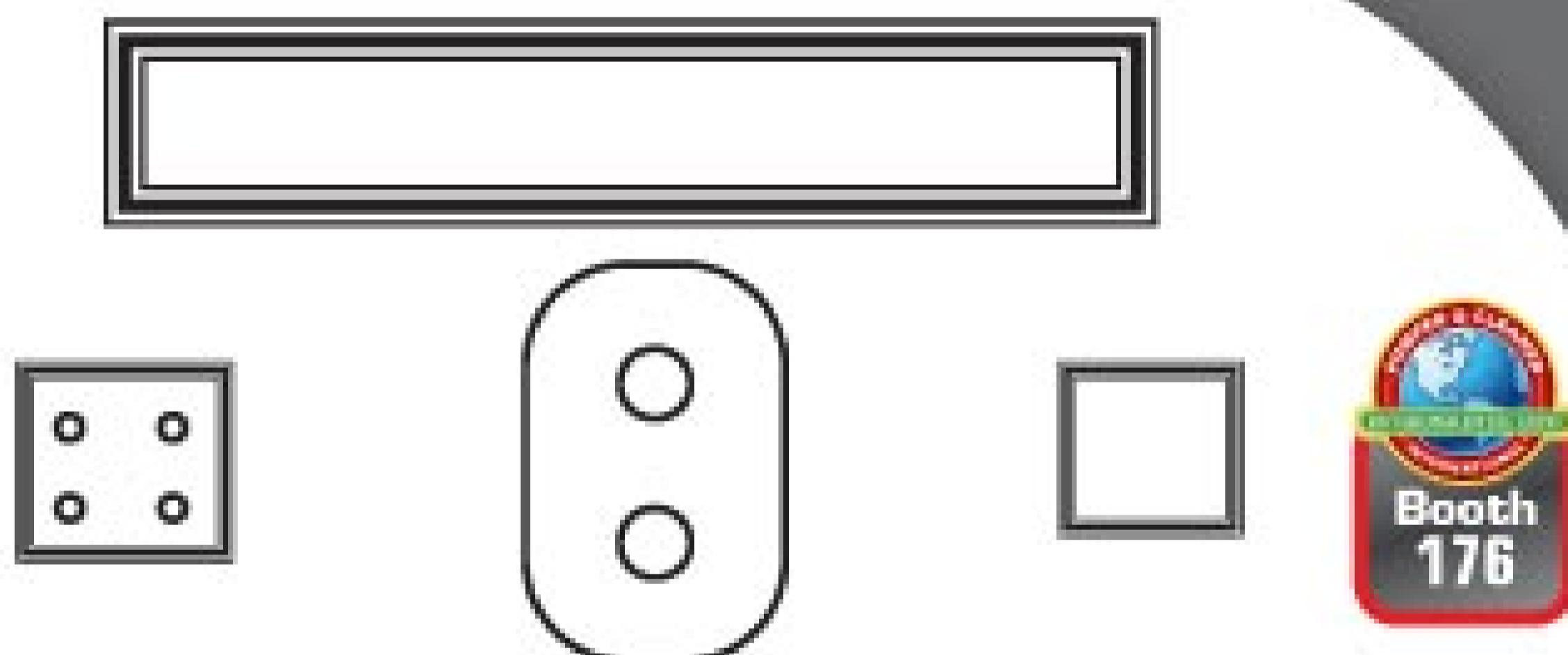
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## SO MUCH TO SEE!

PUMPER & CLEANER ENVIRONMENTAL EXPO EXHIBITORS OFFER A SNEAK PEEK AT THEIR LATEST TECHNOLOGY AND SERVICES

By Ed Wodalski

Anyone who has been to the Pumper & Cleaner Environmental Expo will tell you there's just so much to see. From time-tested products to cutting-edge technology, the challenge is to see it all.

To make sure you don't miss out on any of the new breakthroughs at the Kentucky Exposition Center, show sponsor COLE Inc. has dedicated an area exclusively to new products. The display opens on Wednesday, Feb. 24, for a pre-show sneak peek and will remain open during regular show hours. There's also an interactive floor plan at [www.pumpershow.com](http://www.pumpershow.com) to help you pre-plan your visit.

Here's a look at some of the products and services being featured at the 30th Annual Expo.

### INSPECTION SYSTEMS

#### 1 CUES INC.

The QZ2 portable, pole-mounted video inspection system from CUES Inc. can be operated by one person to perform surveys of pipelines, wet wells, manholes, sewer treatment plants, steam generators, tanks, vessels and other difficult-to-reach areas without confined-space entry. The camera system is mounted on a carbon fiber, adjustable telescopic pole that can extend up to 24 feet. An optional 34-foot pole is available. The system features a 420:1 (35 optical/12 digital) zoom with automatic focus and self-contained, waterproof lighting for enhanced detailed viewing of cracks, breaks, pipe separations, scale and various defects from hundreds of feet away. It also can be used to locate lateral services or identify a blockage at a manhole, access port or other entry point. The unit includes two high-density discharge lights and VIS (video image stabilization) module for sharp and stable images. 800/327-7791; [www.cuesinc.com](http://www.cuesinc.com); Expo booth 1068.

#### 2 RAUSCH ELECTRONICS USA LLC

The M-Series pipe inspection system from Rausch Electronics USA LLC features a single modular and steerable transporter with standard remote electric lift. The system is designed for mainline inspection, mainline and lateral launching, lateral jetting, laser pipe profiling, pressure testing and point repair. 717/709-1005; [www.rauschtv-usa.com](http://www.rauschtv-usa.com); Expo booth 2031.

#### 3 ARIES INDUSTRIES INC.

The LETS mini pan-and-tilt camera from Aries Industries Inc. is designed to inspect lateral lines down to 3 inches in diameter and up to 150 feet from main sewer lines. The inspection system has a built-in 512-Hz sonde for line locating and can operate as a backup mainline camera or a skid-mounted unit for larger pipes. 800/234-7205; [www.ariesindustries.com](http://www.ariesindustries.com); Expo booth 1008.

