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FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE PROFESSIONALS

December 2010

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AND RON HIGHTOWER

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MOTOR CITY RENAISSANCE

Sam Smalley and his
team make strides
to restore Detroit's
infrastructure

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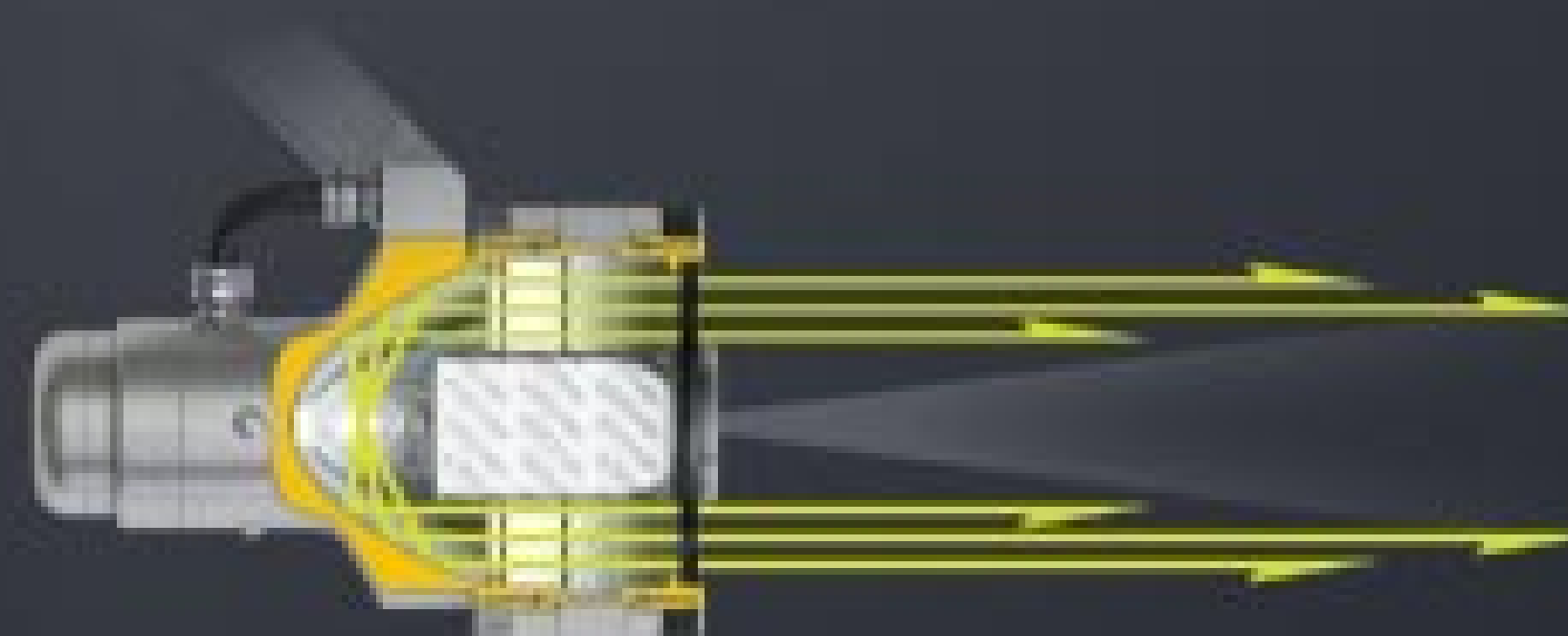
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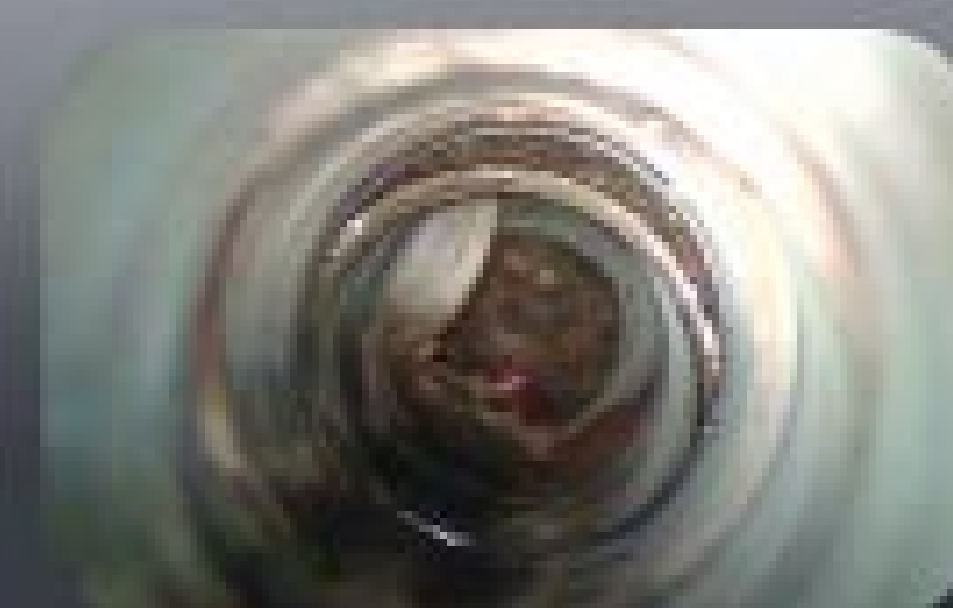
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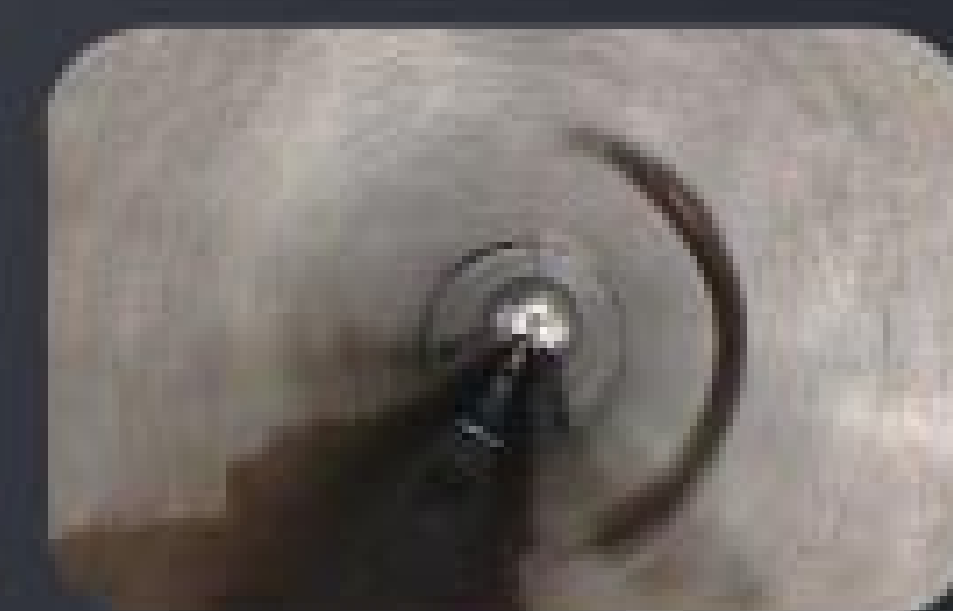
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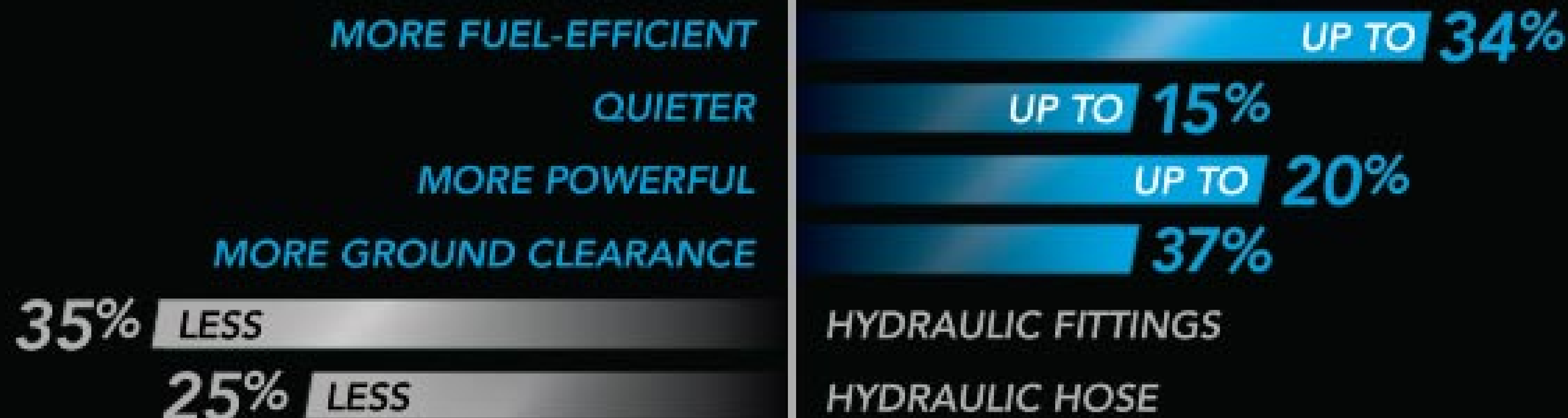
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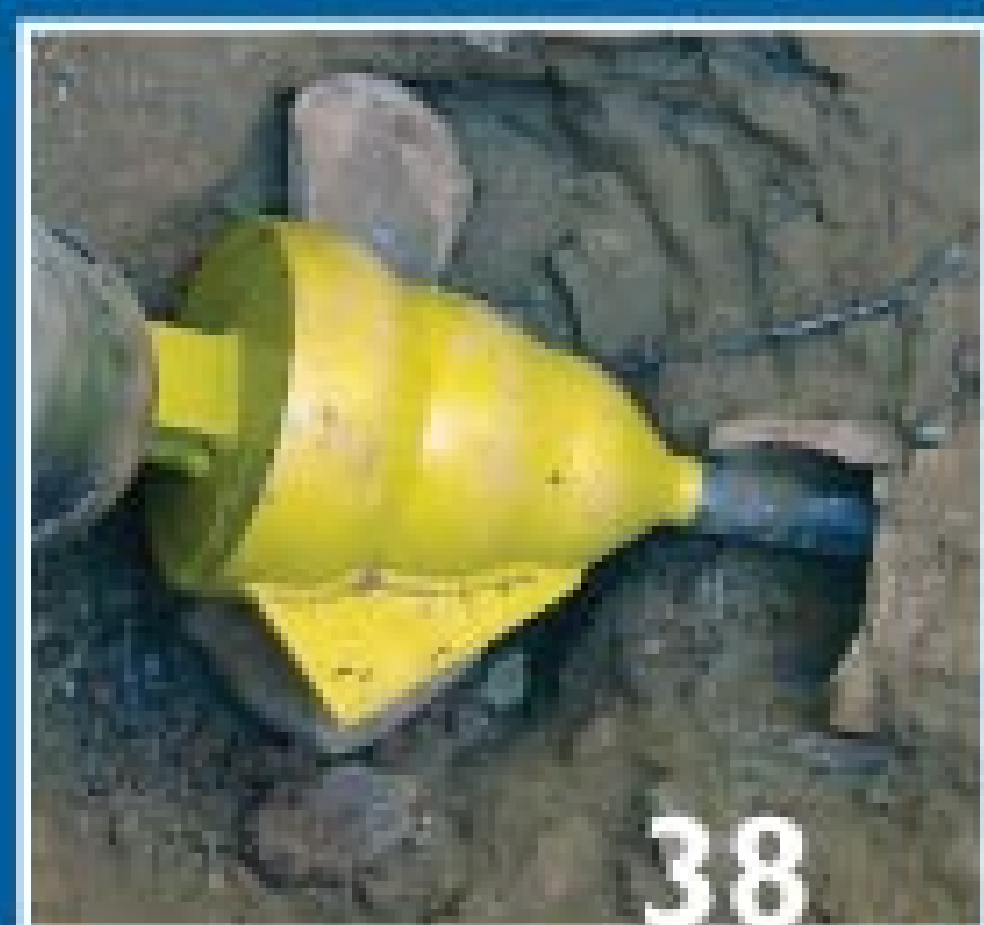
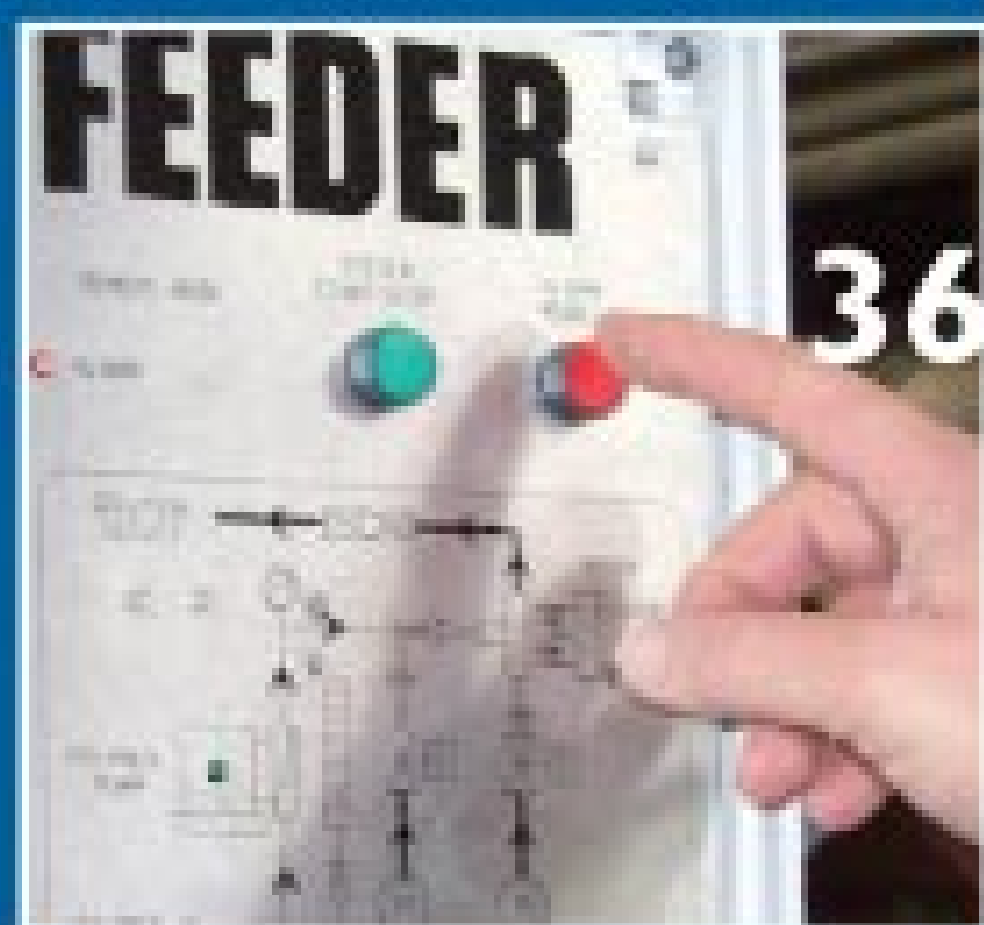
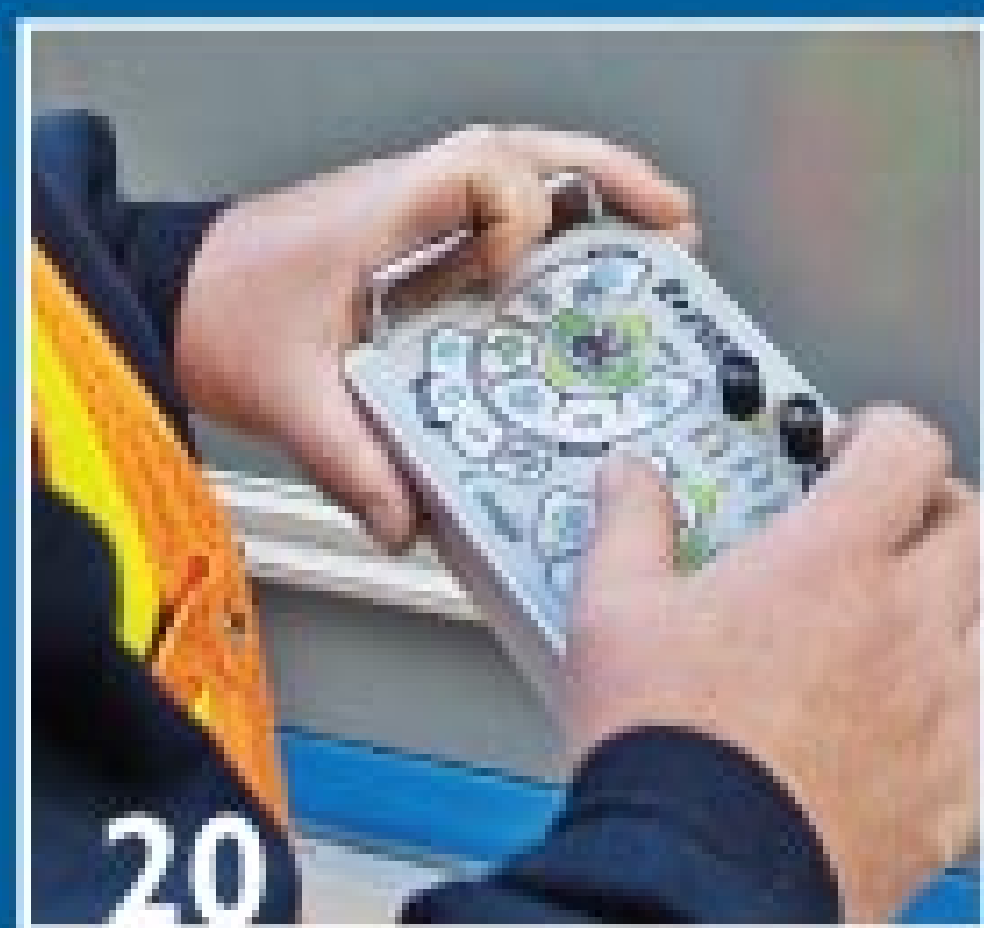
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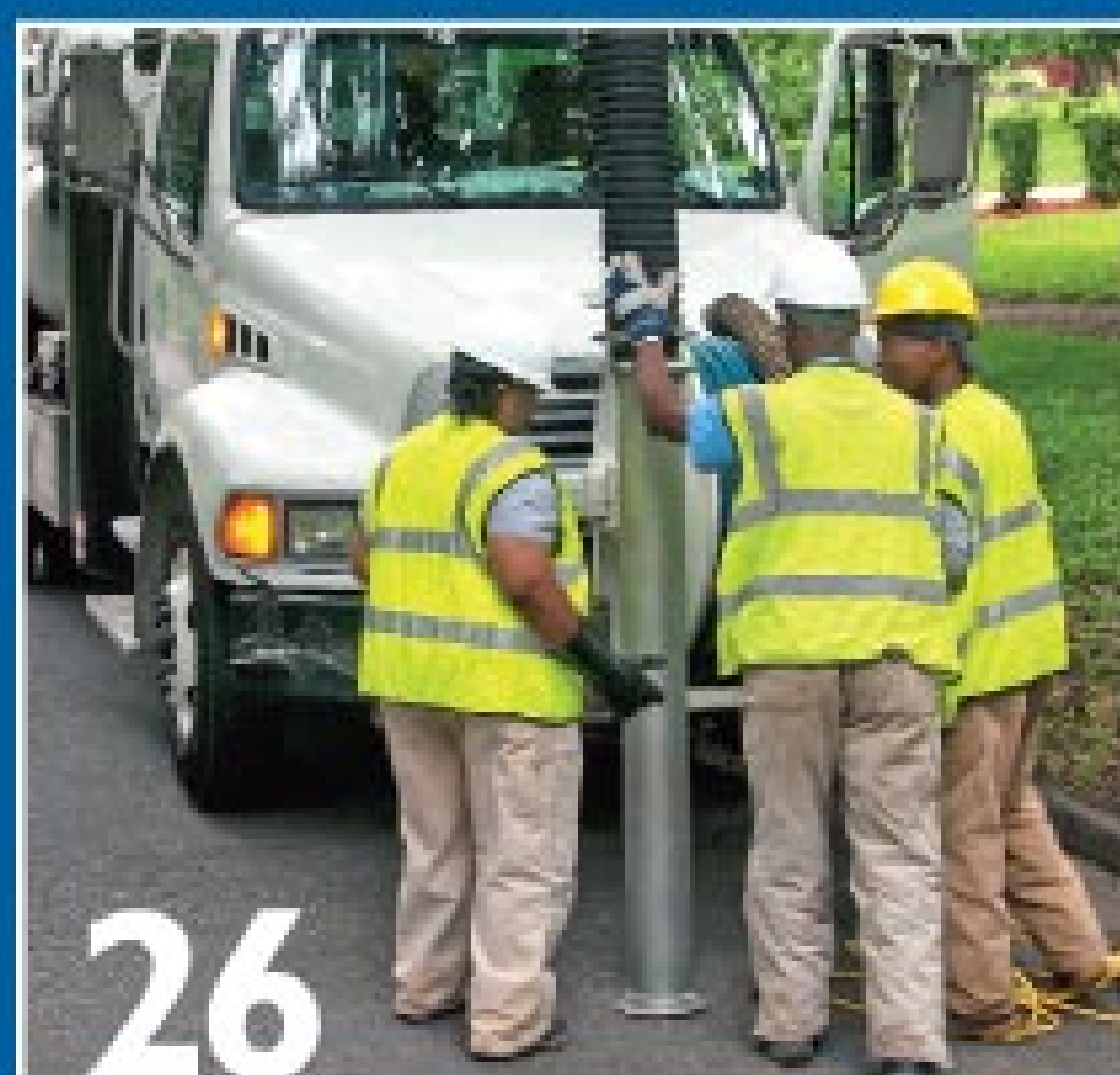
INSIDE:

FIELD AND OFFICE TECHNOLOGY



COVER:

Sam Smalley, assistant director of asset maintenance for the Detroit Water and Sewerage Department, has led a revival of the city's long-neglected underground infrastructure. Here, repair worker Juanita Oakes, mechanic Ronald Leapheart and repair worker Andre Badgett jet a sewer main using a Vactor truck. (Photography by Gerald Bernard)



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Special Issue: Water System Maintenance and Rehabilitation

- ◆ Water: Leak detection and metering in Kingsport, Tenn.
- ◆ Water: Leak detection and repair in Decatur, Ill.
- ◆ Storm: Public education programs in Oldham County, Ky.
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By Peter Kenter

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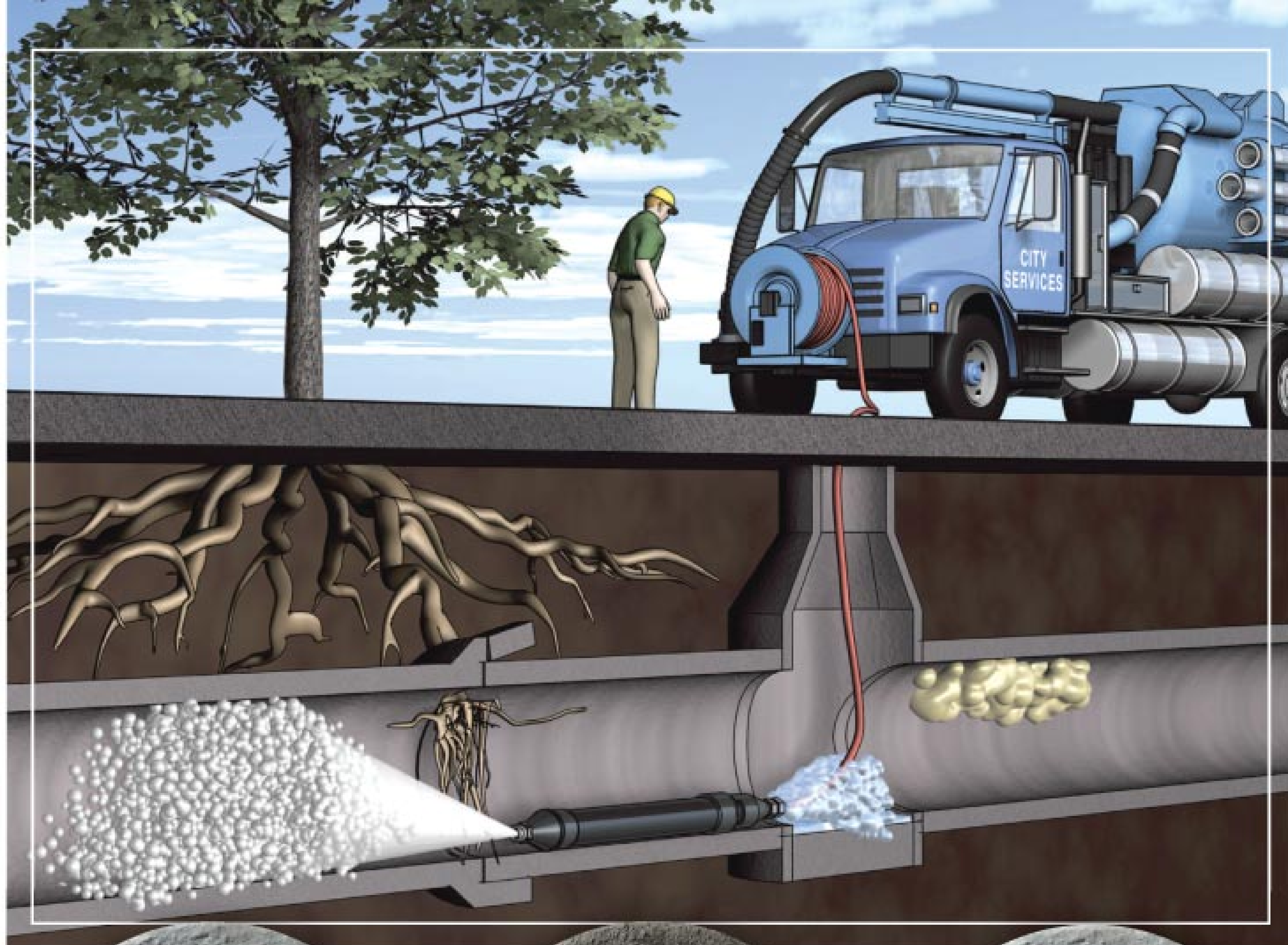
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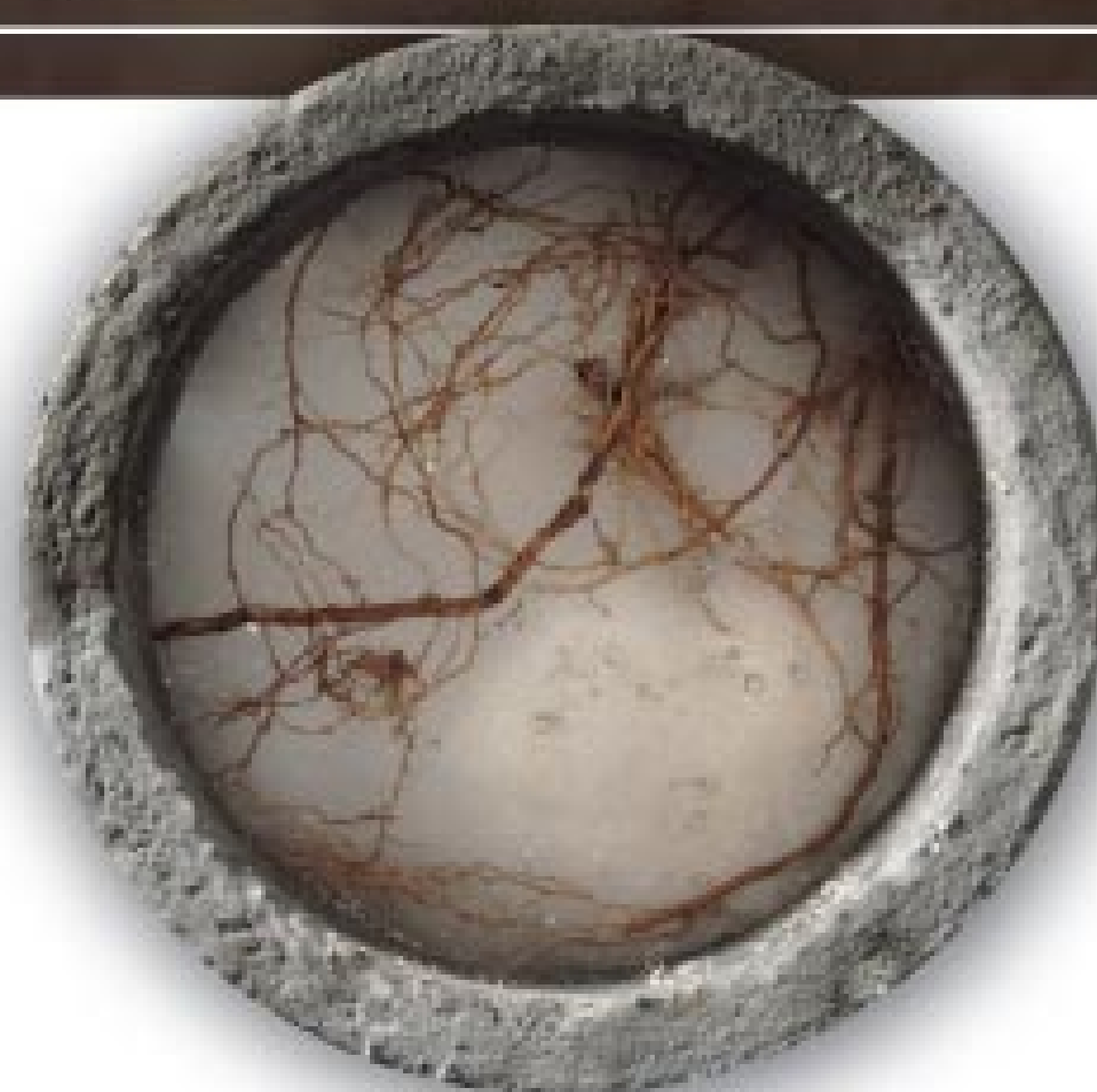
By Ed Wodalski

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Published monthly by:

 COLE publishing

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

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EDITORIAL CORRESPONDENCE: Send to Editor, Municipal Sewer & Water, P.O. Box 220, Three Lakes, WI 54562 or e-mail editor@mswmag.com.

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

CIRCULATION: 2009 average circulation was 36,282 copies per month (U.S. and international distribution).



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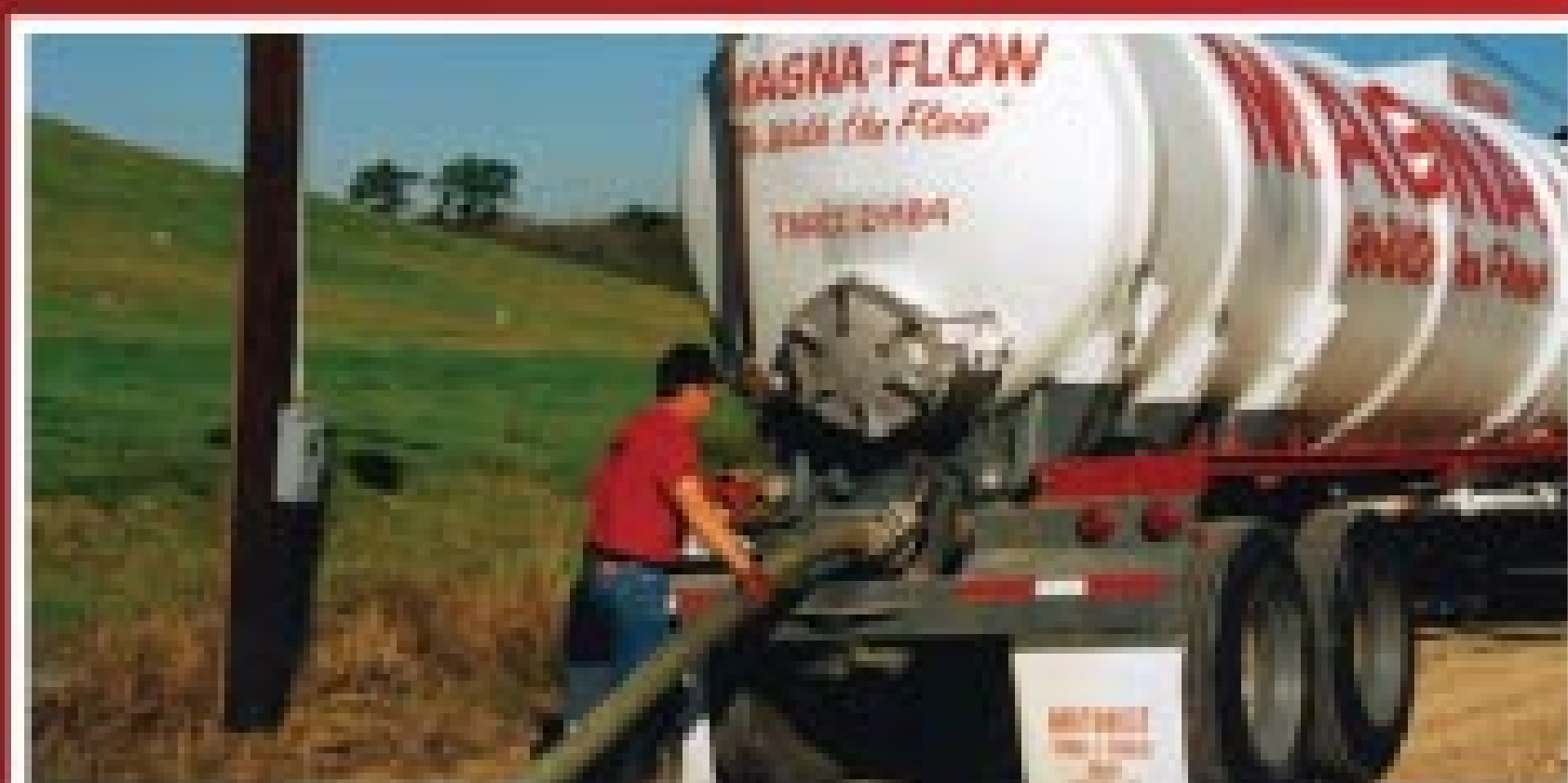


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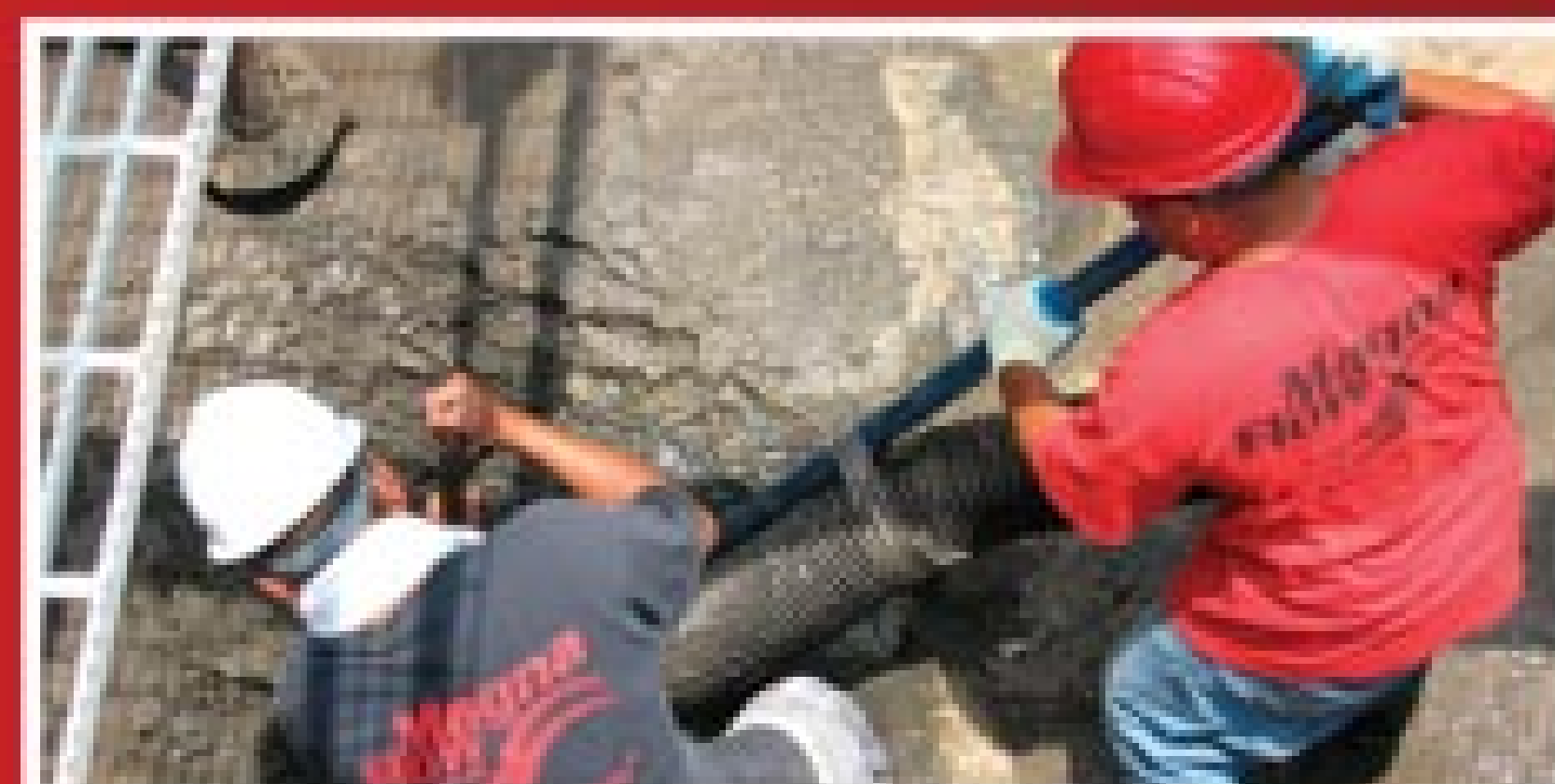
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THINKING ROI

So the budget is tight. That's all the more reason to make an investment to attend the top trade shows in the water and wastewater industry.

Iserved on a school board for a term some years back years. My district was one of the few that sent its entire seven-member board to the annual state school boards association convention.

My contribution to the journey was to suggest that each one of us come back to the first board meeting after the convention and report on three things we learned there that would help us cut costs or improve education. If nothing else, I thought, the exercise would bolster the decision to have all of us attend, versus just a representative or two.

It's amazing how much you pick up when you go to a convention or trade show with an assignment like that in your pocket.