#### 4 RAPIDVIEW IBAK NORTH AMERICA

The PANORAMO 150 360-degree pipeline scanner system from RapidView IBAK North America is designed for pipelines 6 to 12 inches in diameter. The system uses two 185-degree, wide-angle cameras mounted to the front and rear. As the system moves through the pipeline, the integrated high-power strobes flash, enabling the cameras to capture images of the pipe wall. After inspection, data is compiled to create a complete 360-degree view of the pipeline in a self-contained file. Users can move through the virtual pipeline and take measurements and log defects. The scanner system does not need to stop as it moves through the pipeline and can inspect at up to 40 feet per minute without motion or blur. 800/656-4225; [www.rapidview.com](http://www.rapidview.com); Expo booth 2130.

#### 5 COBRA TECHNOLOGIES

The FastView telescopic zoom camera from Cobra Technologies is a portable system made for evaluation and inspection of manholes, pipes and areas where human entry is impractical or impossible. Designed for single-user operation, the camera functions as a stand-alone unit or with any CCTV system. Videos and images can be transferred to the



office database or GIS system. Features include Cobra lighting system with Luxeon lights, 432:1 zoom for detailed viewing hundreds of feet away and 24-foot extendable pole mount with optional 38-foot mount. 800/443-3761; [www.cobratec.com](http://www.cobratec.com); Expo booth 7063.

#### 6 SHAMROCK PIPE TOOLS INC.

The Bug Eye push camera inspection system from Shamrock Pipe Tools Inc. includes 100 feet of cable, color camera, monitor cable, power cord and large monitor. 225/275-7696; [www.shamrocktools.com](http://www.shamrocktools.com); Expo booth 2203.

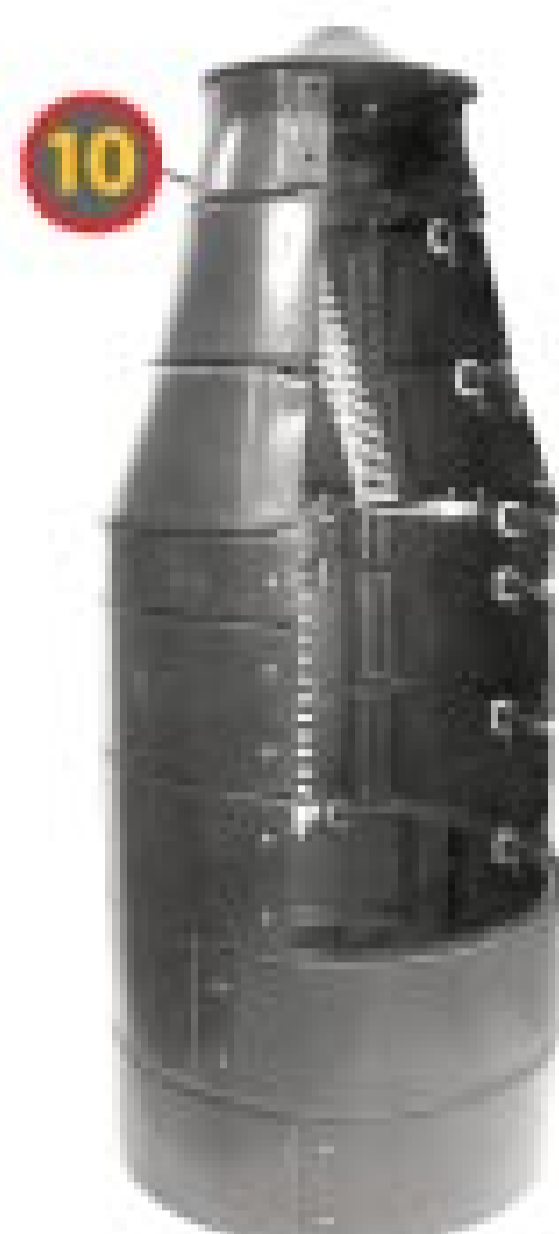
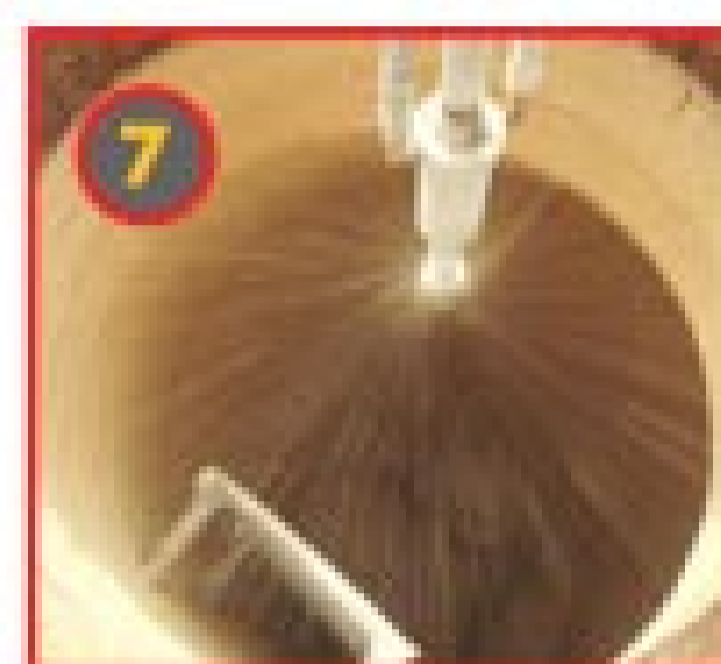
### REPAIR

#### 7 SAUEREISEN INC.

The SewerGard 210 family of protective polymer linings from Sauereisen Inc. is formulated for low permeability to enhance corrosion resistance and extend the longevity of infrastructure, such as manholes and lift stations. Available in several variations to accommodate desired thickness and methods of application, the liner can be spincast, trowled, rolled or applied by airless spray. 412/963-0303; [www.sauereisen.com](http://www.sauereisen.com); Expo booth 4004.

#### 8 SEALING SYSTEMS INC.

The Infi-Shield external seal from Sealing Systems Inc. is designed to prevent erosion and infiltration in manholes and catch basins. The one-piece molded seal is made from EPDM rubber, has a reinforced, pre-formed, L-shaped corner and is



bonded with non-hardening butyl mastic. Made to pass a vacuum test, the shield installs in minutes without special tools. 800/478-2054; [www.ssissealing.com](http://www.ssissealing.com); Expo booth 165.