Worth the trip

Why bring this up now? Because I remember seeing far fewer municipal managers than usual at last year's Pumper & Cleaner Environmental Expo, sponsored by COLE Publishing, the publisher of this magazine. I'm guessing that was at least in part because the recession had made budgets tighter than usual.

Perhaps cities, villages and utilities decided to stick to the shows focused solely on the public sector, like AWWA, WEFTEC and APWA. Or

maybe cost constraints kept a lot of managers away from those shows, too.

Whatever. The point is, you should go to your sectors top trade show, regardless what the budget looks like, and for a simple reason: The budget is only going to look worse if you miss out on seeing new ways to work more efficiently.

It doesn't take a lot of learning to more than make up for a show registration fee, a round-trip plane ticket, and a couple of days in a hotel. Not when these shows are loaded with instructional seminars and with exhibitors offering new and better technologies.

Stay-home syndrome

Am I biased toward our own Pumper & Cleaner Expo? Of course. It runs March 2-5 in Louisville, Ky. Early registration costs just \$40. But my larger point concerns trade shows in general.

For a variety of reasons, not all of them sound, the public sector is more sensitive to the private in responding to tough times. The mantra in city hall is that when budgets get tight, anything that looks extravagant gets cut. And traveling halfway across the country to a trade show, even if in Kentucky and Hawaii, can look extravagant.

But you should go anyway. Or at least ask, and in doing so make the case to your superiors for why. And the why is really fairly simple: Those who stop learning stand still, and those who stand still fall behind.

A good trade show is never an expense. If all a show did was cost money, why go? Trade shows in general would



FROM THE EDITOR

Ted J. Rulseh

be out of business if they only cost and didn't pay. Generally speaking, the best shows pay big.

Ask the right way

So the budget has been cut and travel and conferences are restricted. Ask anyway. You may get a "no," but you can't get a "yes" unless you ask. And ask the right way.

Don't just ask for \$1,000 or whatever it costs for the show registration and travel. Put the cost on one side of the ledger, and put the benefits on the other. Tell your superior that if you attend, you'll come back with an itemized list of

A good trade show is never an expense.

If all a show did was cost money, why go?

Trade shows in general would be out of business

if they only cost and didn't pay. Generally speaking, the best shows pay big.

10 things you learned that you can put to work immediately to help reduce energy costs, labor costs, vehicle costs, maintenance costs.

And a list of five more ideas that will improve customer service. And a list of five pieces of equipment that can save your department money — even if their actual purchase may have to wait a little while for better times. It might not work. But then again it could. And even if not, you'll at least be able to say, "I tried."

I hope to see you at the 2011 Pumper & Cleaner Expo.

♦ ♦ ♦

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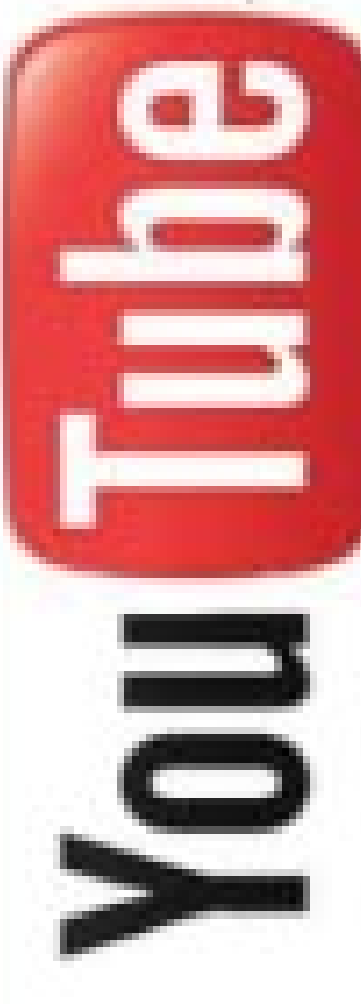


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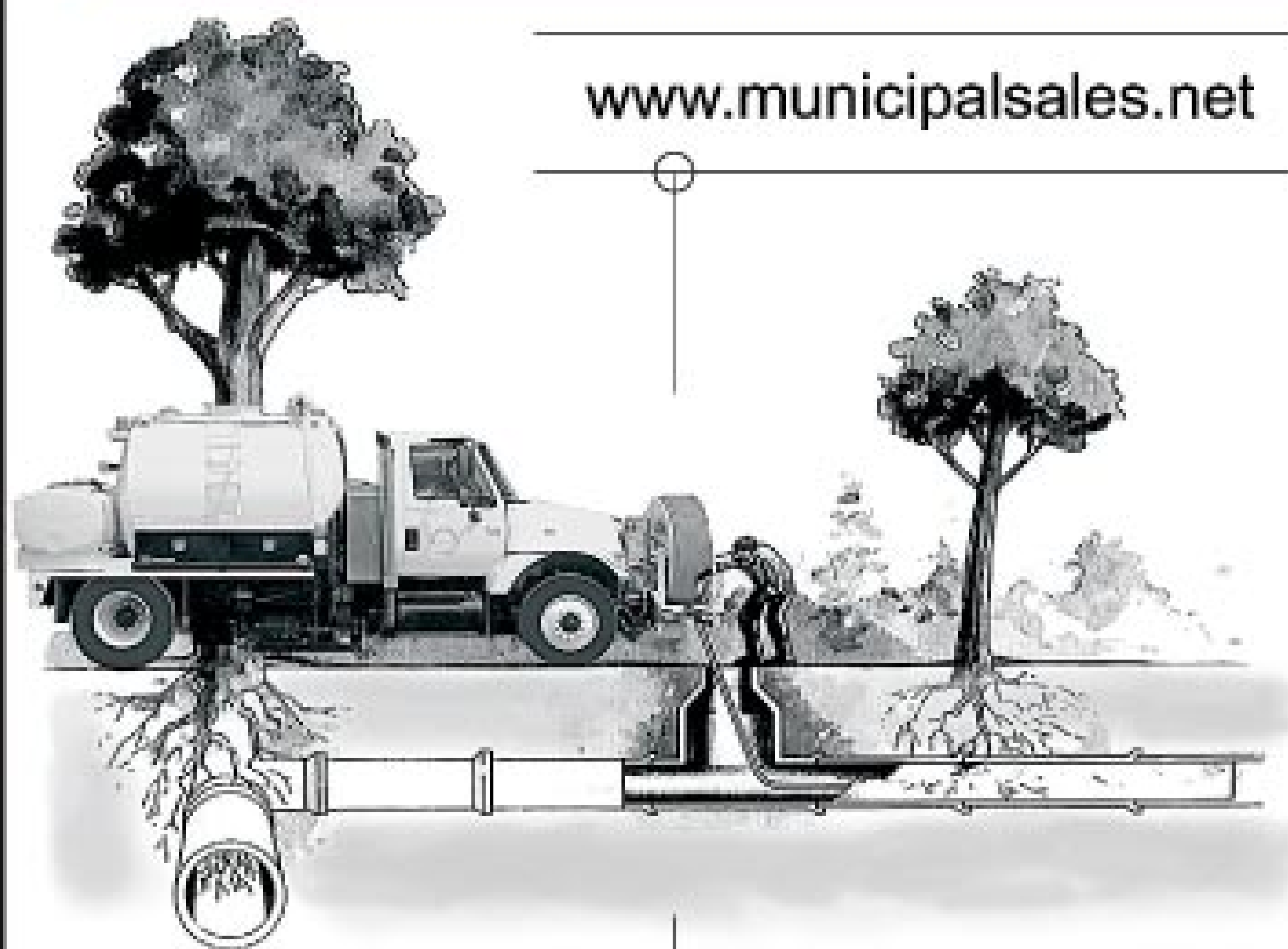
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LEAP OF FAITH

An in-house pipe bursting program provides a cost-effective solution for a California sewer authority's I&I reduction and capital replacement initiatives

By Suzan Marie Chin

“How will we know that your projections and expected benefits will play out?”

That's the question Brett Richards faced from the Ross Valley Sanitary District board of directors when he proposed an in-house pipe bursting program to rehabilitate the sewers.

With great confidence, Richards put together a pilot program built on trust in his staff's talent, his own extensive knowledge, and a local technology provider. His faith has proven justified with a rehabilitation program that is providing a long-range solution for

the district, in Marin County, Calif.

The district is replacing some 200 miles of aging sewer mains at a regular pace, saving almost 40 percent in costs per mile when compared with contracted pipe bursting service.

Wettest in the West

Ross Valley has one of the wettest climates on the West Coast. Average dry-weather flow to its wastewater treatment plant ranges from 4.8 to 5.6 mgd, but that spikes into 20 to 30 mgd during wet weather. The spikes are unusual for any collection system, so when Richards came on board as general manager of the district in

October 2008, he soon recognized that the system had a significant inflow and infiltration (I&I) issue.

The district includes the town of Larkspur, which has areas situated at or below sea level. A significant amount of the I&I was saltwater intrusion through pipelines in those areas. CCTV inspection and hydraulic modeling revealed what Richards suspected as a widespread problem, and he knew he needed a plan to replace or rehabilitate all 200 miles of the collection system.

In recruiting Richards, the board made it clear what his mission and primary objective should



PROFILE:

Ross Valley Sanitary District, Larkspur, Calif.

FOUNDED:
1899

POPULATION SERVED:
59,000

EMPLOYEES:
32

INFRASTRUCTURE:
200 miles of sewer mains,
20 pumping stations

ANNUAL BUDGET:
\$28 million

WEB SITE:
www.rvsd.org



Ross Valley Sanitary District program coordinator and assistant engineer Dennis Gavallos (left) works with the support of TRIC Tools' John Rafferty to attach a bursting head and cable to a 350-foot length of HDPE main pipe. (Photos courtesy of David Wren)



District maintenance employees Fred Guerrero and Albert Coats and John Rafferty of TRIC Tools (in pit) position the TRIC M50 puller, designed to burst up to a 10-inch main with 50 tons of pulling capacity.

be. "The directive I received was, 'We want to be the front runner, a premier sewer organization. We want to solve our problems before they become problems,'" Richards recalls. "I knew after I had been here just a short time and saw the influx of I&I that pipe bursting would be a good solution and an excellent place to start combating the problem."

Contract or in-house

Looking around, Richards saw potential to solve a number of problems by drawing upon the talent and experience of his own staff. The majority of the crew had been with the district for at least seven to 10 years and had extensive experience in excavation, pipeline repair, and manhole and lateral replacement. That provided a head start in creating a successful program.

Before approaching the board, Richards conducted a financial and feasibility analysis. "Any time you're talking about adding staff and equipment, the questions that come up are what are the long-term benefits, salaries, retirement, and so forth," he says. "As a manager doing the analysis, you have to ask yourself: How long will it take our program to be completed? How many miles of pipe can we realistically complete over a stated period?"

"If your realistic ability to solve your problem completely is anything longer than 30 years, then you've got issues that are not going to be solved in a timely or cost-effective way unless you take dramatic action like bringing staff in-house."

That's how Richard built his case. To achieve the goal of replacing the entire system, at a feasible

SHARING THE BURDEN

Ross Valley Sanitary District was well aware of its significant I&I issues. Although much of the problem was caused by aging infrastructure, studies confirmed that a large share of the problem came from some 200 miles of private laterals throughout the region.

A local group, the North Bay Watershed Association, had been discussing a lateral ordinance and repair program for residents for several years, but the process seemed caught in "paralysis by analysis."

In 2009, the district performed a study of its lateral ordinance, rewrote it, and launched a lateral grant program, setting aside \$250,000 for the first year. A customer who experiences a sewer issue must request a service call from one of several dozen contractors approved by the district. Then the customer must submit a grant application form along with a CCTV inspection and a copy of the invoice for the initial investigative service call, detailing all work performed.

The district staff reviews the video, and if the findings meet the criteria for a repair, the district approves the grant and puts the project into the queue. The property owner then has until the end of the fiscal year to hire an approved contractor to perform the work.

The grant allows for up to \$4,000 or half of the lateral repair cost, whichever is less. Within eight months of inception, the district accepted about 75 applications and disbursed \$248,000 in grants. Because of its success, the district will continue the program and plans to increase the amount of grant funds available.



Albert Coats fuses 20-foot sections of new pipe with a McElroy pipe fusion machine to create a 350-foot length of replacement main.

rate of five miles per year, the program would run 40 years, meeting Richards' criteria for an in-house operation.

In addition, the district had a history with pipe bursting for its existing capital replacement program and could document the cost of doing the work with outside contractors and consultants. The average was about \$1.4 mil-

lion dollars per mile. Richards calculated that he could outfit a crew, with salaries, benefits, supplies, equipment, maintenance and retirement plans, for less than \$800,000 per mile.

"When we plugged the data points into the analysis, it became obvious that it was in our best interests to bring in-house staff," Richards says. Armed with the



Dennis Gavallos operates the pipe fusion machine.

facts, he approached his board with the concept of an in-house bursting crew. The work began with an 18-month pilot program that would enable the crew to go through two full seasons.

Within just a few months from the program's inception in June 2010, the district is achieving productivity numbers not expected to be reached until at least a year into the program.

Distinct advantages

Richard cautions that not every agency should expect the same results. He credits the district's fast track to success to the depth of experience of his crew, notably crew leader Dennis Gavallos, and to the support of TRIC Tools, the pipe bursting technology provider.

Because the crews had experience with the preparatory work that goes with pipe bursting — trenching, excavating, locating and site inspection — they only had to come up to speed on the actual bursting process.

"I can't overemphasize TRIC Tools' assistance and its impact on our success," says Richards. "They were an open book. They assessed our needs and have been with us every step of the way." TRIC assisted with factory and field hands-on training for all facets of the bursting technology and process, including physical assistance with actual projects.

Pipe bursting involves numerous steps. Before bursting can begin, the line to be replaced is inspected, laterals are located, and any sags in the line that need to be repaired are pinpointed. If a



Brett Richards, RVSD general manager.

sag is not too extreme, the quality of the new pipe usually enables the crew to burst through without changing the alignment.

Small excavation pits are created at the entry point for the new pipe and at the exit connection point. Small lateral connection potholes are also dug. Once the prep work is complete, the crews determine the direction of pull. If possible, they pull uphill, as that makes it easier to lubricate the bursting head and pipe during the pull. Once the direction is established, a pulling cable is inserted through the pipe and is attached to the hydraulic cable pulling device.

The new sections of HDPE pipe are then fused with a "hot pad" device that monitors temperature and fusing angle. The entire length of pipe is then attached to the bursting head and pulled into place. Once the main pipe is installed, crews also burst the lower lateral connection portions, creating a completely new infrastructure.

Using a saddle connector, they connect the new pipe to the property owner's portion of the lateral, and the reinstatement hole is cut.



The bursting head followed by the new HDPE pipe enters the old clay main as a pipe burst begins.

"It becomes economy of scale for us. Between the manholes and getting as many homeowners on board with lateral replacement as possible, our goal is to leave behind a section of the system that is 100 percent new."

Brett Richards

A two-way cleanout between the new lower lateral and the property owner's lateral is installed to give the district multiple angles from multiple locations to service the line in the future.

While in the area ...

In 2009, the district started an innovative Lateral Replacement Grant program for homeowners that saw overwhelming success in its maiden year (see sidebar).

When a main is scheduled for bursting, the district does aggressive outreach in the neighborhood to let residents know they have an excellent opportunity to have their own laterals inspected by a certified contractor and that, if they qualify, they can receive grant funds to have their laterals

replaced during the mainline replacement project.

If manholes connected with a bursting project need to be rehabilitated, Richards often opts to simply replace them at the same time. "Since we're digging a pit in the location anyway and the crews are going to be on site for several weeks, it makes much more sense to dig out the old manhole and put in a new one versus attempt an intermediate restoration," he says.

"It becomes economy of scale for us. Between the manholes and getting as many homeowners on board with lateral replacement as possible, our goal is to leave behind a section of the system that is 100 percent new."

No magic bullet

For Ross Valley, an in-house bursting program has proven to be an excellent fit, but Richards cautions that it may not be the magic bullet for every agency. He believes the keys to his district's success have been genuine desire on the part of the board and staff to solve the problem, and willingness to be honest and candid with each other.

"As a manager, you need to do some serious thinking about whether you have the ability right here and now in-house to do the work," Richards says. "If not, you are at a distinct disadvantage. It would be very unusual that even the most progressive agency would fully fund the permanent hiring of an entire new crew with a demonstrated track record."

An agency considering a similar program must evaluate its system, in particular the total scope of the project. "Do your due diligence," Richards advises. "If the numbers work, then take that leap of faith in yourself and your team. For us, it has been an excellent step for taking the district to the next level in system efficiency and performance." ♦

MORE INFO:

McElroy Manufacturing Inc.
918/836-8611
www.mcelroy.com

TRIC Tools Inc.
888/883-8742
www.trictools.com



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YOU DON'T WANT TO MISS THIS

The exhibit floor and Saturday Evening Jam at the 2010 Pumper & Cleaner Expo.

The 2011 Pumper & Cleaner Environmental Expo includes more new products, exhibits, more learning, more networking, and a blockbuster show at the Saturday Evening Jam

By Ted J. Rulseh

Eighty percent of attendees surveyed at the last Pumper & Cleaner Expo said they would come back in 2011.

That says a lot about the 2010 show, and the 31st Annual Expo March 2-5 in Louisville promises to be even bigger and better. More than 500 exhibitors are expected. There will be a record number of educational seminars. The new-product display space will double. A special Saturday morning Roundtable pancake breakfast will give industry professionals a chance to network and discuss key issues and concerns.

And, to top it all off, the annual Saturday Evening Jam features Dierks Bentley, nominee for 2010 Country Music Association Male Vocalist of the Year and Album of the Year (for *Up on the Ridge*).

"In every respect we continue to make the Expo a bigger and better event for our attendees and exhibitors," says Julie Gensler, Expo coordinator for show sponsor COLE Publishing. "We want professionals in our industry to get more for their investment — in business value and pure enjoyment — every time they attend."

More products and technologies

Tools and equipment remain a key Expo attraction: some 79 percent of 2010 visitors said that new products and technologies were their main reason for attending.

Interest from exhibitors for 2011 is running high. After the 2010 Expo, 85 percent of the 492 exhibitors already said they were planning to be back. Since then, a number of new companies have expressed interest in floor space. The total number of exhibits will most likely exceed 500.

In addition, the popular new-product display, which included 16 companies last year, is moving to larger quarters, and more than 30 exhibits are expected. In these unmanned displays, open throughout the exhibit hours, visitors can examine the products, watch loop videos, and scan their badges to request more information.

More skills and knowledge

The ever-expanding education lineup includes 85 seminars spread across three days. The Education Day program, on Wednesday, March 2,

includes tracks of seminars presented by:

- Leaders Resource Network
- Southern Section Collection Systems Committee
- National Association of Sewer Service Companies
- National Environmental Health Association
- National Onsite Wastewater Recycling Association
- WaterJet Technology Association
- Portable Sanitation Association International
- Safety Management Systems
- National Association of Wastewater Transporters

Another track will feature motivational speaker and business coach Scott Hunter, speaking on leadership and "Creating an Outrageously Successful Organization."

The Thursday and Friday morning programs (March 3 and 4) include six seminars in Spanish to serve the growing number of Expo visitors from Mexico, Central America, and South America. All day Thursday, Jim Anderson and Dave Gustafson of the University of Minnesota onsite program

will present an installer seminar.

Many seminars qualify for state-approved continuing education credits.

Another way to network

The show hall, dining area, lobby, shuttle buses, and Louisville nightspots remain as venues for networking, along with the

send me an e-mail to julieg@colepublishing.com. We will seriously consider all ideas and will choose the topics of greatest interest to our industry members."

The breakfast price is \$10 and includes fresh fruit salad, butter-milk and blueberry pancakes, link sausage, maple syrup and butter, orange juice and coffee.

"Each year we try to make the Expo the most rewarding and most fun few days in our attendees' business year. We look forward to seeing old friends again and to meeting many new business owners and municipal managers who want to sharpen their skills and learn better ways to serve their customers."

Bob Kendall

COLE Pub outside the show hall. But this year there's a new opportunity. A Roundtable Discussion and Pancake Breakfast runs from 8 to 10 a.m. Saturday. Here, in a forum moderated by COLE Publishing staff, attendees will share ideas on industry "hot topics."

"We're still developing the list of topics," says Gensler. "Attendees who want to suggest a topic may

Good times for all

As always, the Expo offers lots of enjoyment. The Roe-D-Hoe, sponsored by the National Onsite Wastewater Recycling Association, will be back after a successful first year. More than a spectator event, it lets equipment operators practice their skills in a series of timed events requiring a combination of speed, precision and finesse.

The annual Thursday evening Industry Appreciation Party once again offers 25-cent tap beers.

Dierks Bentley, headliner for the Saturday Evening Jam, is the highest-profile act ever to appear at the Expo. Just reaching the height of popularity, he has been a big draw at his own concerts and at country music festivals around the country. Find out more about him at www.dierksbentley.com.

The concert will be held in Freedom Hall, connected directly to the Kentucky Exposition Center, so that attendees can walk to the show while staying indoors. Twenty-five-cent tap beers will be served before the concert.

"Visitors to the 2011 Expo are in for a treat," says Bob Kendall, owner of COLE Publishing. "Each year we try to make the Expo the most rewarding and most fun few days in our attendees' business year. We look forward to seeing old friends again and to meeting many new business owners and municipal managers who want to sharpen their skills and learn better ways to serve their customers." ♦

BUSINESSES FOR SALE

Chicago-Area Biosolids, Land Application, Dredging and Industrial Services Business. Established in 1985, owner is retiring. Reputable business includes real estate servicing the entire Chicagoland area with sludge and biosolids disposal and treatment services. Real estate and shop included with sale valued at \$750,000, business grosses in excess of \$3 million annually, \$6.3 million in equipment and assets including several TerraGators, Vac Trailers, dump trailers, loaders and much more. **\$4,900,000.** Huge potential, good profit and priced right. Non-Disclosure Agreement required, all P&L statements, list of assets, and financials available to qualified buyers.

WANTED. Very serious and well qualified buyer looking for sewer, septic or industrial business in Dallas, Texas area. Must be grossing between \$500,000-\$1,000,000. All inquiries are kept confidential.

Green Bay, Wisconsin Area Septic & Drain Business. Solid and steady revenue history and nearly 20 years established. Excellent opportunity to expand or start your own business. Includes very well-maintained 3,800 gallon septic service truck, fully outfitted 2002 Chevy drain service van, drain & sewer equipment, all office equipment and computers, 2,700+ customer list, and more - a true turn-key or easy expansion opportunity. Very meticulously maintained equipment all kept inside a heated shop. Current owner is retiring. Large shop and real estate is also available if desired at additional cost. **Asking \$249,000.**

Successful business with a large amount of equipment and inventory. Profitable sewer and septic business in central Pennsylvania. Increasing revenue over the past 3 years and a large amount of equipment and inventory. Equipment is a mix of old and new, but all is working and making money. **Selling price \$349,000.**

Dallas/Fort Worth Texas Area Sewer/Rehab Business For Sale. Drain Cleaning, TV inspection, Pipeline & Manhole Rehab/Relining, Municipal Cleaning and Maintenance business for sale. Excellent opportunity to expand or start your own business. Good revenue history and priced to sell. Includes all equipment to get started. **Asking \$150,000.**

Well-Established and Profitable Texas Septic, Sewer & Installation Business For Sale. Price reduced. Grossing in excess of \$600,000 annually, customer list of nearly 2,000 accounts and 430 contracted customers. Includes nice late model equipment, most are 2007, 2008 model years. Owner retiring after nearly 40 years in business. Real estate available upon request. **Reduced to \$450,000.**

Established portable restroom and septic service business located in central Virginia. Excellent gross each of the past 3 years with no decline in revenue makes this business recession-proof. Steady work including many contracts and repeat customers. Extensive equipment inventory, good revenue, and owner willing to train. Great opportunity for expansion or a new career. **Asking price \$775,000.**

New Jersey VIP Restroom/ Portable Toilet Business. Servicing Metro Philadelphia and Southwest New Jersey with VIP restroom trailers and portables. Many late model assets including 2 nice service trucks, 1 back-up service truck, pick-up truck, 4 VIP restroom trailers, nearly 300 restrooms, sinks, holding tanks, slide-in unit, 2 forklifts, and more. Assets worth over \$300,000 - priced to sell at **\$399,000.**

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FOCUS: SEWER

DAILY PROGRESS

Daly City, Calif., pursues a rigorous schedule of sewer televising and repair, backed by a technological edge that is one part software, one part hardware

By Peter Kenter

When Bob Donati started working for the Department of Water and Wastewater Resources in Daly City, Calif., 23 years ago, sewer cameras were in their infancy and most software could fit onto a double-density 3.5-inch floppy disk.

Now, in 2010, the city is keeping two steps ahead of clean-water regulations with an ambitious 10-year plan to scan, maintain and expand its sewer system. Crews use side-scanning camera technology, inspection reporting software, and GIS data systems.

With that setup, the department is embarking on its plan to scan, repair and rehabilitate the sewer lines under its jurisdiction. Capacity in some lines will also have to increase to reflect current usage.

The schedule includes 60,000 feet of inspection and repair per year for Daly City, plus 15,000 feet per year in other community systems for which Daly City is responsible. That schedule depends on the availability of staff and the TV truck, which is still used for inspecting new construction and previously scheduled pipe rehabilitation.

Birth by earthquake

Officially named the City of Daly City, this community of about 104,000 was founded in 1911 by citizens displaced by the San Francisco earthquake of 1906. The refugees settled on a ranch just south of Frisco on the Pacific Ocean. It was owned by John Daly, who subdivided his estate into housing tracts. Some of the city's sewer lines date back to that time, and a

second round of lines was built a half-century ago.

The city lies in San Mateo County, but the Water and Wastewater Department's service area is geographically complex. It includes the North San Mateo County Sanitation District, a subsidiary of Daly City, covering the largest part of the community.

It also covers the city of South San Francisco, primarily the Westborough district, and unincorporated communities in San Mateo County, including the towns of

PROFILE:

Department of Water and Wastewater Resources,
Daly City, Calif.

INCORPORATED:
1911

POPULATION:
104,000

AREA SERVED:
7.5 square miles

EMPLOYEES:
74

INFRASTRUCTURE:
North San Mateo County Sanitation District, 220 miles of sanitary sewer lines, including Daly City, 180 miles

ANNUAL BUDGET:
\$13.7 million water, \$14.4 million North San Mateo County Sanitation District

WEB SITE:
www.dalycity.org



Collection system maintenance worker I Daniel Pray lowers the Envirosight camera into the manhole for inspection as collection system maintenance worker II Mike Patolo looks on. (Photography by Keith Dixon)

Broadmoor and Colma. Wastewater from the area is treated and then released to the Pacific Ocean through a three-quarter-mile outfall pipe (see sidebar).

Donati started with the department as a mechanic's helper and

Collection system field supervisor Bob Donati, left, with collection and distribution manager Tom Piccolotti.



worked up to collection system field supervisor. "I had worked as a maintenance worker in a television truck back when they were still towing the camera through the lines," he says. "When the Loma Prieta earthquake occurred in 1989, I was sent to Oakland with the tractor and a pan-and-tilt camera to search for survivors in the debris of the collapsed freeway."

Master plan completed

A lot has changed since then. The city completed a sanitary sewer master plan in 2009, contracting with RMC Water and Environment to map the location and capacity of the lines. At the same time, the department was seeking a replacement sewer camera.

"The old one was a pan-and-tilt tractor model that was pushing eight or nine years old," says Donati. "It was costing a lot of money to keep it going, and we were having trouble getting accurate marking locates with the locator."

While some municipalities have adopted laser profiling, Donati says that technology would have limited use in Daly City's system.

"The lines are more than 90 percent vitreous clay pipe," he says. "With clay, we don't really need a reading on whether the pipe is true to size or experiencing deflection. And when laser profilers find cracks, it's impossible to distinguish between a hairline and a severe crack."

"After 185 miles of laser profiling of clay pipe, you would query the system and get a list of cracks, but no indication as to the severity, or which lines require the most immediate attention."

Side-scanning technology

The department instead chose to remodel the inside of the van and purchase a new camera unit:

THE FINAL ASSIGNMENT

It's a scene typical of movies about big-city police departments. A veteran cop, about a week from retirement, is called into the chief's office for one last assignment, which turns out to be the toughest case of his career.

"That's the way it was for me," says Bob Donati, whose last big job as collection system field supervisor with Daly City involved repairing an outfall pipe that emptied into the Pacific Ocean.

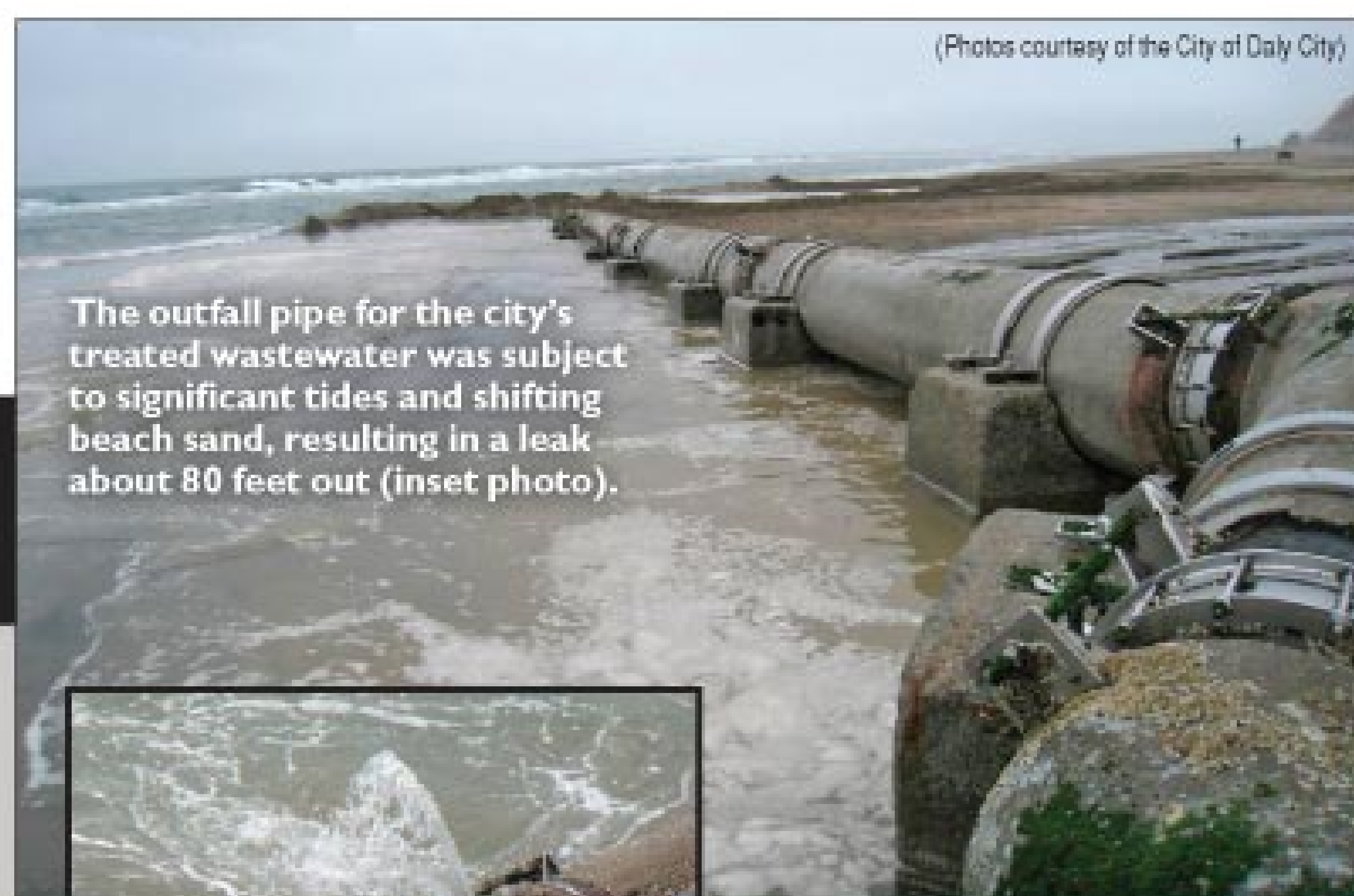
"My boss, Tom Piccolotti, was sitting at his desk with a mean cup of coffee and a jelly doughnut and told me there was a hole punched in the outfall pipe for the city's treated wastewater — and that pipe goes out three-quarters of a mile into one of the roughest stretches of ocean on the West coast," Donati recalls.

The steel pipe had developed a hole about 80 feet out, potentially allowing treated water to escape into the Pacific short of the end of the pipe. The cause? Probably a combination of the corrosive action of shifting sand and constant exposure to seawater.

"We temporarily stopped the leak with a redwood plug, but we needed a permanent fix," says Donati. "But that stretch of ocean is so rough that the sand around the pipe is constantly shifting. The outfall pipe is surrounded by concrete lined with mortar and measures about 32 inches in diameter."

Adding to the challenges of vigorous tides, the approach to the outfall is a steep, sandy slope, and the beachfront is part of the Golden Gate National Recreation Area. The project required approval from the National Park Service, the California Coastal Commission, and the California Department of Fish and Game.

"We had a two-and-a-half to three-hour window for construction," says Donati. "We were there at 3 a.m. on the bluff about 165 feet above the work site, waiting for the construction window to open. We had previously fused three 50-foot sections of 32-inch HDPE slip liner using high-heat plate, then



(Photos courtesy of the City of Daly City)

The outfall pipe for the city's treated wastewater was subject to significant tides and shifting beach sand, resulting in a leak about 80 feet out (inset photo).

cut the section down to 117 feet. Each of the 50-foot sections weighed about 4,000 pounds."

The job involved collection crew workers, a grouting crew, a backhoe, a bulldozer, and a generator, led by a wildlife biologist, who ensured that two local bird species, the bank swallow and the snowy plover, remained undisturbed.

"The bulldozer was going down the hill backwards to act as a brake for the excavator and other equipment that followed it," says Donati. "I was wearing a wetsuit with a hardhat and flashlight on my head. It looked more like a military assault than a construction project."

The slip liner was carried to a concrete structure box, and the Y-connection that joined both gravity-fed and pump lines was removed to allow a clear path to the outfall pipe. "We inserted the slip liner, then had a worker enter the pipe to pack grout around the annular space between the slip liner and the host pipe at the ocean end," says Donati. Grout was then injected into the remaining annular space at strategic points.

"We didn't have enough time to repair mortar joints with mortar," says Donati. "Wherever the metal was exposed to seawater, we used Syntho-Glass (Neptune Research Inc.), a woven fiberglass cloth impregnated with resin and activated by water, as a protectant. It sets up quickly."

The entire job was finished by 11 a.m. "Just in time for coffee," says Donati. "Tom had already eaten his doughnut."

The Daly City collection system team includes, from left, Hassan Shah, collection system maintenance worker I; Daniel Pray, collection system maintenance worker I; Patrick Sumner, collection system maintenance worker II; Mark Pappas, collection system field supervisor; Bob Donati, collection system field supervisor; David McNicoll, collection system maintenance worker I; Kevin McCarthy, collection system field supervisor; and Mike Patolo, collection system maintenance worker II.

the DigiSewer camera with ROVER crawler from EnviroSight. The unit promises to capture side-scanning footage at up to 70 feet per minute. For Donati's crew, that translates into about 7,500 actual feet per day.

The camera provides a conventional CCTV feed through one lens and 360-degree snapshots three seconds apart through a special fish-eye lens to provide sidewall scanning. Once the images are processed, operators can perform virtual pan-and-tilt maneuvers long after the scan has been completed.

Bob Donati demonstrates how he uses a locator to track a camera underground.



"The camera can handle anything from 6-inch lines to 64 inches," Donati says. "Offering us sidewall scanning and virtual pan-and-tilt along with CCTV combined the best of both technologies. Sometimes if we have protruding laterals or the flow is too high up in the line and we can't do effective sidewall scanning, we switch to virtual pan-and-tilt. That even allows us to zero in on the lateral, look inside and zoom up.

The unit also offers inclination graphing and integrates fully with WinCan 8 pipe inspection survey reporting software, which logs digital video, still images and text data in an extensive, searchable database.

Using Pipeline Assessment and Certification Program (PACP) defect coding, WinCan allows opera-



The EnviroSight camera positioned in the pipe and ready to begin an inspection.

tors to customize the scanning report, placing color markers on the scan image to highlight the locations of joints, service connections, cracks or any specific feature or defect recognized by the camera.

"Our department was one of the first in the state to adopt the

use of computers in the early 1980s," says Donati. "WinCan 8 is a nice addition to our software resources. The fact that software support was included with the purchase of the camera helped to seal the deal."

Recording GIS data

As the televising van gathers information, the DigiSewer unit provides the software with GIS information, marking areas requiring immediate attention. Work crews drop underground service alert markers over the critical areas and send a message to home base, calling for immediate repair.

"The more you televise, the more issues you find," says Donati. "It's a balancing act. As a full-service unit, we have to balance scanning with the work that needs to be done." The department uses in-house crews for all repairs, including pipe bursting on 8- to 12-inch lines. Many repairs are open-cut



Daniel Pray uses joystick controls to maneuver the camera inside a pipe.

“The lines are more than 90 percent vitreous clay pipe. With clay, we don’t really need a reading on whether the pipe is true to size or experiencing deflection.”

Bob Donati

because the sewers lie close to the surface.

An atypical tough job handled fully by the in-house crews was the replacement of a 700-foot section of sewer along the city’s Parkview Avenue in 2009. “We were doubling the diameter of the line, but we had to deal with 34 utility crossings over the length of the pipe,” says Donati. “Much of the job was open-cut-and-replace — only one section was suitable for pipe bursting, because it had a small number of lateral connections. We handled it from start to finish, and I was really proud of the crew.”

Root problems are consistent with those of other municipalities. For San Mateo County, the culprits are redwood, eucalyptus, cypress

and pine. “We have a rodder truck to deal with the roots, but if there’s damage, we perform repairs with Perma-Liner cured-in-place liner,” says Donati. The department has also contracted Duke’s Root Control to perform routine treatment with foaming herbicide.

Grease is an issue, as well. When workers spot a grease blockage, they clear the clog, and department personnel contact the business suspected of causing the problem. “It’s a source-control interceptor program,” says Donati. “We educate the source business on best management practices, then return in two to three months to see if there has been an improvement to the amount of grease coming through the service connection.”