### 9 FORMADRAIN

The LMC lateral-to-main connection from Formadrain is designed to repair tee and wye sewer connections from 4 inches by 4 inches up to 24 inches by 8 inches. The inflatable rubber tee-shaped tube, once inflated, can seal and structurally repair a 10-inch to 4-inch tee sewer connection. Three access points are required (two manholes and one cleanout inside or outside the building). The system cures in about a half hour and can be used in any type of pipe material. 888/337-6764; [www.formadrain.com](http://www.formadrain.com); Expo booths 4200, 4201.

### 10 INFRASTRUCTURE TECHNOLOGIES INC.

The Monoform ABS interior manhole forming system from Infratech Infrastructure Technologies Inc. is made for pouring new concrete walls and bases for complete rehabilitation of existing manhole structures. It is designed to exceed H-20 traffic loading requirements. Restoration is completed without traffic detours, external sewage bypassing and disruption to adjacent utilities. Custom forms are available for larger structures such as life-station rehab or retrofit. Installation service and on-site training is available. 800/533-4244; [www.infratechonline.com](http://www.infratechonline.com); Expo booth 9059.

### 11 AVANTI INTERNATIONAL

AV-248 Flexseal-LV from Avanti International is a dual-component, water-activated, MDI-based polyurethane resin made to withstand wet/dry cycles. The resin cures to a flexible, closed-cell foam, sealing static or moving cracks and stopping active water

leaks. Engineered as a low viscosity resin to penetrate cracks, it is also effective for use as a large-void filler around structures. 281/486-5600; [www.avantigrout.com](http://www.avantigrout.com); Expo booth 7136.

### 12 INFRASTRUCTURE REPAIR SYSTEMS INC.

Available for laterals as well as mainlines, the Infrastructure Point Repair System is a no-dig, ambient cure spot repair system for any size pipe. The repair kit contains a sewn fiberglass and felt liner that can be customized for most jobs as well as Velcro straps, melt-away strings and pre-measured epoxy formulated for summer or winter. The product is ASTM 1216 certified. 877/327-4216; [www.irsinc.net](http://www.irsinc.net); Expo booth 25.

### 13 BOWMAN TOOL COMPANY

The 2.5-hp, right-angle geared air motor from Bowman Tool Company & Systems delivers 28-38 cfm at 95-105 psi with an average rpm of 10,500. Constructed from aircraft aluminum and heat-treated steel, the air motor is designed for brushing and cutting off protruding laterals. It can be combined with a slitting saw to aid in the removal of bad lining from pipe. The motor measures 5.75 inches long and has a 3-inch square base. It can work in 6-inch and larger relined pipe. 717/432-1403; [www.bowmantool.com](http://www.bowmantool.com); Expo booth 9318.

### 14 MR. MANHOLE

The Six-Shooter manhole frame and lid replacement system from Mr. Manhole is designed to lock into a manhole and cut a circular groove in the road, enabling the frame and lid to be removed without labor. Suitable for high-production crews, the tool replaces the air-hammer and concrete saw method of repair, reducing the chance of worker injury. 419/229-3015; [www.mrmanhole.com/sixshooter](http://www.mrmanhole.com/sixshooter); Expo booth 9149.

### 15 SVE PORTABLE ROADWAY SYSTEMS

The TrakMat ground cover mat system from SVE Portable Roadway Systems Inc. is designed for moving vehicles across lawns, golf courses, special events, and other areas. Made of 100 percent recycled polyethylene plastic, the standard mat is light green in color to prevent it from getting hot and damaging turf. Traction nubs on both sides provide grip. Black mats are available where heat is not a concern. 800/762-8267; [www.trakmats.com](http://www.trakmats.com); Expo booth 6189.