The department is also in the middle of an extensive manhole rehabilitation program. “We pressure-wash the manholes, which are often corroded due to the effects of hydrogen sulfide,” says Donati. “We then use a rehab product from Epoxytec to give structural strength back to the manhole.”

Donati retired from the department in October, but the 10-year

scan-and-repair plan continues. “We’ll miss Bob, but work continues,” says his former boss, collection and distribution manager

Tom Piccolotti. “We’ll be looking back at a significant improvement to the sewer system from 2020.” ♦

MORE INFO:

Duke’s Root Control Inc.
800/447-6687
www.dukes.com

Envirosight LLC
866/936-8476
www.envirosight.com

Epoxytec
877/463-7699
www.epoxytec.com

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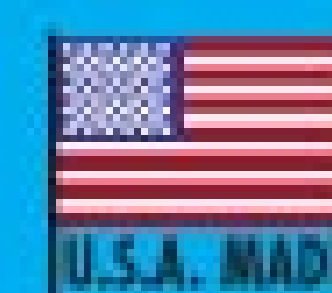


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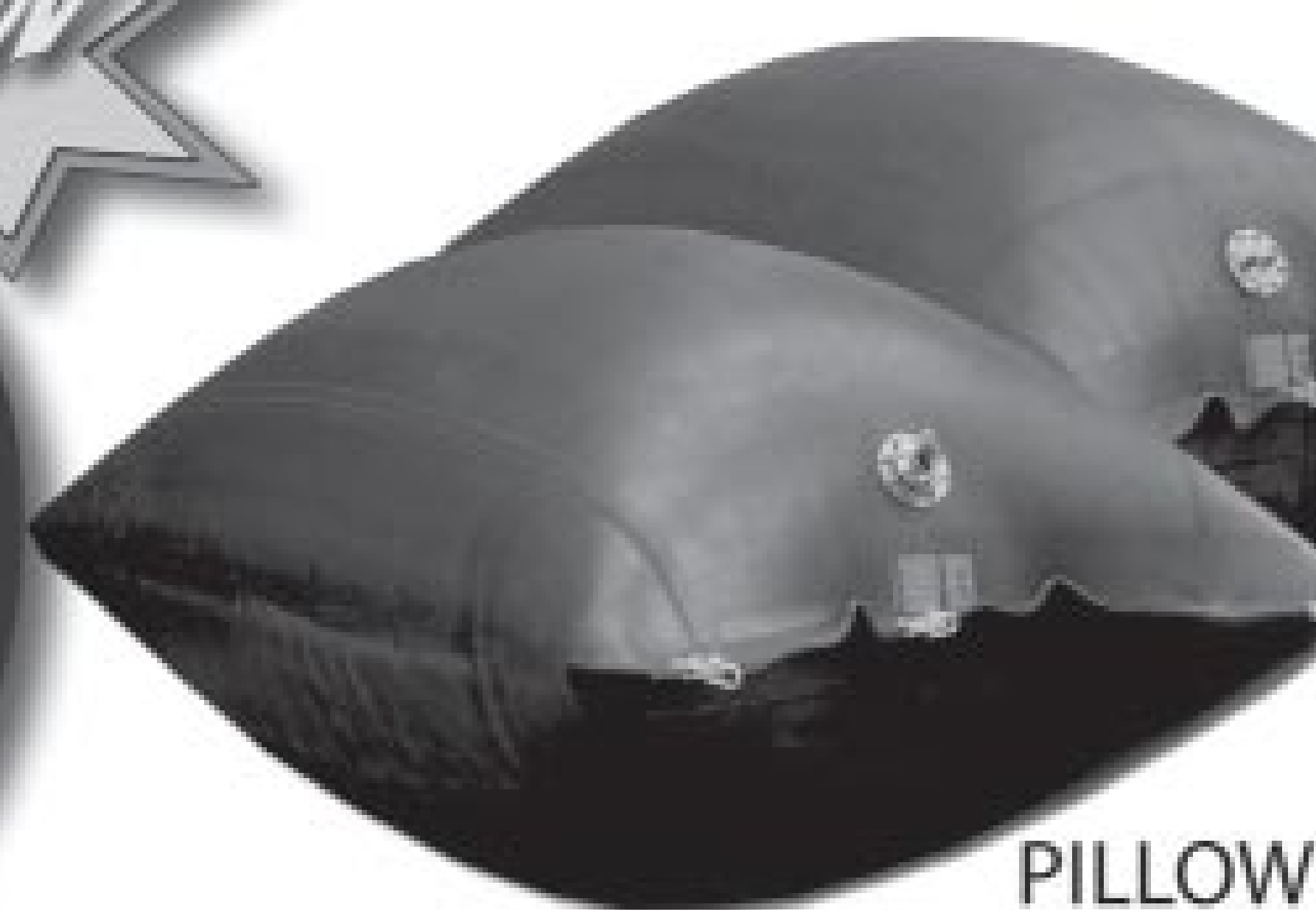


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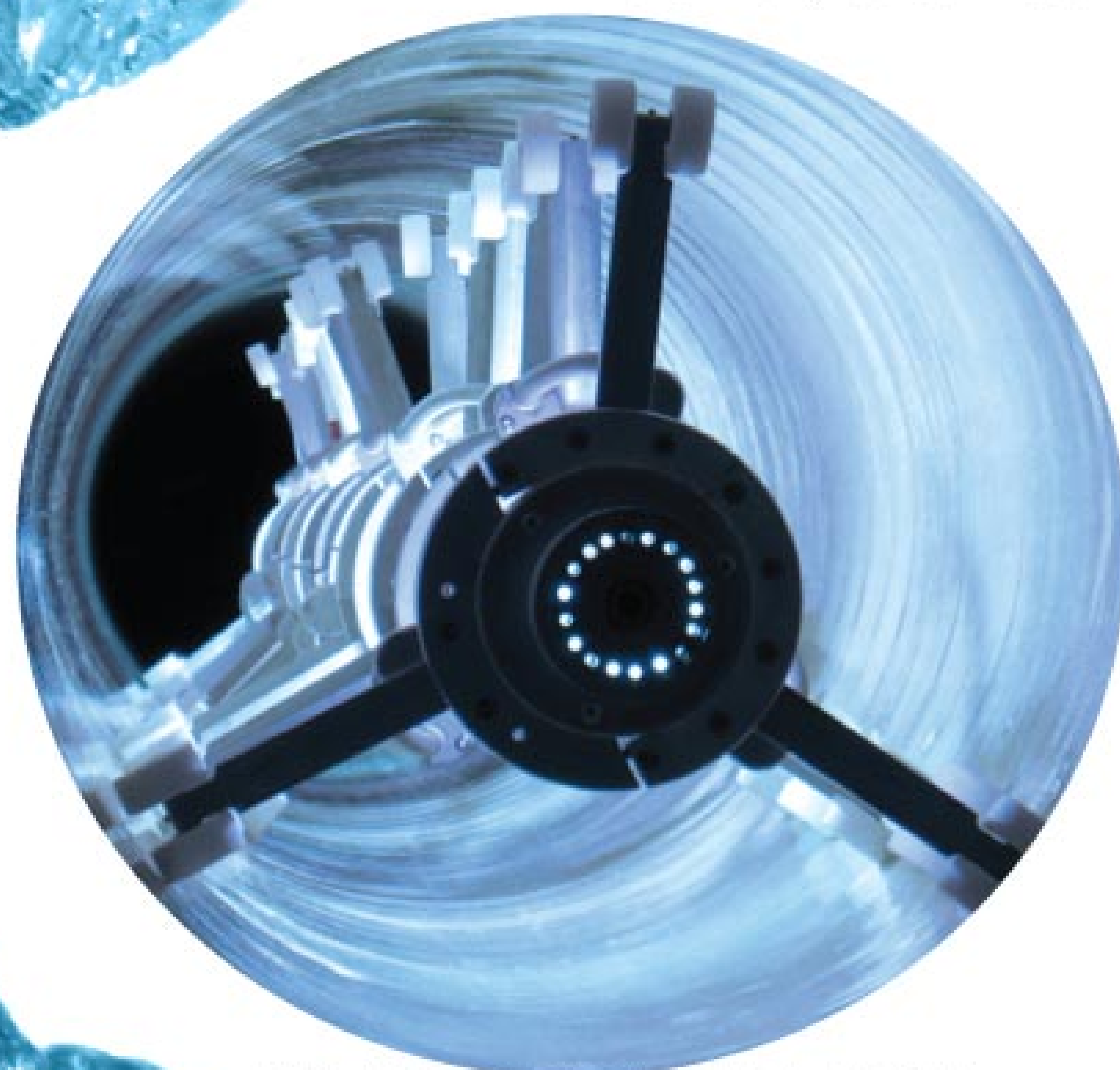


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MOTOR CITY RENAISSANCE

Challenged by rising costs, a declining population, and declining water sales, the City of Detroit has made great strides to improve its sewer and water systems

By Peter Kenter

Hammered by declining water sales, a declining population, fewer personnel, a shrinking industrial base, deteriorating infrastructure and rising costs, the Detroit Water and Sewerage Department (DWSD) faced a quandary.

Sam Smalley arrived in June 2007 as assistant director of asset maintenance to take on the challenge of improving residential customer service and beefing up maintenance and rehabilitation, while keeping water rate increases to a minimum.

He has made tough choices to improve efficiency in the department and to set priorities for improvements to the sewer and water systems. He is also leveraging technology — from simple tools like new root-cutting nozzles to sophisticated approaches like GIS tagging.

Tall order

Smalley's supervisor, Pam Turner, who recently retired as director of water supply operations at the department, charged Smalley with a mission. "One of my goals with the system was to make sure more

attention was focused on residential customers, and to treat them with the same attention as our wholesale customers," Turner says.

"But underground infrastructure is something nobody sees or notices until something breaks. If we have rate increases, the customer needs to see the value of what they're paying for."

Smalley was recruited from one of the department's wholesale customers: he had been the City

"One of my goals with the system was to make sure more attention was focused on residential customers, and to treat them with the same attention as our wholesale customers."

Pam Turner

of Dearborn's water and sewerage utility manager. "Sam told me that he wanted to make some improvements to the department's operations and that it was going to cost some money," says Turner.

"Essentially he said that if we invested, the department would deliver. I approved that plan with one goal: to reduce the number of customer complaints and increase service. Sam's a pretty smart guy,



Boiler operator Donzell Burns works atop a lift rack with a CIPP liner roller and water feed. (Photography by Gerald Bernard)



PROFILE:
Detroit (Mich.)
Water and Sewerage
Department

INCORPORATED:
1806

CUSTOMERS:
4 million

AREA:
143 square miles

DEPARTMENT STAFF:
2,200

INFRASTRUCTURE:
3,400 miles of waterlines;
3,600 miles of sewer lines

ANNUAL BUDGET:
\$362 million
(2009-10 operations)

WEB SITE:
www.dwsd.org



Repair worker Carl Truitt uses a Vactor truck to clean a sewer main on Detroit's east side.



Greg Edwards, sewer safety inspector, checks the progress of a camera inspection.

"That outreach has been credited with significantly improving relations with wholesale customers. We needed to put an equal amount of energy into improving service to retail customers. This is an enterprise utility, and its operations are funded entirely by the people who pay the bills."

It's a delicate balancing act. Water demand in the Detroit area has declined by about 15 percent over the past five years, and customers have to make up the reduction in revenue. In 2009, more than half of the 8.9 percent increase in residential rates resulted from lower demand.

Smalley's first order of business

was to begin to restore customer confidence by reviewing recent complaints received by the department and comparing it to the corresponding backlog of service requests. A red flag went up in relation to the repair of lawns and asphalt after water main break repairs.

"We had a \$17 million backlog of work required for asphalt and lawn restorations," says Smalley. "That may look like a good place to save money, but this is one area where what the department does is most visible. When the repairs aren't done well, it's something the customer sees every day, and it's a difficult thing for people who take pride in their properties and the community."

Smalley asked for and received an additional \$3.5 million for the current fiscal year to address the most needed repairs.

Demolition orders

A second backlog involved at least 10,000 vacant properties. Detroit Mayor David Bing had made the demolition of these properties a priority.

"Unfortunately, due to difficult economic conditions, these properties have been abandoned," says Smalley. "Many of them are flooding because pipes burst in freezing weather, or due to metal thieves, who strip the houses of copper pipe. The houses can't be demolished without cutting of the service, or the demolition could tear the

REVITALIZING THE FLEET

When Sam Smalley took on the job as assistant director of asset maintenance with the Detroit Water and Sewerage Department he found he had a fleet of 27 combination sewer cleaners at his disposal. Unfortunately, some of them were ready for disposal.

"Of the 27 trucks, I had about six or seven that were roadworthy, and a few that were operating intermittently," says Smalley. "The city hadn't bought a new truck in about 10 years because of budgetary constraints."

The units were almost all Vactor trucks. "My guys know the Vactor brand," says Smalley. "We had a few units from other manufacturers at one point, but if you're trained to use one brand and are familiar with operating it, you don't want the guys jumping into the one truck they're less familiar with when they get out of bed in the middle of the night to answer an emergency call."

"We needed to maximize the assets we did have to get those combination cleaners back on the streets." To devise an action plan, Smalley approached the local Vactor dealer, Jack Doheny Supplies, part of the Jack Doheny Companies.

"We've been dealing with the city for 40 years," says Dan Weber, president of Jack Doheny Companies. "We also happen to be the largest rebuilder of Vactor sewer cleaning equipment in the world."

The first order of business was culling the herd. Non-standard machines or those beyond repair were auctioned off. Weber's crew identified the best of the older units that could be put on the road soonest and at lowest cost. "We evaluated three of their oldest trucks, which were 1996 or 1997 vintage," says Weber. "Generally we wouldn't rebuild trucks older than 10 years, but even though these were slightly out of range, we felt it was the fastest way to get more trucks on the road."

The trucks were stripped to the sub-frame and the key components — water pump, fan and vacuum system, high-pressure hose reels and boom — were replaced. The trucks themselves were treated to new suspensions, brakes, wheels and tires, engine service, and a fresh coat of paint.

In four to six weeks, three units were restored to full service at a cost Smalley estimates at about 40 percent of the price of a new truck. "We started cautiously, but the refurbishing initiative was so successful that we continued," he says. "We've now rehabilitated 11 of those older machines."

With high personnel turnover in the department, Smalley also turned to Jack Doheny for training to help extend the life of the units. "We trained operations staff on maintenance and easily manageable repairs," says Weber. "We focused on things like the walk-around of the truck at the beginning of the day, using the right accessories for the job, the use of specialized nozzles, cleaning the fan housing, and draining water from the pumps at the end of the day in cold weather."

Mechanical department staff members were also given factory repair training. "The city has made great strides in improving its sewer maintenance and cleaning program over the past four years, and we're proud to be part of it," says Weber.

service connections right out of the water main."

To reduce the backlog, Smalley observed the standard method for severing and sealing service connections. "They were digging a hole 3 feet by 5 feet by about 5 feet deep at the property line using hand shovels," says Smalley. "To help speed up the process, we ordered four mini-excavators from John Deere and Caterpillar that can quickly and easily dig holes up to 7 feet deep."

Instead of sending four workers to each site, the department now sends one operator and one laborer. Productivity on severing service connections has increased from two to three per day to 15. As of September, the 10,000-residence backlog stood at 350. The department has also been catching up on delinquent accounts, shutting off service before flooding becomes a problem.

Detecting water loss

Smalley says the work is helping to control leakage and stabilize overall water pressure, but it has been difficult to pin down progress. "It's a large system that can support a large amount of leakage," he says. "We have the capacity to pump 1.8 billion gallons of water per day, and on average we move 600 million gallons. Even a change in water temperature on a system that large can skew the

readings significantly. Still, we know we're making a difference."

At 3,400 miles in total length, the city's water mains date back as far as 1875, the largest portion of them cast iron. Newer sections were added as the city expanded. Lines range from 1.4-inch copper tubing to 120-inch concrete mains.

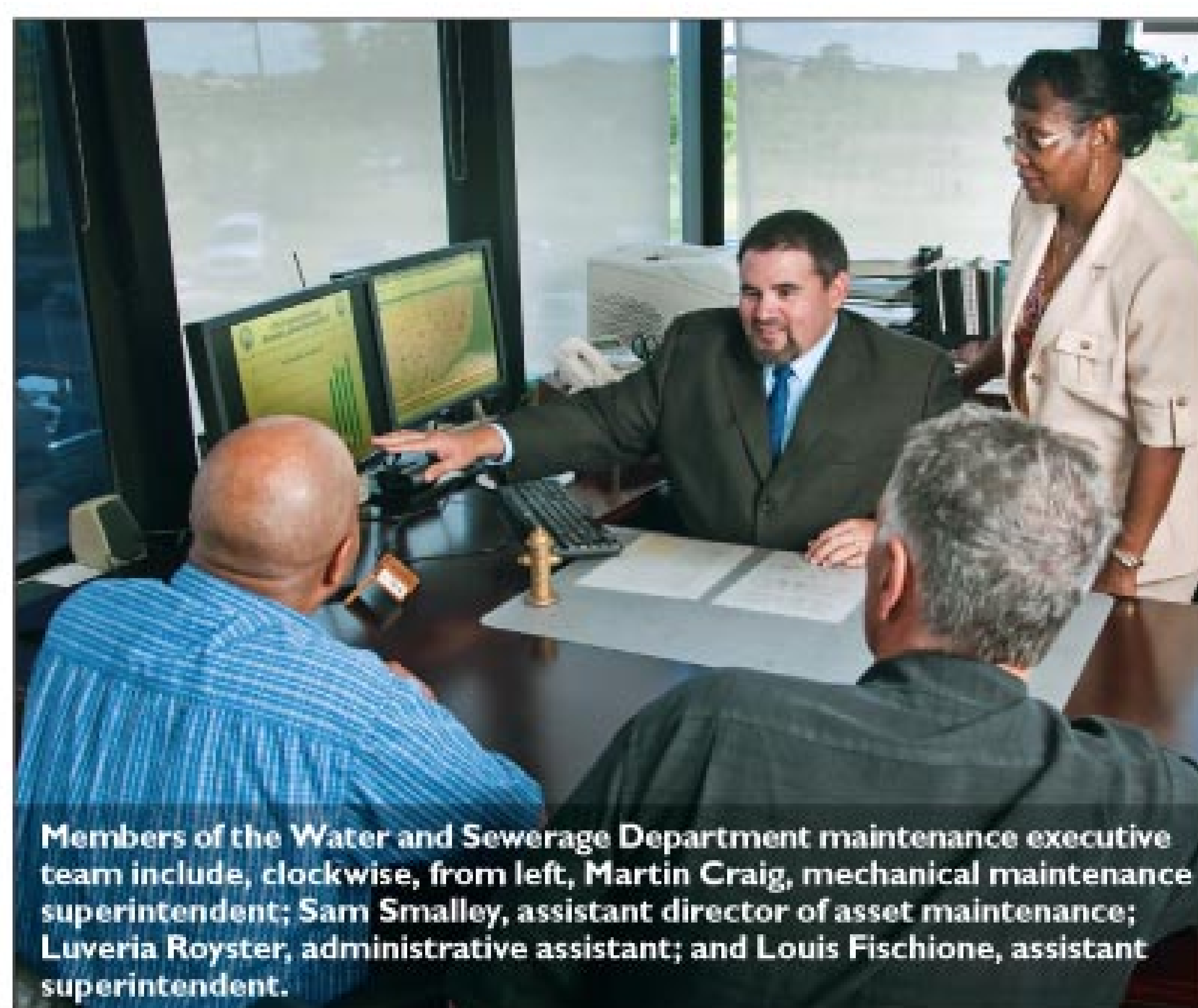
Leak monitoring is carried out in-house and by dedicated consultants. "We largely use acoustical detection," says Smalley. "We also monitor sewers during downtime to detect large volumes of water that appear out of place."

The city is also dealing with sections of water main supplied by a now-defunct manufacturer of prestressed concrete cylinder pipe. "As is typical with this product, we're seeing damage to the stress wires that support the shell," says Smalley.

Repairs to water mains are largely dig-and-replace with ductile iron pipe. While the city has been looking at other trenchless methods, it abides by standards set by the American Water Works Association. "Without guidance of the AWWA on trenchless rehab for potable waterlines, we can't plan on using any of those methods," he says.

Electrical efficiency

The department has also made efficiency improvements to its five water treatment plants, 22 pumping stations and assorted booster stations by installing variable-frequency drives to reduce energy consumption. The drives adjust the speed of the electric motors to



Members of the Water and Sewerage Department maintenance executive team include, clockwise, from left, Martin Craig, mechanical maintenance superintendent; Sam Smalley, assistant director of asset maintenance; Luveria Royster, administrative assistant; and Louis Fischione, assistant superintendent.

meet actual pumping demands. Plant controls have also been replaced by computer-automated treatment process systems.

The city's 3,600 miles of brick, concrete and other sewer lines, varying from 4-inch piping to 20-foot tunnels, date back to 1875 and earlier. "When I got here, a large number of sewers had not been cleaned in some time," says Smalley. "A lot of that had to do with the sidelining of our combination sewer cleaner fleet. The year before I arrived, they had cleaned 40 miles. In my first year we cleaned 75, in my second we cleaned 105, and as of September this year we've already cleaned more than 330 miles with a goal of 400 miles by end of year."

The causes of sewer blockages are typical: primarily sediment, with roots and grease following a

close second. Smalley discovered, however, that the weak link in the root-control program was the technology used to cut the roots.

"We have trucks costing hundreds of thousands of dollars, and when I took a look at our selection of sewer nozzles, they were outfitted only with cheap, small jets," he says. "I retired those and invested in Bulldog nozzles from ENZ USA Inc. They were more expensive but led to a significant increase in our productivity."

With a few hundred miles of sewer line clear of roots, the city contracted DownUnder Municipal Services of Kalamazoo in 2009 to begin a root-foaming program using the Vaporooter product.

Dedicated camera truck

The department maintains a dedicated camera truck outfitted

Water meter foreman Terry Craig uses a GPS system to check the status of dispatched trucks and print out reports on meter data.



An outside contractor works for the city on a complete rework of a storm drain.



“Our staff members are eager to take on the training, adopt the new technologies and help to uncover new efficiencies where they find them. Technology is only as good as the people who use it.”

Sam Smalley

with a remote-controlled camera from Aries Industries, but the sheer magnitude of the sewer clean-up program precludes a detailed video inspection on every job.

“We also have a video truck with a QuickView camera by Envirosight on a carbon fiber pole,” Smalley says. “After we clean a line segment, we pop the manhole cover, dip the camera into the manhole, and look upstream and downstream to see whether the cleaning has been effective or not. That has worked well for us.”

The department is also in the middle of an \$80 million, three-year cured-in-place pipe lining program for its sewer assets, relying on customer complaint data to target the effort. The contractor performing the work is also responsible for a thorough video inspection of the rehabilitated lines, adding to the Detroit video database.

To help better plan sewer and water maintenance, Smalley has divided the city into four districts — east, west, north and central. Five of the city’s 18 Vactor combination cleaners are dedicated solely to cleaning sewers on a scheduled basis. Others are dedicated to each district.

Specialized equipment is shared

among all districts. That shared pool includes an industrial vacuum loader (Guzzler Mfg.); an Elgin Sweeper; a continuous rodder; easement machine and bucket machines (Sewer Equipment Co. of America); a 3,500-gallon-capacity liquid vacuum truck from Presvac Systems; and a pair of fuel trucks.

GIS tracking

All work orders and problem reports are now computer-logged and tagged with GIS information using the ArcGIS system from ESRI and its built-in reporting software tools. “When we run our reports, we get a graphic representation of which district requires most of our energy,” says Smalley. “If we have a basement flooding complaint, it goes on the GIS system.”

“When we plot a water main break, it shows up on the GIS system. It’s much easier to target main replacement efforts when you can see the data on a GIS display instead of in database form.”

The department is also using GIS technology to keep tabs on system infrastructure. Even the city’s 28,000 water mains are being inspected, photographed, and tagged with GIS information, along with a report on their condition.

The majority of the depart-

ment’s maintenance and repair fleet is also monitored by GIS. “We know when the PTO of a Vactor truck is engaged, and we know it’s being used as a piece of equipment instead of just driving around the city,” says Smalley. “We know the locations of the vehicles and the status of the main engine. We’ve achieved a significant reduction in fuel consumption based on eliminating unnecessary idle time.”

Most GIS reports were initially accessible on dedicated computers available to managerial staff only. A new initiative is aiming to make many of the reports available to technical staff as well, by exporting the data to a more user-friendly Web-based platform. Even residential water customers can now access daily Web-based reports on the volume of water pumped through the system.

Despite the emphasis on technology, Smalley credits hard-working staff members for helping to turn the department around. Many of the best ideas for department efficiencies come from employees, who advise Smalley on what works in the field.

A considerable number of staff members are also voluntarily working toward Michigan Department of Natural Resources and Envi-

The Detroit Water and Sewerage Department crew includes, from left, Robert Davis, repair worker; Muchoki Bryant, repair worker; Anthony Johnson, helper; Steven Way, helper; Craig Staley, repair worker; Juanita Oakes, repair worker; Ronald Leapheart, mechanic; John H. Johnson, repair worker; Joseph Richardson, mechanic; and Jonathan Eli, mechanic.

ronment Drinking Water Operator Certification, which offers five levels of certification, with Level 1 the highest attainable.

“Many of the new hires are already aiming for Levels 2 or 3,” says Smalley. “I’ve also told them that if they get their licenses I will make my best effort to ensure that it means something to them in the future. They’re eager to take on the training, adopt the new technologies and help to uncover new efficiencies where they find them. Technology is only as good as the people who use it.” ♦

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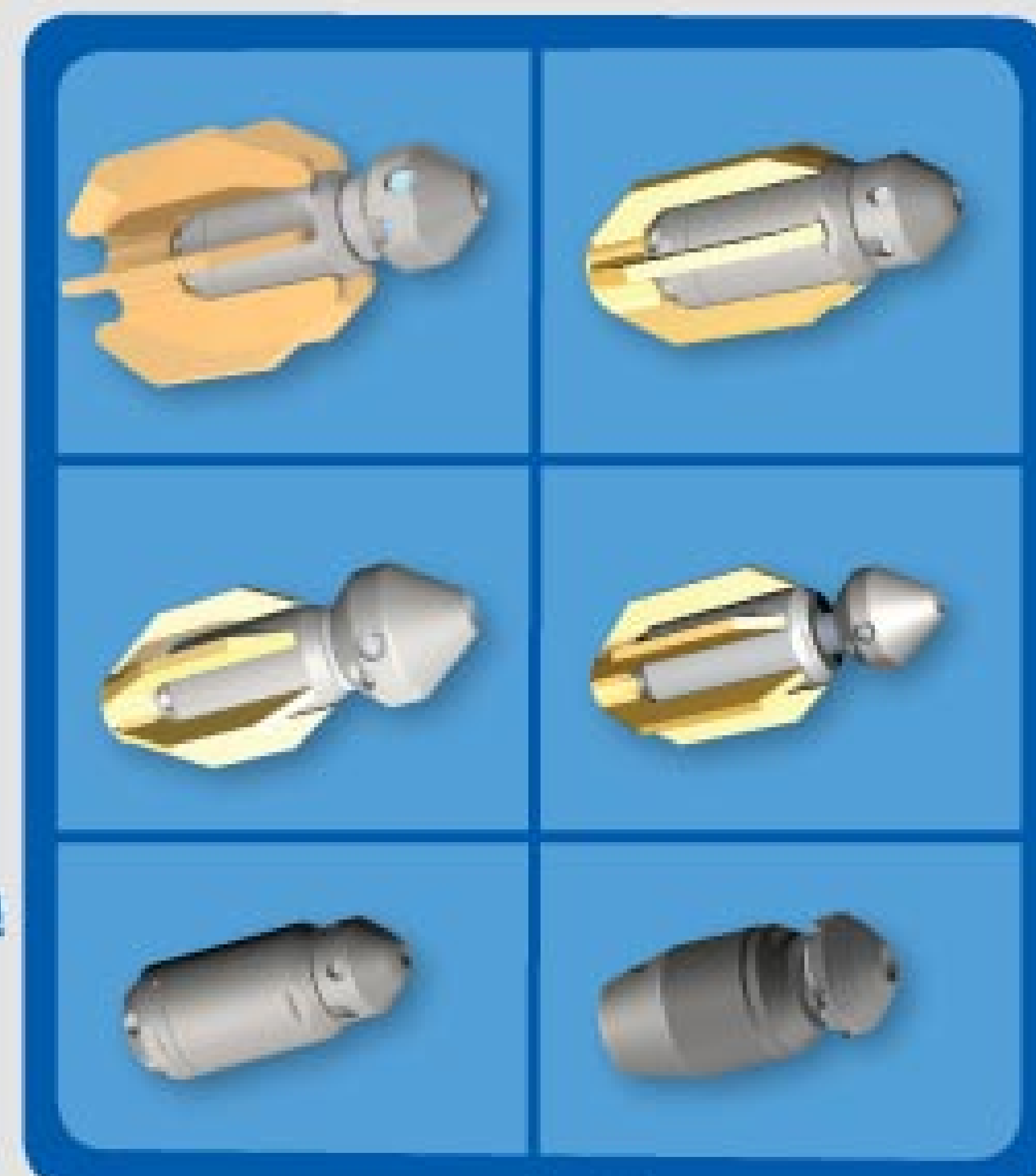
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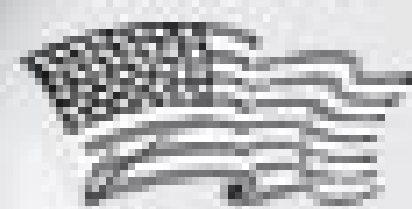
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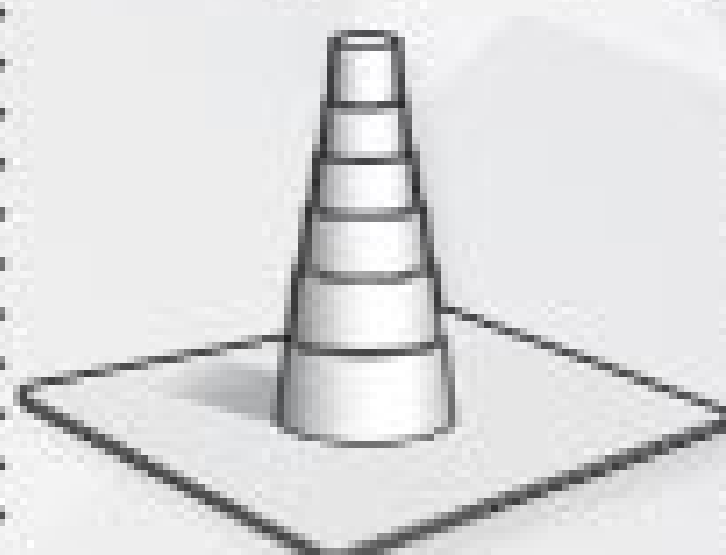


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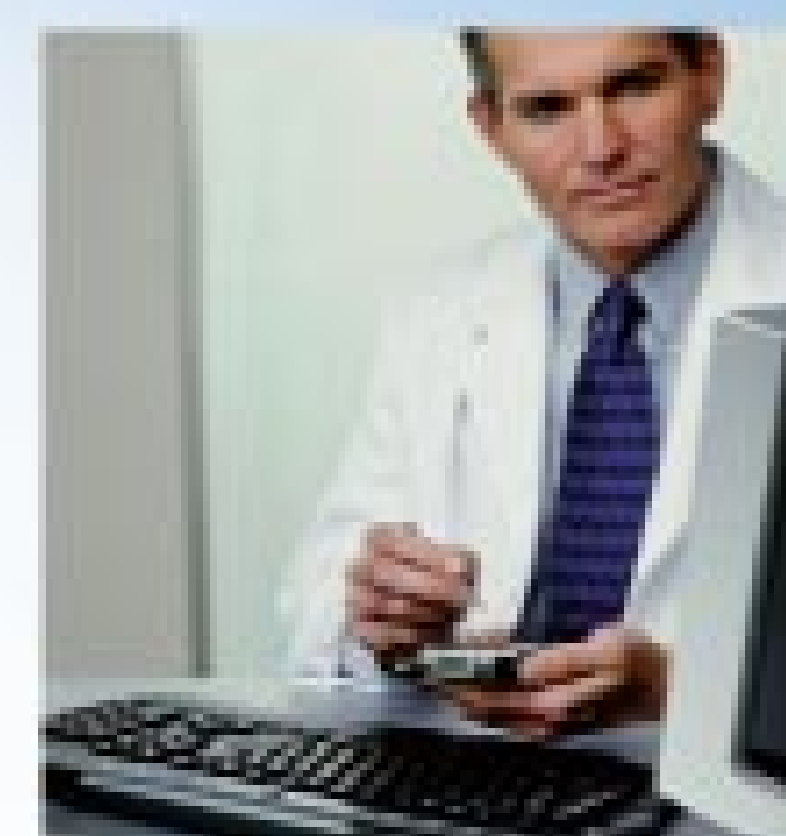
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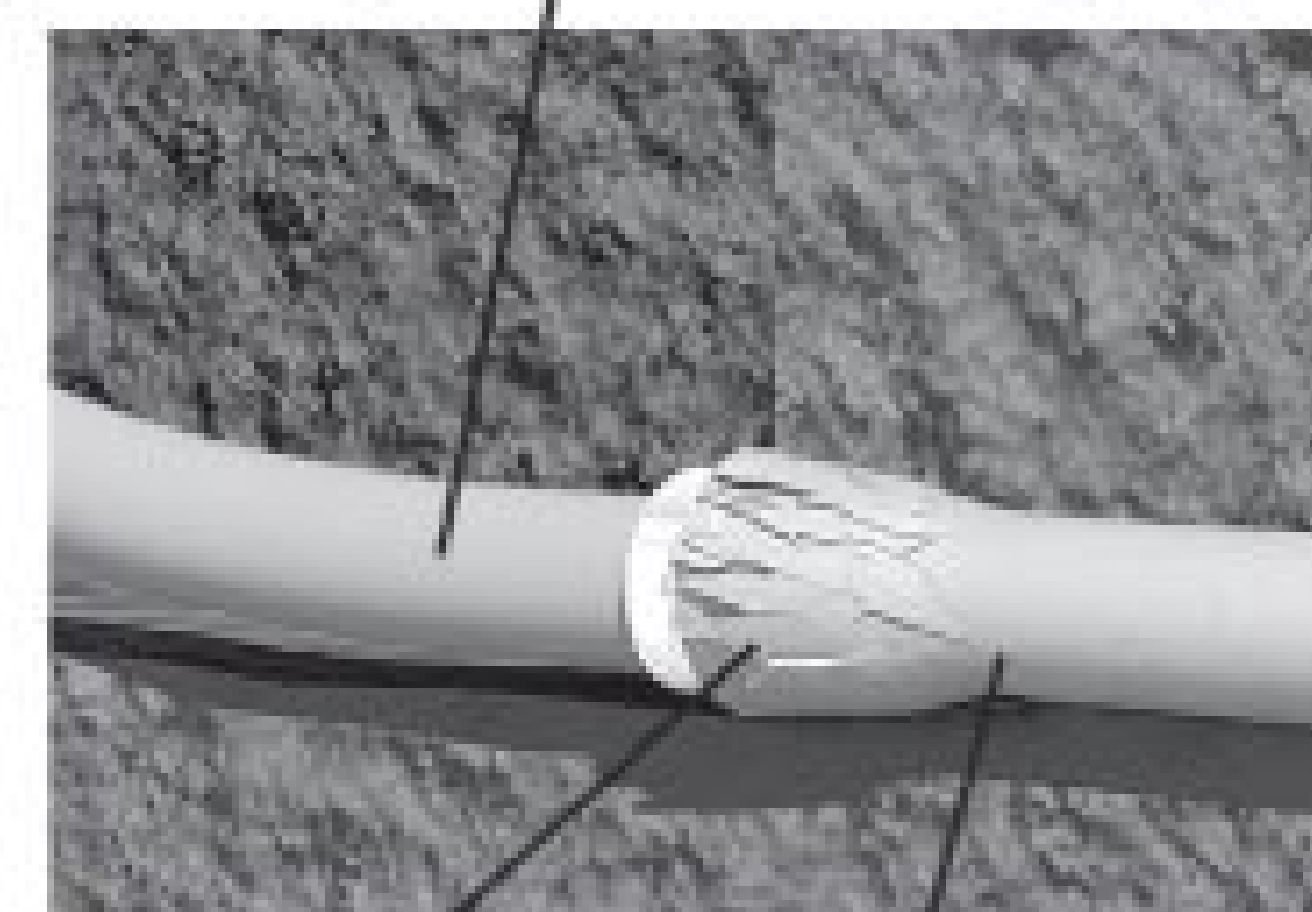