## MAINTENANCE

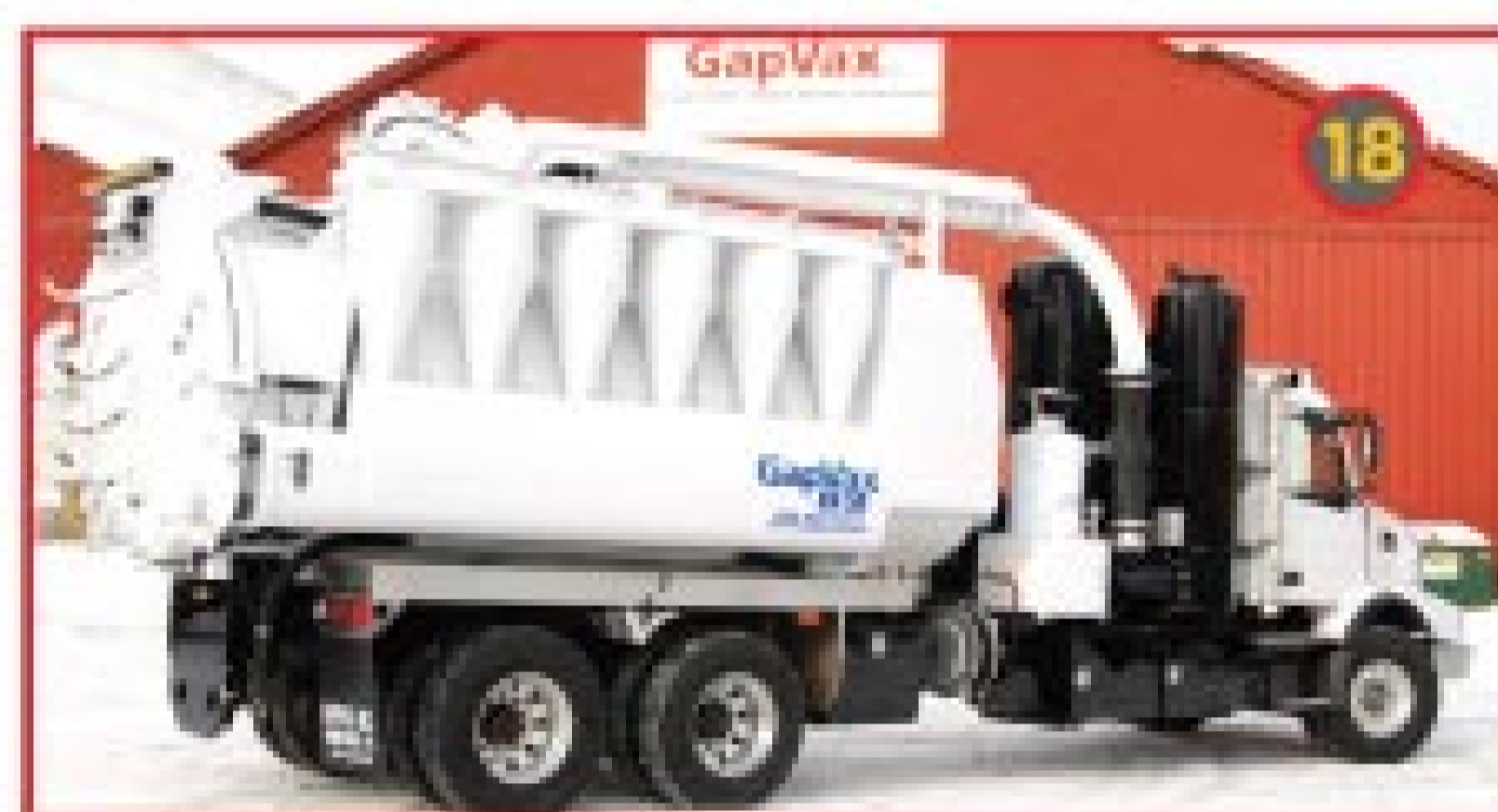
### 16 WASTEQUIP-CUSCO

The Industrial Vac series from Cusco, a division of Wastequip Co., features a hydraulic-operated, full-opening rear door and lift system. Designed for the removal of liquids and semi-solid waste, the standard unit offers pressure off-loading and has a vacuum system ranging from 350 cfm to 670 cfm and 28 inches Hg. Options include a high-pressure wash system, stainless steel tank, heated valves, hydraulic vibrator, transfer pump, as well as DOT and TC 407/412 configurations. 800/490-3541; [www.wastequip-cusco.com](http://www.wastequip-cusco.com); Expo booth 4041.

### 17 DITCH WITCH

The FX20 vacuum excavator from Ditch Witch is designed for cleaning valve boxes, commercial and residential debris cleanup and landscaping, exposing utility lines, posthole digging and many other small, short-run projects. Offering 540 cfm of suction, the 27-hp excavator has a 150-gallon spoils tank permanently mounted at a 45-degree angle. The unit can be transported on the back of a pickup truck, flatbed or small trailer. No CDL is required. 800/654-6481; [www.ditchwitch.com](http://www.ditchwitch.com); Expo booth 9048.

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**18 GAPVAX INC.**

HV-56 hydroexcavator from GapVax Inc. is designed for wet or dry vacuum work with no visible dust emissions. The unit has a 17-cubic-yard payload, while its single-stage filtration eliminates wet or dry changeover. Jet flow ranges from 3-40 gpm with 350-, 550-, 1,000- and 1,200-gallon water capacity. It operates at 1,000 to 3,000 psi and 5,300 cfm at 28 inches Hg. The unit has a 25-foot boom and is made to operate in cold weather and remote locations. 814/535-6766; [www.gapvax.com](http://www.gapvax.com); Expo booth 1022.

**19 VACALL**

The AllJetVac vacuum combination sewer cleaner from Vacall features pumps from 16 to 27 inches Hg, three-stage filtration system for reduced maintenance/noise and an 8-foot, 6-inch telescopic boom. Debris is collected in the fabricated steel body. Jetting hose reels on the front and rear are equipped with a standard high-torque, direct-drive planetary gearbox and hydraulic cushion valve. Aluminum water tanks are fully baffled and mounted to a subframe for durability and stability. An electrical harness is connected to the control panel with a single, color-coded and numbered multipin connector. Safety features include tailgate and debris body safety props that are operated from ground level. 330/339-2211; [www.vacallindustries.com](http://www.vacallindustries.com); Expo booth 5171.

**20 SUPER PRODUCTS LLC**

The Camel sewer and catch basin cleaner from Super Products LLC features a single control panel setup, ejector plate unloading for cleaner debris removal and washdowns, and a single-engine design for lower fuel costs, maintenance and sound level. Units are available with hydroexcavation features and an optional water recycling system. 800/837-9711; [www.cameleasy.com](http://www.cameleasy.com); Expo booth 1054.

**21 SUPERVAC 2000**

The 6,400-cfm Hydrovac from Supervac 2000 features a fully accessible, full aluminum acoustical, insulated enclosure. It has a 3,000-gallon debris tank and 1,200-gallon water tank with 25-foot boom and 320-inch arc. Other features include an 880-Btu diesel boiler, programmable diesel heaters, adjustable water pump-pressure with all functions controlled by a pendant control panel and wireless remote. 866/839-5702; [www.supervac2000.com](http://www.supervac2000.com); Expo booth 7031.

**22 NLB CORP.**

The Saflex-2000 semi-automated tube lancer from NLB Corp. is made for waterjet cleaning the inside diameter of tubes and features a hose-drive system powerful enough to drive hoses with an outside diameter of 4 to 15 mm at pressure to 40,000 psi. The unit enables the operator to position the lances against the tube bundle and index them forward using the controls on the hand lance. The flow of the high-pressure water can be started and stopped with the optional foot box. 800/441-5059; [www.nlbcorp.com](http://www.nlbcorp.com); Expo booth 7095.

**23 STONEAGE INC.**

The Torus 3-D tank-cleaning tool from StoneAge Inc. is a direct replacement for the Hurricane and CyClean and is capable of handling pressures from 5,000 to 22,000 psi by changing the manifold and inlet coupling. Three bolt-on manifolds that control flows from 17-80 gpm are available. The system features a durable magnetic speed control for various applications. Accessories include the TR 408-SS Cage Centralizer for use where debris or internal structures could interfere with the cleaning operation as well as Extension Nipples and Positioning Booms for vessels over 12 feet in diameter. 866/795-1586; [www.stoneagetools.com](http://www.stoneagetools.com); Expo booth 4133.

**24 GAMAJET CLEANING SYSTEMS**

The E-Z8 rotary pressure washer is designed to clean wet wells, lift stations and manholes without the need for confined entry. The system delivers up to 1,000 psi and a flow rate of 130 gpm. A choice of nozzles and stators are available. 610/408-9940; [www.gamajet.com](http://www.gamajet.com); Expo booth 8155.

**25 CAM SPRAY**

The Model SK45018D trailer jetter from Cam Spray delivers 18 gpm at 4,000 psi. Powered by a 66-hp Kubota diesel engine, the jetter has electric two-speed control and over-center clutch drive. Features include a 500-foot by 1/2-inch hose on a hydraulic, variable-speed swivel reel, five-plunger pump, four-nozzle kit, 325-gallon water tank, power pulse, single-axle 6,000-pound trailer, anti-freeze tank, lockable tool storage, wash down gun, Tiger Tail hose, and hydrant fill. 800/648-5011; [www.camspray.com](http://www.camspray.com); Expo booth 3069.



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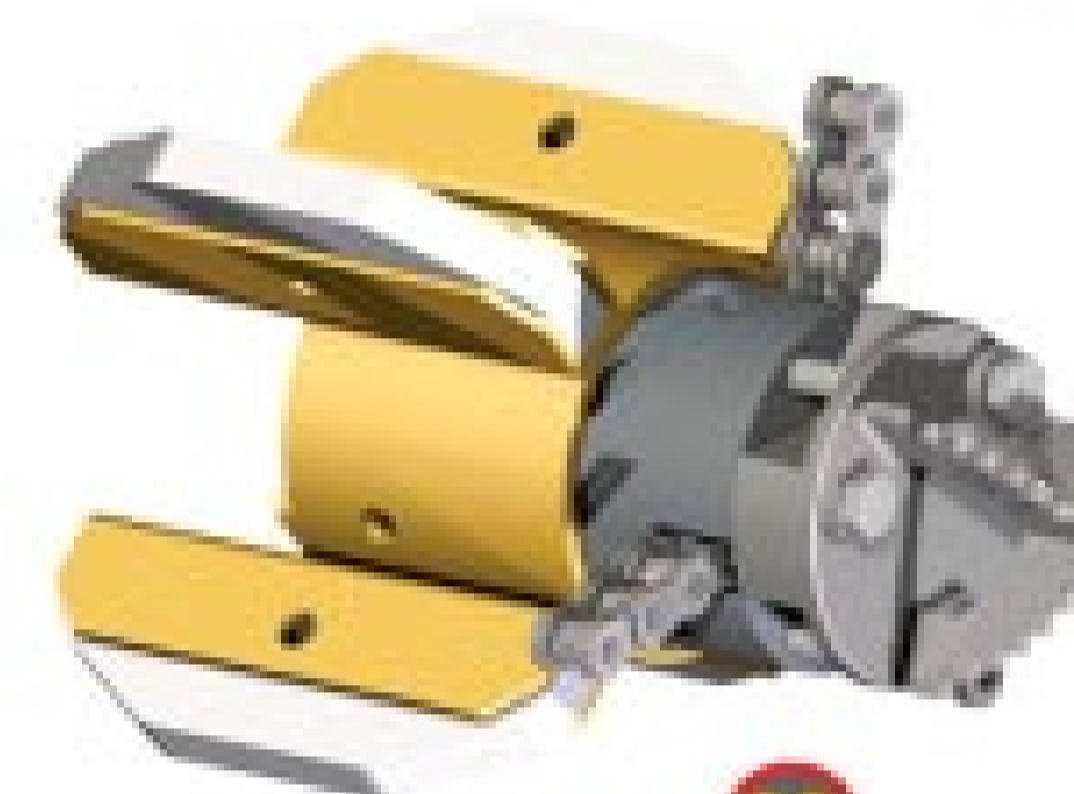
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## 26 E.H. WACHS CO.

The VMT-2 valve maintenance trailer from E.H. Wachs Co. features a power-tilting, rear-facing 200-gallon spoils tanks and aft-mounted ERV-750 valve exerciser. An optional 300-gallon spoils tank is available. Designed for curbside use, the single-operator unit has a 13-foot reach and 750 ft-lbs of torque. It requires no auxiliary power and is equipped with Intelligent Automation and VITALS software that captures data and links to GIS desktop. Powered by a 27-hp gasoline engine, it has three-stage filtration, electro-hydraulic dumping system and fully welded steel box and section frame. 800/323-8185; [www.ehwachs.com](http://www.ehwachs.com); Expo booths 4026, 4027.

## 27 MAX-LIFE MANUFACTURING CORP.

The Vac-Trap manhole debris catcher from Max-Life Manufacturing Corp. connects to the suction tube, replacing the crown nozzle. Resting at the bottom of the invert in the sewer manhole, the basket fills with debris as water flows through. Once the trap is full, the contents can be vacuumed up. The debris catcher is available in 6- to 24-inch sizes and flanged to fit 6- or 8-inch tubes. 714/898-4830; [www.flexmax.com](http://www.flexmax.com); Expo booth 22.

## 28 HANNAY REELS

The Series 6200 high-pressure reel from Hannay Reels features a 1-inch FxF NPT 90-degree sealed ball-bearing, swivel-joint inlet with packing replacement and adjustable packing design. The outlet has a welded 1-inch female NPT thread. Other features include direct-drive hydraulic rewind motor, one-piece steel hub/axle assembly rated at 6,000 psi and roller arm guide on the front of the frame. Assorted hose packages are available. 877/467-3357; [www.hannay.com](http://www.hannay.com); Expo booth 3161.

## 29 SUPERIOR SIGNAL COMPANY LLC

The 5E Electric Smoker from Superior Signal Company LLC, designed to detect leaks and odors, comes complete with hose. Weighing 8 pounds, the smoker is available in 110-volt AC or 12-volt DC. The unit connects to any cleanout or vent. 800/945-8378; [www.superiorsignal.com](http://www.superiorsignal.com); Expo booth 6141.