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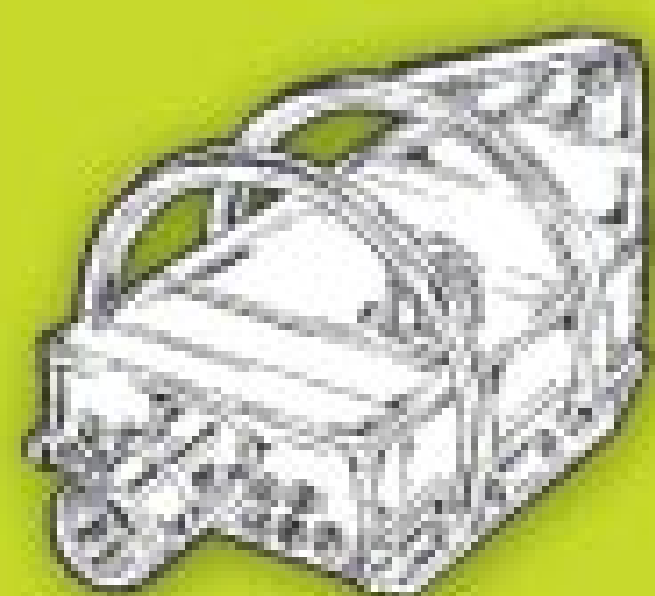
new pipe is installed versus
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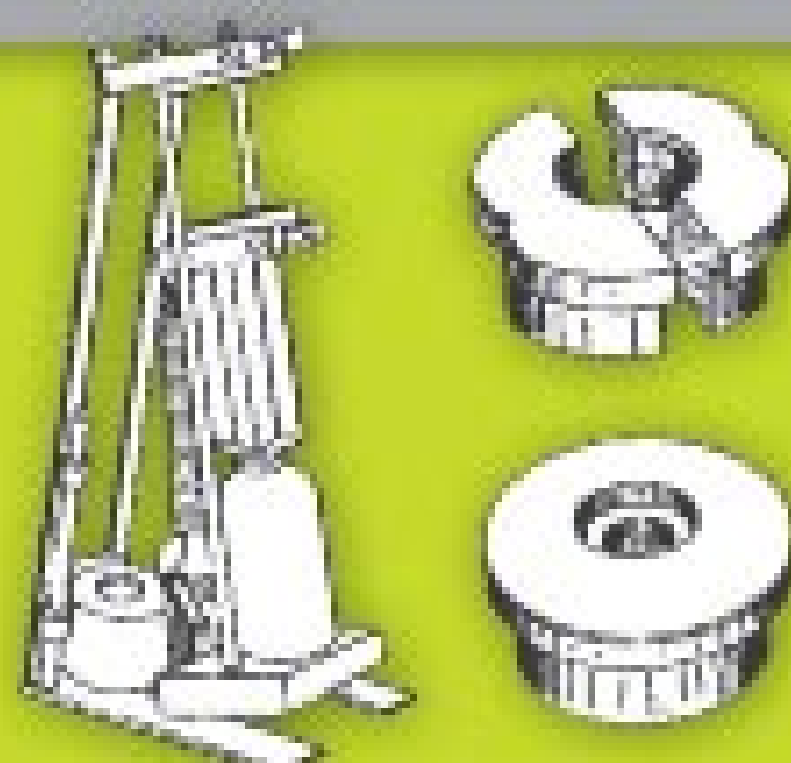
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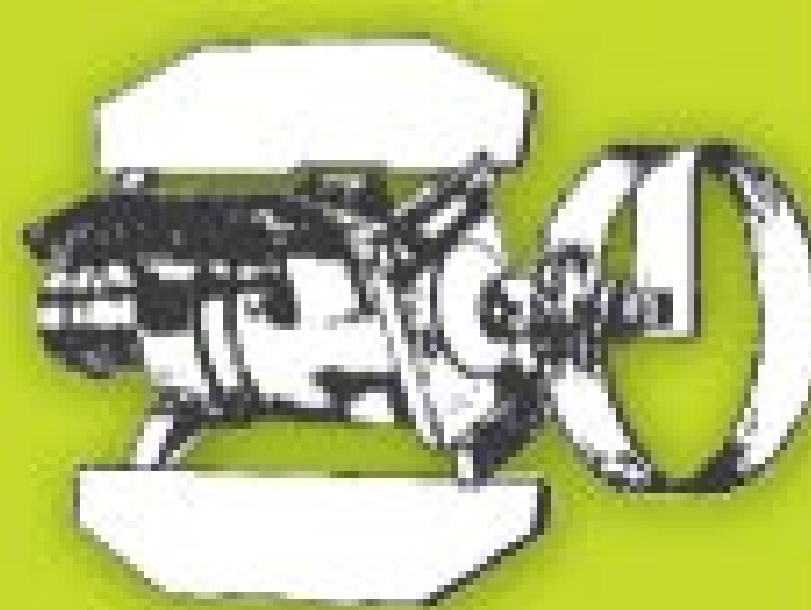
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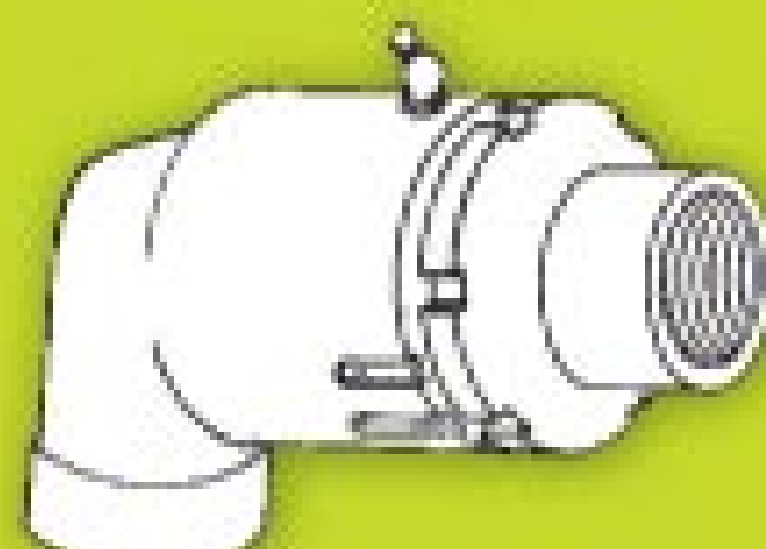
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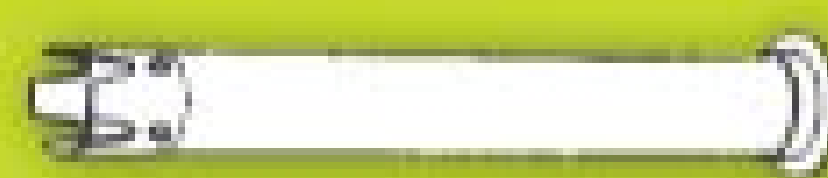
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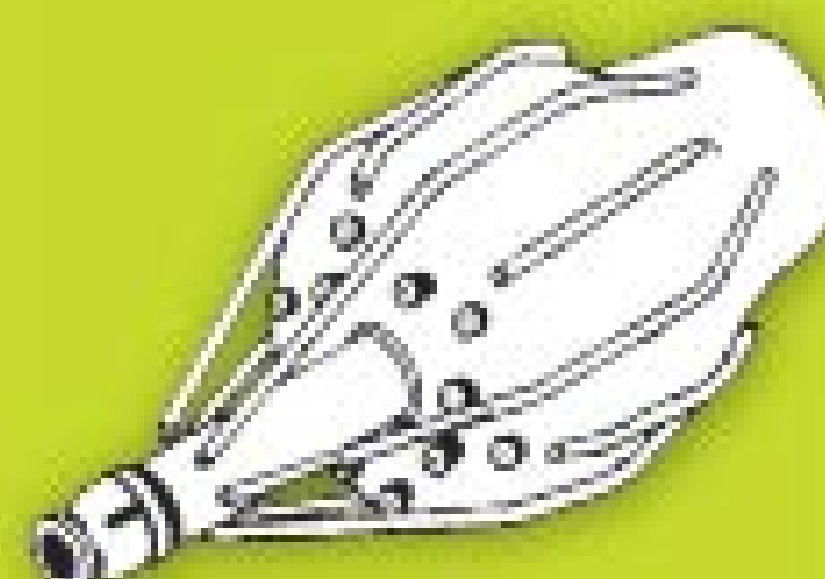
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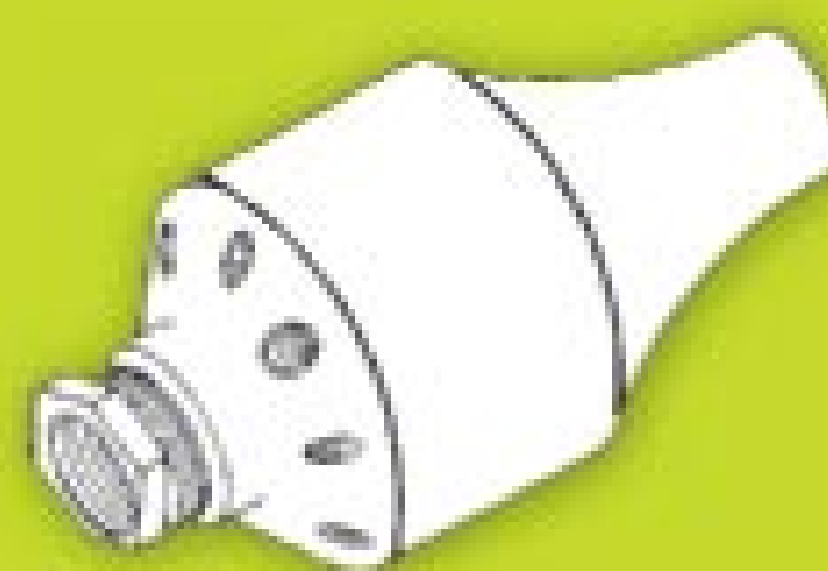
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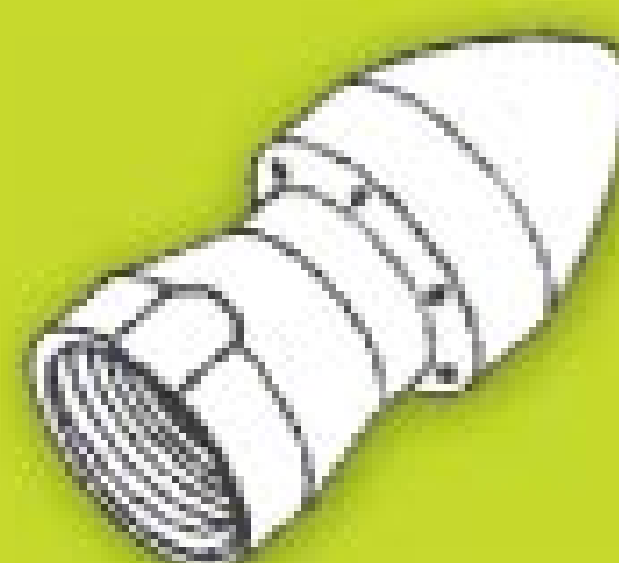
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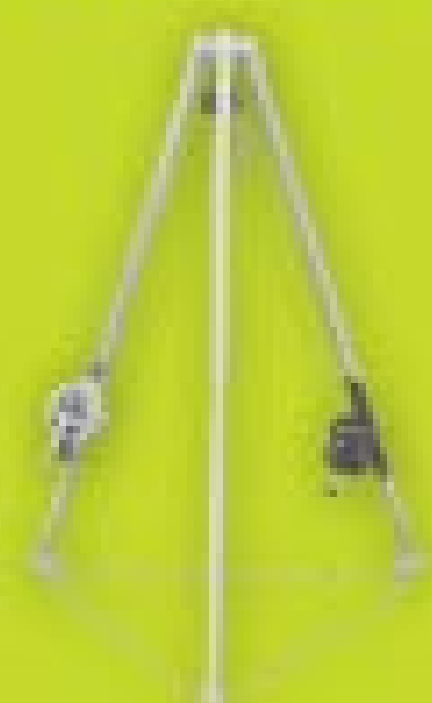
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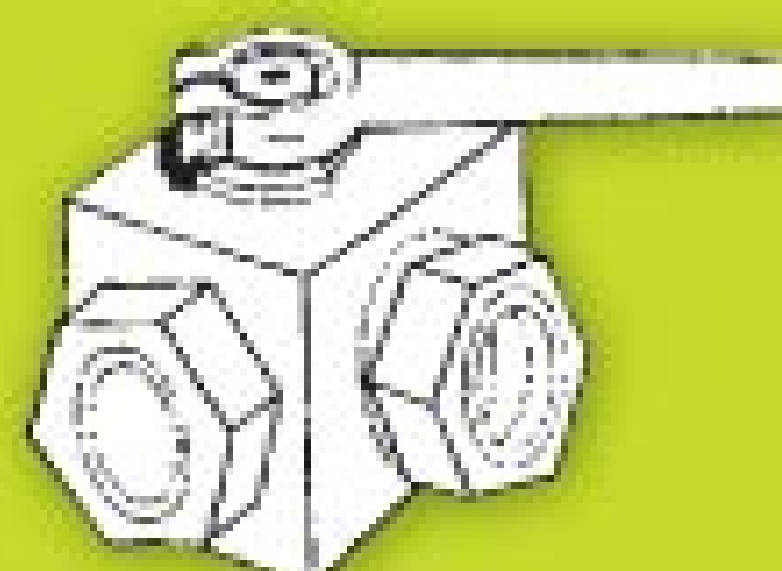
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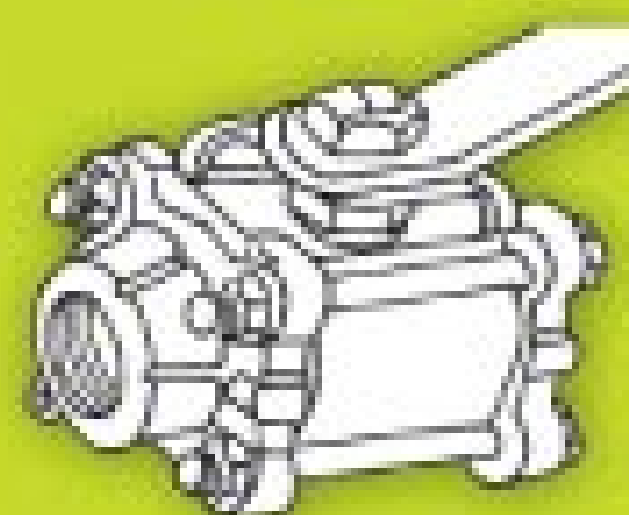
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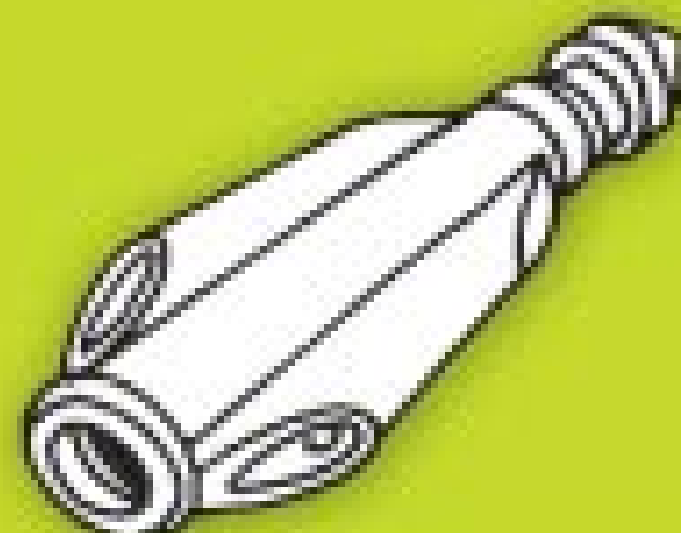
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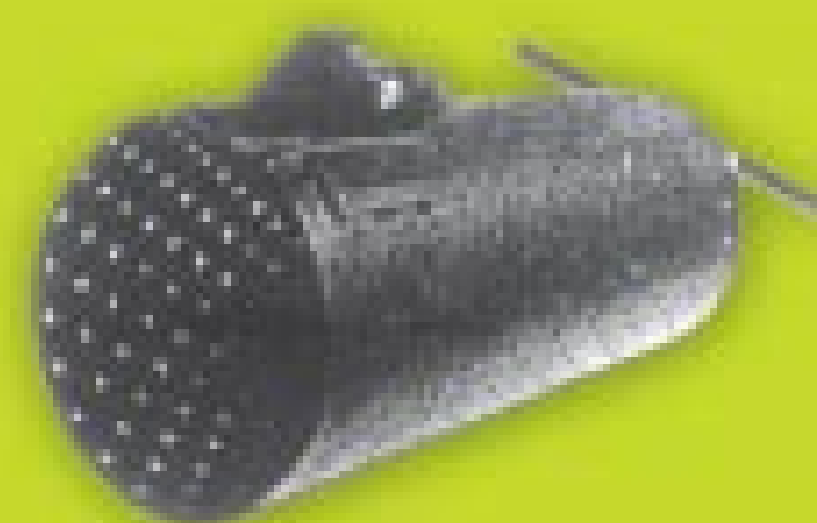
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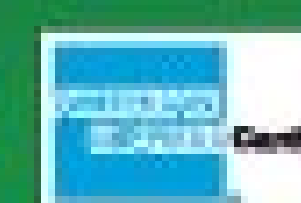


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BUILDING RELATIONSHIPS

Networking remains a key reason why individuals and companies renew their memberships in NASSCO year after year

By Ted DeBoda, P.E.

With the holidays in full swing, it's the time when we think about relationships with our family and friends. It's also a good time for individuals and organizations to acknowledge relationships with business associates that have allowed them to advance professionally.

We have recently confirmed that developing relationships within NASSCO is very important to our members throughout the year. In fact, networking and building relationships with other individuals in the trenchless industry are the top reasons why contractors, municipalities, engineers, consultants, manufacturers and others join NASSCO.

Strong response

Back in September, through

an independent research firm, we launched online surveys of 25 questions, delivered to all NASSCO members in good standing. The high response rates, averaging 20 percent for each group, are a strong indicator that NASSCO members care deeply about the association and the overall growth of the underground construction industry.

We learned a number of interesting things through this research,

We have recently confirmed that developing relationships within NASSCO is very important to our members throughout the year.

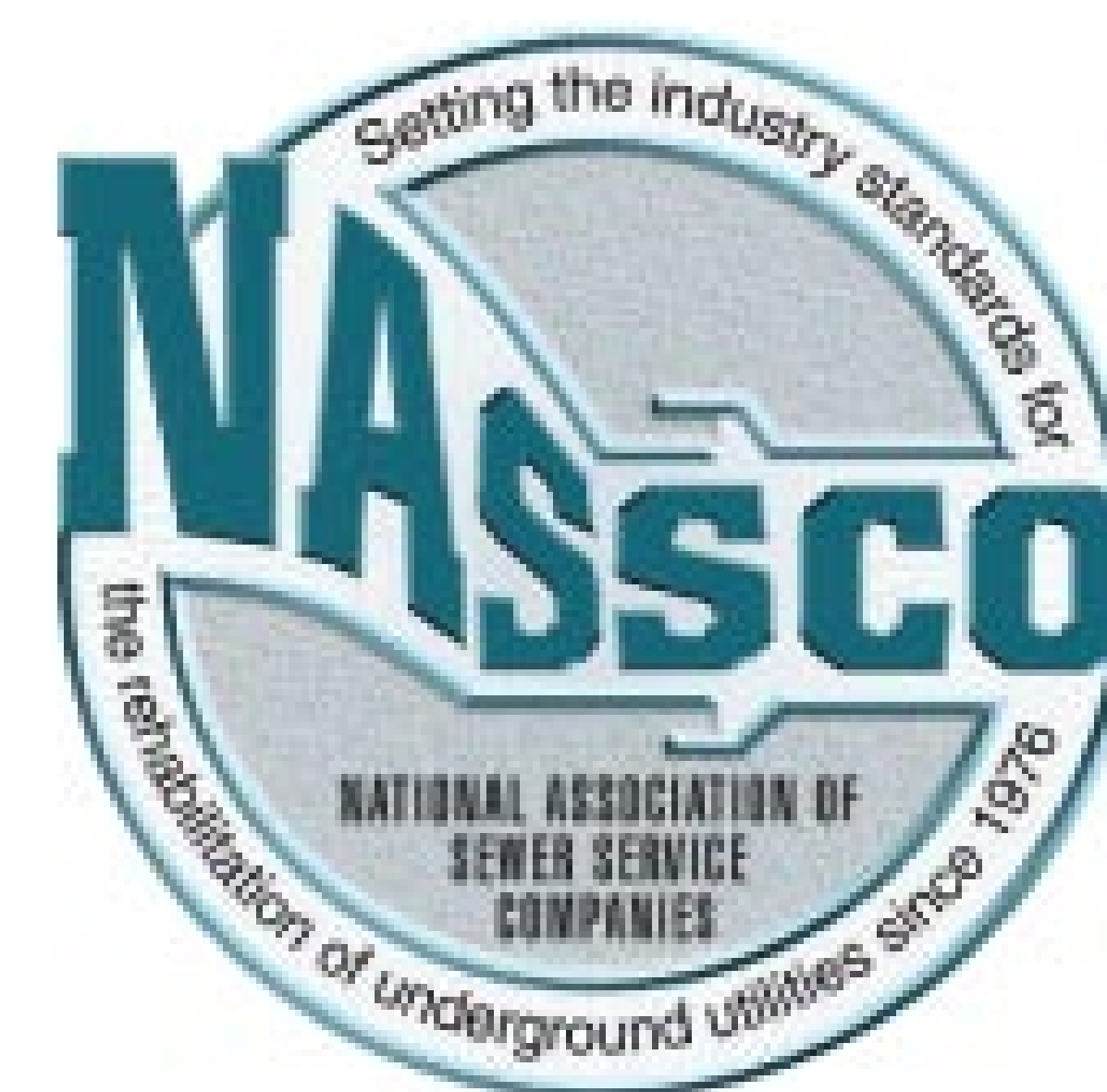
which we are using as a measurement tool against baseline research conducted back in 2007. For instance, we confirmed that members continue to become involved with NASSCO because of the relationships they develop. Network-

ing is also the main reason these groups renew their NASSCO memberships year after year.