## 30 USABLUEBOOK

Turbo-charged, truck-mounted CIC Powerboxes from USA BlueBook provide on-site power without using your truck battery. The units supply up to six hours of working power, recharging off your alternator. It can run power saws, grinders, drills, impact wrenches and air tools. Or use it to inflate tires. The DC output can power winches or boost-start backhoes, tractors and bulldozers. Models are available with built-in hydraulic power. The units deliver up to 4,000 watts, supplying 2,000 watts of continuous power, 100-psi air power and 2,100 cranking amps of emergency power. Boxes feature built-in lights and are available with radio, CD, TV and DVD options. 800/548-1234; [www.usabluebook.com](http://www.usabluebook.com); Expo booth 9161.

## NOZZLES AND HOSES

## 31 NOZZTEQ INC.

The BL Swiper sewer cleaning nozzle from NozzTeq Inc. is made for pipes 8 to 18 inches in diameter. The nozzle combines the water flow from the jets and air flow in the pipe. The water flow, through the pressure in the jets, creates a jet stream and thrust through air channels in the center of the nozzle for maximum cleaning and minimum water usage. 866/620-5915; [www.nozzteq.com](http://www.nozzteq.com); Expo booth 8181.

## 32 ENZ USA INC.

The 10.125TR turbine-driven root-cutter nozzle from Enz USA Inc. can be used with both clean and recycled water in pipes from 5 to 12 inches in diameter. The jetter has a low rotation speed, while maintaining high torque. It can remove grease, solid and semi-solid sediments, mineral deposits, concrete, grout wash and other debris. The nozzle requires a 3/4- or 1-inch hose connection. A variety of attachments are available. 630/692-7880; [www.enzusainc.com](http://www.enzusainc.com); Expo booth 67.

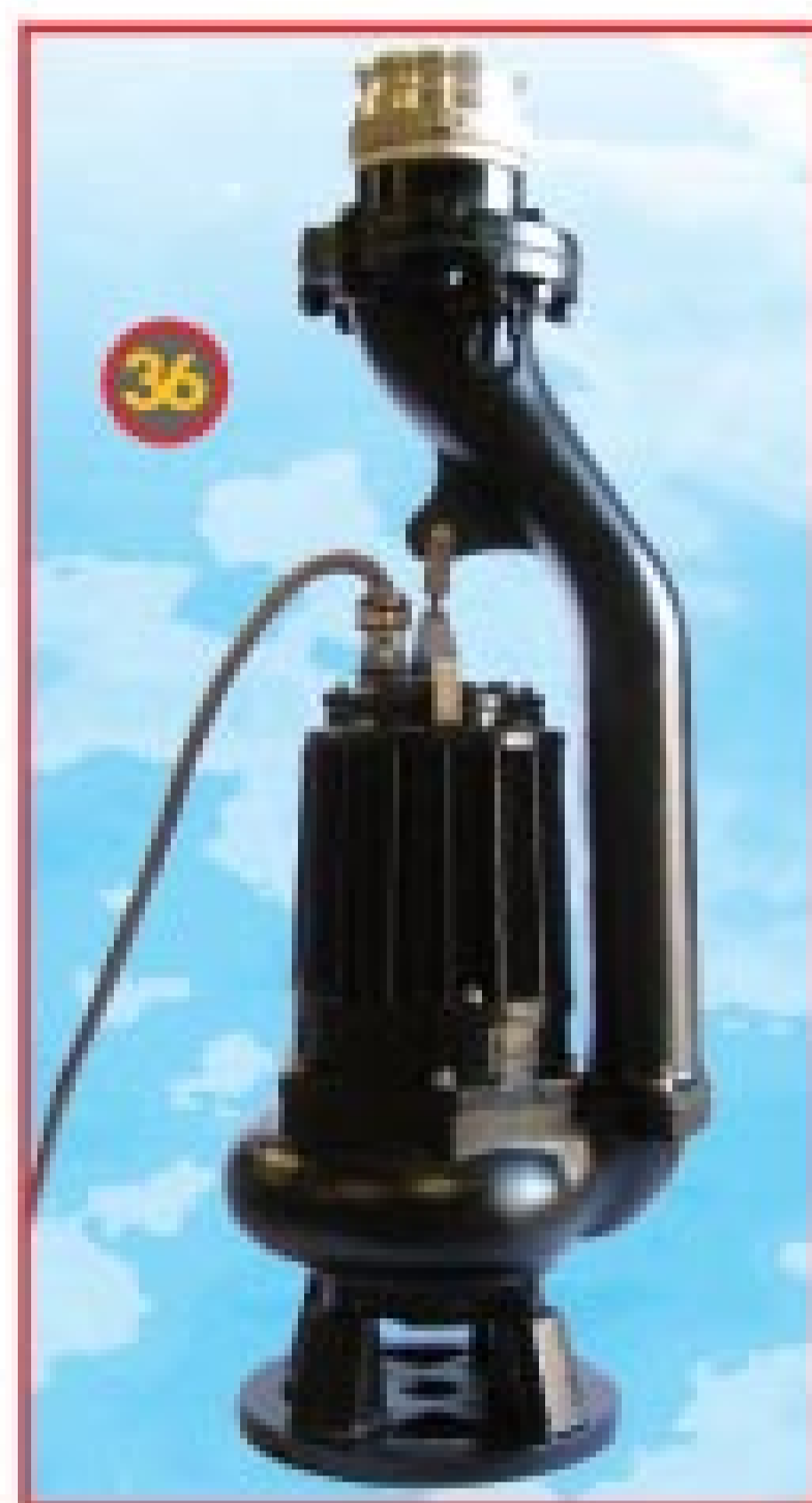
## 33 USB-SEWER EQUIPMENT CORP.

The vibrating Rocker Nozzle from USB Duesen GmbH is made to remove the toughest deposits, such as calcium and concrete from the bottom of 4- to 24-inch pipelines. The offset rotation of the rotor causes aggressive vibration that breaks up the deposits. The stainless steel nozzle with ceramic inserts is intended for use in plastic, HDPE, PVC, and cast-iron pipes. No lubrication is required. 770/984-8880; [www.usbsec.com](http://www.usbsec.com); Expo booth 52.

## 34 PIRANHA HOSE PRODUCTS INC.

The 1 1/2-inch, 2,500-psi cleaning hose from Piranha Hose Products Inc. is made of yellow, polyolefin tube, a double layer of synthetic fiber braids and an abrasion-resistant orange cover. It has a temperature range of 150 degrees F (66 degrees C). A Slither slick cover is available for those tough sewer bends. 800/250-5132; [www.piranhahose.com](http://www.piranhahose.com); Expo booth 6123.

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**35 WJTA**  
 WaterJet Technology Association

**EDUCATIONAL MATERIALS**
**35 WATERJET TECHNOLOGY ASSOCIATION**

Recommended Practices for the Use of Industrial Vacuum Equipment from the WaterJet Technology Association is a guide for setting up and operating a safe industrial vacuum project. Created for industrial vacuum equipment users or individuals who contract out for industrial vacuum services, topics include injury potential, damage and explosions, types of trucks, getting started, pre-job setup, working safely, job completion, load/off-loading, equipment maintenance, regulations and certifications. A glossary is included. A companion video offering a visual depiction of many of the major topics in the guide is available. 314/241-1445; [www.wjta.org](http://www.wjta.org); Expo booth 6127.

**PUMPS**
**36 MODY PUMPS INC.**

The 6-inch MH 480 submersible manhole pump from Mody Pumps Inc. is a modified 10-hp MS 482 pump made to fit inside a 21-inch drainpipe manhole. Designed for emergency operations due to clogged sewage drainpipes and as a sewer bypass pump, the unit has a maximum flow of 1,100 gpm, maximum discharge head of 60 feet and can handle up to 3-inch solids. 661/392-7600; [www.modypump.com](http://www.modypump.com); Expo booth 7166.

**37 HAMMELMANN CORP.**

The 1,000-hp HDP-750 pump from Hammelmann Corp. can deliver up to 43,500 psi and flow rates exceeding 450 gpm. Features include vertical five-cylinder design, stainless steel stress-free head, cross-head piston bellows seal, choice of application specific seal assemblies, solid ceramic or tungsten carbide plungers and choice of bronze or stainless steel suction chamber. Other features include twin helical integral reduction gear with crankshaft supported by four bearings and pressurized oil lubrication system with oil cooler/filter. 800/783-4935; [www.hammelmann.com](http://www.hammelmann.com); Expo booth 5127A.

**38 CAT PUMPS**

Made for sewer cleaning and vacuum trucks, the portable, hydraulic-powered 3CP and 5CP high-pressure pump systems from CAT Pumps deliver from 1,000 to 5,000 psi and flows from 2 to 25 gpm. The pumps offer a compact footprint for tight space installation and operate by using existing power from hydraulic equipment. Cleaning options include Mag-Jet jetter, chemical injectors, guns, lances and nozzles. 763/780-5440; [www.catpumps.com](http://www.catpumps.com); Expo booth 4068.

**39 GARDNER DENVER WATER JETTING SYSTEMS INC.**

The HC convertible pump line from Gardner Denver Water Jetting Systems Inc. permits the conversion of a single pump from 10,000 psi to 15,000 psi by changing the plungers, packing and packing backup rings. The pump line does not require valve and stuffing box replacement. 281/448-5800; [www.waterjetting.com](http://www.waterjetting.com); Expo booth 5031.

**TECHNOLOGY**

**CYCLOPS ELECTRONICS INC.** (NO IMAGE)  
 P.I.D.S. pipeline inspection data software from Cyclops Electronics Inc. is PACP 4.4 certified. 830/249-9756; [www.cyclopsy.com](http://www.cyclopsy.com); Expo booth 4196.

**40 SAVATECH CORP.**

The Sava-Sklar Testboy pressure, vacuum or water-test system from Savatech Corp. is designed for verifiable, certified line acceptance testing of pipelines and manholes. The system can be used for rehabilitation, new construction, repairs or leak detection. It performs ASTM standard tests, records digitally and prints out tests results in a precision time-scale graph. It also reports all test parameters and test performance during a specified time. Tests are certified using ASTM standard and cannot be tampered with or altered. 888/436-9778; [www.savatech.com](http://www.savatech.com); Expo booth 9037.


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# FULL SPEED AHEAD

Committees help NASSCO make critical progress in initiatives including software validation, CIPP training, and government relations

By Irvin Gemora

**O**ften when I speak about NASSCO, I talk about the organization as a whole, a leader for more than 30 years in setting standards for rehabilitation of underground utilities.

But the untold story deserving attention is the engine behind our organization — the many moving parts that make us whole. That's our small but dedicated staff, the 15 committees, and the four divisions comprised of members each doing their part to make NASSCO what it is. Each of these groups has a team of dedicated folks exploring key areas of focus for our entire industry.

Here are a few highlights of committee activities.

## Software validation

The Software Vendor Committee has prepared an online service to validate the accuracy of PACP, LACP and MACP export files. NASSCO has been certifying the software vendors to the latest standard, version 4.4.

To pass certification, vendors must import the most current version from all of the PACP or MACP versions that have been released for certification. Vendors should also report invalid data and export appropriately to the current standard database. Vendors who have passed the certification are listed on the NASSCO Web site. NASSCO recommends verification of PACP certification.

For those looking for software, NASSCO now offers *Data Collec-*

*tion Software Recommendations*, a helpful guide available for download on the Web site. It provides a roadmap for determining which data collection software is right for your needs.

## Updated styrene document

NASSCO's CIPP Committee reviews general matters related to the CIPP industry, including legislative and technical and quality issues. It also supports and works with the NASSCO staff and board to promote public education on pipe-lining issues and benefits.

During the past year, the committee played an important role in the Inspector Training and Certification Program for CIPP, an industry first. The committee updated the "Guideline for the



Use and Handling of Styrenated Resins in Cured-in-Place Pipe." The document was updated to include modifications that deal with handling and labeling of wetout tubes.

## Government relations

The American Recovery and Reinvestment Act of 2009 allocated \$4 billion for clean water projects that improve water quality and protect public health. The dollars have been given to each state to distribute through their revolving funds.

Half of the funds must be designated as grants, and the additional dollars are given as loans. Although the projects that were applied for have been engineered and are ready to begin, red tape has caused delays. States intend to have these projects ready for bid in the months to come. To find out where the money is being distributed in your state, contact your local environmental agency or visit <http://www.epa.gov/ogwdw/dwsrf/nims/dwagency2.pdf>.

There is a lot of positive activity at NASSCO, and I've just scratched the surface. But NASSCO's engine is in full-speed mode, and you're invited to join the ride. Visit us at [www.NASSCO.org](http://www.NASSCO.org). ♦

Irvin Gemora is executive director of NASSCO. He can be reached at [director@nassco.org](mailto:director@nassco.org). The NASSCO headquarters is at 11521 Cronridge Dr., Suite J, Owings Mills, MD 21117.


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## PEOPLE / AWARDS

**Charles Firlotte**, president and CEO of Aquarion Company, has been named president of the National Association of Water Companies board of directors. Also named to the board were **Sandra C. Sullivan**, vice president of government and industry relations for Veolia Water North America; and **Maureen P. Westbrook**, vice president of customer and regulatory affairs for Connecticut Water Company.

**Dr. Jaehong Kim** of the Georgia Institute of Technology received the Paul L. Busch Award from the Water Environment Research Foundation's Endowment for Innovation in Applied Water Quality Research.

The American Public Works Association announced that **Larry T. Koehle**, director of public works and engineering for Caledon, Ontario, is the new president of the board of directors. Re-elected as APWA board members were **Edward Gottko**, **David L. Lawry**, **Larry Stevens**, **Doug Drever** and **Patricia Hilderbrand**. New board members are **Daryl Grigsby** and **Ronald J. Calkins**.

## LEARNING OPPORTUNITIES

### American Public Works Association

APWA is offering an audio/Web broadcast course on Succession Planning: Growing Your Own Director, on Feb. 18. Visit [www.apwa.net](http://www.apwa.net).

### American Water Works Association

AWWA announced the publication of the second edition of *The Water Dictionary*, a desk reference providing definitions for more than 15,000 water- and wastewater-related words and phrases. Visit [www.awwa.org/bookstore](http://www.awwa.org/bookstore).

## CALENDAR

### Feb. 8-10

SPAR 2010: 3D Imaging & Positioning for Engineering, Construction, Manufacturing, The Woodlands Waterway Marriott Hotel & Convention Center, The Woodlands, Texas. Visit [www.asce.org](http://www.asce.org).

### Feb. 20-24

GeoFlorida: Advances in Analysis, Modeling & Design, West Palm Beach, Fla. Visit [www.asce.org](http://www.asce.org).

### Feb. 21-24

The Utility Management Conference, InterContinental San Francisco, San Francisco, Calif. Call 703/684-2441 or visit [www.wef.org](http://www.wef.org).

### Feb. 24-27

Pumper & Cleaner Environmental Expo International, Kentucky Exposition Center, Louisville, Ky. Call 800/257-7222 or visit [www.pumpershow.com](http://www.pumpershow.com).

### March 1-3

Pretreatment, Pollution Prevention and Stormwater Conference 2010, Long Beach, Calif. Visit [www.cwea.org](http://www.cwea.org).

### March 7-10

Cities of the Future 2010, Boston Marriott Cambridge, Boston, Mass. Visit [www.wef.org](http://www.wef.org).

### March 29-31

2010 American Water Resources Association Spring Specialty Conference: GIS & Water Resources VI, Rosen Shingle Creek Hotel, Orlando, Fla. Visit [www.awra.org](http://www.awra.org).

### University of Wisconsin

The University of Wisconsin Department of Engineering-Professional Development is offering a course in Designing Wastewater Pumping Systems and Lift Stations in Madison April 21-23. Visit <http://epdweb.engr.wisc.edu>.

### Kansas Water Environment Association

The KWEA is offering the following courses:

- Feb. 2-3 – Basic Water Laboratory, Abilene
- Feb. 2-3 – Cross Connection/Backflow Informational, Great Bend
- Feb. 2-5 – Cross Connection/Backflow Certification, Great Bend
- Feb. 4-5 – Cross Connection/Backflow Recertification, Great Bend
- Feb. 9 – Safety, Dodge City
- Feb. 10-11 – Advanced Operator School, Kansas City
- Feb. 17-18 – Basic Electrical, Medicine Lodge
- Feb. 23 – Ethics, Liberal
- Feb. 25 – Small Water Systems, Dodge City
- March 2 – Applied Math for Operators, Hays
- March 4-5 – Water Treatment, Phillipsburg
- March 9 – Basics of Water Operations, WaKeeney
- March 9-12 – Cross Connection Control and Backflow Prevention, Kansas City
- March 10-11 – Treatment, Fort Scott
- March 25 – Small Water Systems, Kinsley

Visit [www.kwea.net](http://www.kwea.net).

### Wisconsin Department of Natural Resources

The Wisconsin DNR has these courses:

- Feb. 17 – Preventative Maintenance, Chippewa Falls
- Feb. 18 – Cross Connection Control, Chippewa Falls
- Feb. 18 – Leak Detection, Chippewa Falls
- March 9-11 – Water Supply, Sun Prairie
- March 16-18 – Water Supply, Sun Prairie
- March 30-31 – Water Supply, Fond du Lac

Visit [www.dnr.state.wi.us/org/cs/science/opcert/training.htm](http://www.dnr.state.wi.us/org/cs/science/opcert/training.htm). ♦

*Municipal Sewer & Water* invites your national, state or local association to post notices and news items in this column. Send contributions to [editor@mswmag.com](mailto:editor@mswmag.com).

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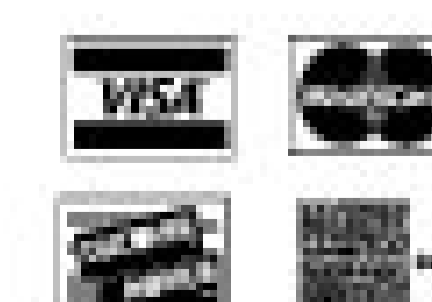
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