Less obvious are the reasons NASSCO members consider networking so important. At first glance one may assume networking is important because it provides opportunities for members to build relationships to help their businesses grow.

But when we dig a little deeper, we realize that members want to

network and be active because they want to be involved in moving our industry forward and performing NASSCO's mission: to set industry standards for the rehabilitation of underground pipelines and to assure the continued accep-



tance and growth of trenchless technologies.

Education and training

Members feel their contributions to the industry, coupled with opportunities to network, help to improve awareness of deteriorating underground infrastructure, to emphasize the shortfall in much-needed funding, and to work together to promote the benefits of the trenchless industry as a whole.

Networking was followed closely by education and training as the number two reason why people join NASSCO, and these findings also reinforce our 2007 baseline study. One change in the trend was the increase in members who join in order to participate in NASSCO's annual meeting each February.

It's not surprising, because this meeting culminates all of the key benefits of membership in one event, offering two full days of extensive training, education, and the sharing of industry knowledge, with plenty of opportunity for socializing and networking through social events that include our annual golf tournament.

To review the research findings and to learn more about NASSCO's upcoming annual meeting, please visit www.nassco.org. ♦

Ted DeBoda is executive director of NASSCO. He can be reached at director@nassco.org. NASSCO is located at 11521 Cronridge Drive, Suite J, Owings Mills, Md.

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WHAT IS YOUR TITLE?

- ☐ President/CEO/Owner ☐ Manager/Supervisor ☐ Operator/Worker
☐ Engineer/Consultant ☐ Manufacturer/Distributor
☐ Other _____

WHAT IS YOUR COMPANY'S PRIMARY SERVICE? (check only one)

- ☐ Oilfield Services ☐ Gas/Mining Services ☐ Equipment Sales/Manufacturing
☐ Industrial/Commercial/Municipal Services ☐ Trucking/Hauling
☐ Other _____

WHEN IT COMES TO EQUIPMENT AND OTHER PURCHASING DECISIONS, WHAT IS YOUR ROLE?

- ☐ Final decision maker ☐ Heavily involved ☐ Somewhat involved
☐ Not at all involved

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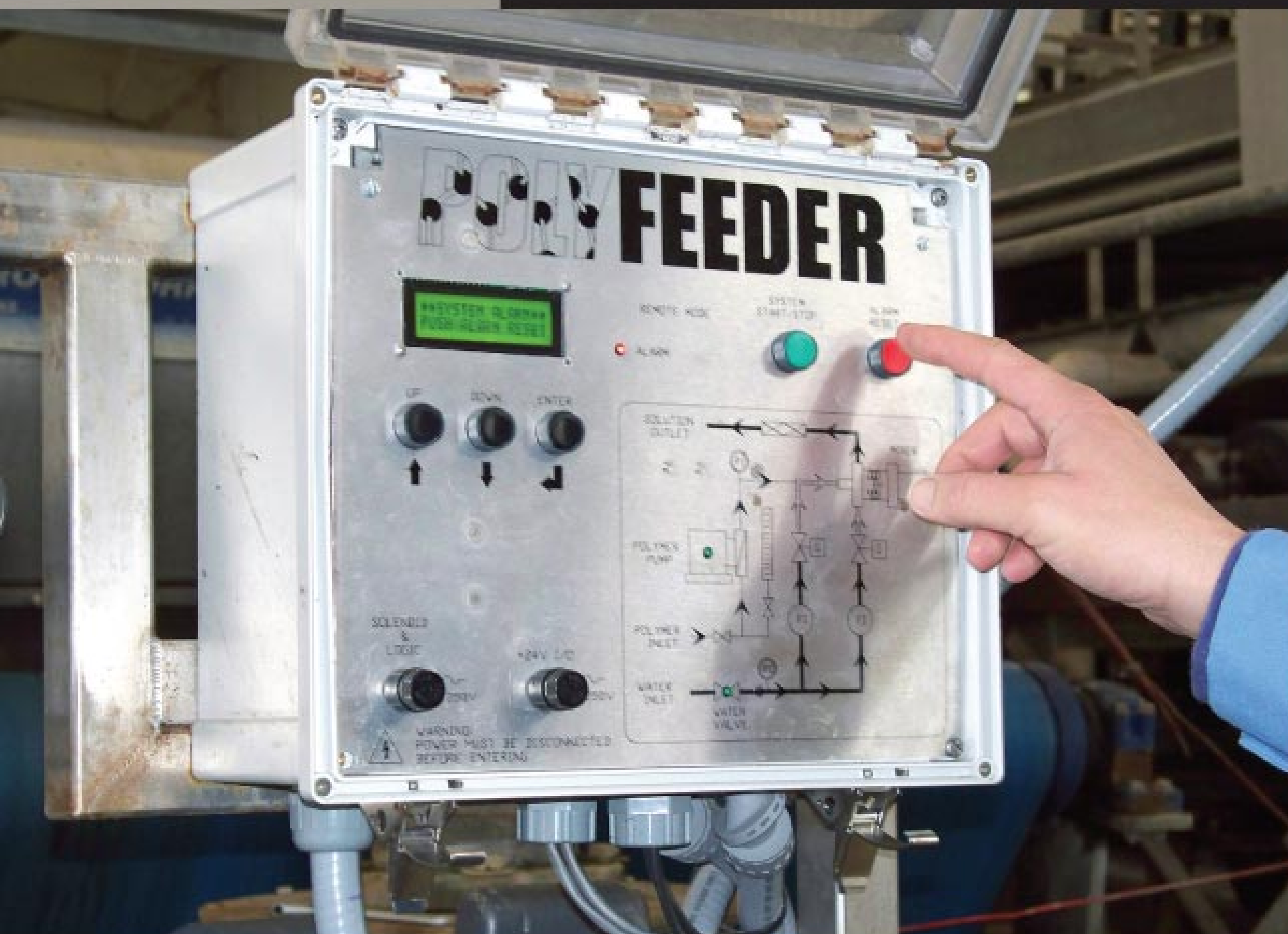
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The digital control on the Polyfeeder emulsion polymer blending system is designed to be straightforward and easy to operate. (Photos courtesy of Calvin Bremer)

BETTER MOUSETRAPS

PRODUCT:

Polyfeeder emulsion polymer blending system

APPLICATION:

Biosolids dewatering

BENEFITS:

Chemical savings, increased production

USER:

Wallace R. Knox Wastewater Treatment Plant, Texas City, Texas

MANUFACTURER:

Pulsafeeder Inc.

A BETTER BLEND

An automated emulsion polymer blending system helps a Texas treatment plant improve dewatering and cut polymer costs

By *Scottie Dayton*

“The new system is far more efficient. It mixes the polymer through the sludge better so it dewateres faster with a much drier cake. It has improved our process quite dramatically.”

Calvin Bremer

The Wallace R. Knox Wastewater Treatment Plant in Texas City, Texas, operates one of two belt presses seven days a week during normal work hours, dewatering an average of 72,000 gpd of feed sludge.

Every three to four weeks, however, the spring-loaded check valve in the aging emulsion blending system became caked with polymer. It took staff one day to dismantle the chemical feed pump and clean the mixing chamber with polymer solvent.

“We had capacity to store sludge in the digester for a day or two, but interrupting the dewatering

process wasn’t very efficient,” says wastewater superintendent Calvin Bremer. “Neither was the polymer mixing chamber. It was breaking the polymer chains and not giving us a homogenized mix.”

Bremer consulted Matt Davis at Hartwell Environmental Corp., a distributor in Tomball, Texas. Davis brought in George N. Argiris from Pulsafeeder Inc. in Houston, who suggested two systems.

Bremer chose the Polyfeeder emulsion polymer blending system from Pulsafeeder Inc. in Rochester, N.Y. Since it went online in June 2009, the unit has worked without interruption, increasing dewatering production, and sav-

ing the city thousands of dollars in polymer expenses.

Vertical loop reactor

The Knox plant flow averages 4 to 6 mgd. Wastewater is treated in a vertical loop reactor, basically an oxidation ditch system flipped on its side. A horizontal baffle divides each rectangular tank into upper and lower compartments. Disc aerators are on top and coarse bubble diffusers are on the bottom. The under-over flow pattern allows reactors to be installed in deeper tanks, reducing land requirements.

The aerobically digested sludge is dewatered in a 2.2-meter Klam-

press filter press from Ashbrook Simon-Hartley and a 2.5-meter Series 518 Sludgepress from Ovivo, that the staff is rehabilitating. The waste activated sludge runs 8,000 to 10,000 mg/l mixed liquor suspended solids (MLSS) with 2 to 3 percent solids.

"With the old injection system, we ran the presses at 150 gpm and got 16 to 18 percent solids cake," says Bremer. "Today, we process at 200 to 250 gpm and get 18 to 21 percent solids cake."

The real eye-popper came when Bremer looked at the data for polymer used. The old system required about 13 gpd, and Bremer spent \$2,139 on a 275-gallon tote every three weeks. "The Polyfeeder uses about 5.4 gpd," he says. "I was astounded when I saw the numbers. Now we go a month and a half before ordering the next tote."

Making it fit

The staff installed the modular polymer system in one day. To make room for it on the catwalk, they unbolted and moved the hydraulic pump. John Condame and another associate from Pulsafeeder then programmed the unit's straightforward digital control and trained the entire staff to operate it in one session.

"There was a bit of a learning curve, but they caught on quickly," says Bremer. "What's really cool is that the operators don't have to make a bunch of adjustments. They just set the water to where they want it, adjust the polymer percentage, and the computer does the rest. For the most part, the system runs the same day in and day out."

In two months, operators learned to get the most from the system. The machine has a clear, high-shear mixing chamber and an anti-clog injector lance that discharges into the process stream. The unit has run without major maintenance. Operators change a hose occasionally, but they do it in the morning before starting the press.

"The new system is far more

Water flows from the biosolids during dewatering. The belt press runs seven days a week during normal work hours, dewatering an average of 72,000 gpd of feed material.



Biosolids flow onto the belt press for dewatering. The Polyfeeder system mixes the polymer in thoroughly so that the material dewateres faster with a drier cake.

efficient," says Bremer. "It mixes the polymer through the sludge better so it dewateres faster with a much drier cake. It has improved our dewatering process quite dramatically."

The Knox plant lime stabilizes and heat processes some cake into Class A biosolids. The city's Solid Waste Management Department mixes the material with wood chips to make mulch used in ditches and parks. "The pH is too high for flowerbeds," says Bremer. "We're looking at doing some Class B composting, but that's down the road."

Within seven months, the Polyfeeder paid for itself in poly-

mer saved. The Knox treatment plant staff is considering upgrading the emulsion blending system for the Sludgepress when it is rehabilitated. ♦

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PUNCHING THROUGH

A pipe bursting system from Pow-R Mole gets a workout in a training session involving replacement of a line serving a 198-unit apartment complex

By Gil Longwell

Pipe bursting is one of several trenchless methods for replacing sewer laterals.

Total project cost is not the sole factor in selecting the repair strategy. Others include service interruption time, surface disruptions and restoration costs, project site accessibility, terrain and the repaired line's service life.

Pow-R Mole offers trenchless solutions that include the PD-6 thrust boring machine. It was used for a line replacement at Grampian Hills Apartments, a 198-unit community in Loyalsock Township near Williamsport, Pa.

The complex has an extensive

collection system that eventually discharges to the township sewers. When faced with a mandate to replace several 8-inch terra cotta gravity mains and install two new manholes, the complex owners chose to replace the mains by pipe bursting. Pine Mountain Excavating of Avis, Pa., did the work using the PD-6 machine.

Grampian Hills head of maintenance Chuck Hutchins monitored the work, which also served as a demonstration of the bursting technology. The Pine Mountain crew included partner Mike Yarnell, backhoe operator Craig Yarnell, service technician Buck



Bursting head, grip and pipe are ready to be pulled to the introduction pit. (Photography by Gil Longwell)

TECHNOLOGY TEST DRIVE

EQUIPMENT:

Pow-R Mole PD-6 thrust boring machine

MANUFACTURER:

Pow-R Devices Inc.

LOCATION OF DEMO:

Williamsport, Pa.

DEMONSTRATED BY:

Rob Jasinski, Pow-R Mole sales representative; Mike and Craig Yarnell, Buck Dugan, Cory Bringer, Pine Mountain Excavating, Avis, Pa.

LIST PRICE:

Approx. \$30,000 as demonstrated

Dugan, and laborer Cory Bringer. Pow-R Mole sales representative Rob Jasinski was present to train the crew on their first use of the machine. The soil on the steep hillside site was bone dry and rock hard on the sunny autumn day when the first run was installed.

Walk-around

The PD-6 has three main components and several subsystems and task-specific options.

A heavy rectangular steel front gate or frame stabilizes the machine. When in use, the frame is oriented perpendicular to the direction of machine force. It is placed in direct contact with the excavated soil workface through which the pipe to be replaced protrudes. In the pulling mode, the frame transfers the load to the exposed soil surface.

A smaller frame supports a 3,000 psi hydraulic cylinder and operates in the same vertical plane as the protruding pipe section to be replaced. The piston has a 12-inch back and forth range of motion, and its centerline is about six inches below that of the driven rod. The piston frame's

flexible coupling to the front gate allows the piston to be angled to suit site conditions. A bidirectional grasping roller system binds the rod to the piston, transferring the piston's motion to the rod. This also transfers 84,000 pounds of pulling force to the rod.

A segmented rod is assembled using 2-inch-diameter, 30-inch-long threaded rods, which are sequentially introduced to or removed from the cylinder's grasping roller. For insertion, each rod is threaded into the exposed end of the string of rods previously inserted. Attached to the piston, the rods are either pushed into the pipe or drawn back into the working pit as the



Pow-R Mole sales representative Rob Jasinski connects hydraulic hoses to the PD-6 bursting unit.



To help the crew understand the process, Rob Jasinski laid out the bursting head, a rod section, the gripper, and a section of old pipe near the exit pit.

bursting head is pulled through the damaged pipe.

The bursting head is screwed onto the end of the first rod. Attached to the head is a pipe grip that makes the joint connecting the new HDPE pipe to the pulling rod. A variety of bursting heads and pipe grips are available to accommodate all pipe diameters.

Hydraulic power for the unit can be provided by a backhoe or similar machine, or by an auxiliary hydraulic pump available from the manufacturer. The auxiliary pump may be needed if the backhoe cannot deliver the necessary hydraulic pressure or flow rate.

The PD-6 unit measures 17 inches high, 54 inches long, and 21.5 inches wide and weighs 720 pounds. Hydraulic demand is 3,000 psi at 18 to 25 gpm. Delivered force is 84,822 pounds with a 12-inch stroke.

For this project, because of the working depth of the machine, the bursting unit was mounted in a 4-foot-deep by 6-foot-long by 3-foot-wide shoring push box. This box surrounded the machine and satisfied OSHA requirements.



Rob Jasinski, right, coordinates backhoe operations with a crew from Pine Mountain Excavating (not shown) while apartment complex head of maintenance Chuck Hutchins and other complex employees engage in "sidewalk supervising."



When manipulated like an opening fist, the chain on the bucket pulls the pipe into the introduction pit.

Operation

The pipe replacement project began when the pits were excavated at two adjacent manholes. Because the bursting machine would be installed in one of the pits, the most accessible site was selected for the purpose.

The introduction pit's bottom

dimensions were about 60 by 72 inches, and the depth was governed by the depth of the pipe being replaced. The target depth was set about 15 inches below the pipe centerline, and the final depth was about 11 feet. The exit pit had final dimensions of about 3 by 8 feet and 12 feet deep. The two pits



The expanding pipe gripper used on 8-inch HDPE pipe. When the eye is turned, an expansion mechanism grasps the interior of the pipe to be pulled.

were about 140 feet apart.

With the existing pipe exposed in both pits, the manhole at the introduction pit was plugged to keep the work site clean and mostly dry. A trash pump was positioned near this manhole, and its discharge hose was run downslope to the manhole at the exit pit. The manhole was monitored for accumulated sewage and, as warranted, the pump was activated.

In both pits, the terra cotta pipes were cut, leaving a short stub of the original pipe protruding from each manhole. At the opposite ends of the pits, the pipe protruded into the pit from the enclosing soil.

Mounted in the shoring push box, the PD-6 unit was lowered into the introduction pit and positioned with the front gate straddling the old terra cotta pipe where it disappeared into the soil. Next, soil was backfilled around the working end of the unit to transfer thrust forces from the box to the excavation wall. This also minimized lateral box movement.

With hoses connecting the backhoe's hydraulic system to the PD-6, the first rod section was fitted with a rounded end and inserted through the roller guide and into the old pipe. The rod was pushed into the pipe and another rod section was screwed in place. Because there was no significant resistance, muscle power was used to attach and advance additional rod sections. With about 30 feet of rod inserted into the pipe, it was no longer possible to push the rod by hand, so the hydraulic cylinder was put into use.

When the rod emerged in the

exit pit, the bursting head was screwed to it, and the pipe grip was inserted into the end of the HDPE replacement pipe. As a threaded screw was turned into the gripper, the gripper's body expanded within the pipe, tightly clamping the pipe between the gripper's external collar and the expansion mechanism.



The rod (silver tip) has been pushed to the exit pit, where the bursting head waits.

Because of the exit pit's depth, the relative stiffness of the HDPE pipe and the need to make two sweeping 90-degree bends, the backhoe was used to position, guide and encourage the pipe into position at the point where it would enter the original pipe. Once in place, the gripper and bursting head were then joined by means of a clevis.

Work again focused at the introduction pit where the PD-6 was put into pulling mode. In 12-inch increments, the bursting head and trailing HDPE pipe were pulled toward the pit. As crew members took turns at the controls, each developed a rhythm that continued until the bursting head reached the area where the insertion was slowed by an unknown obstacle. Limited by the backhoe's hydraulic capability, the auxiliary hydraulic power unit was put into service, and bursting continued.



The auxiliary hydraulic unit stands ready in the work area around the introduction pit. Pine Mountain partner Mike Yarnell (dark shirt) and Chuck Hutchins watch as crew members (not shown) operate the PD-6 bursting unit.

"We selected this machine, and pipe bursting generally because together they offer the highest quality end product for our customers."

Mike Yarnell

When the head emerged in the introduction pit, the last rod section was removed from the bursting head. The backhoe was used to lift the shoring push box with the PD-6 out of the trench. The combined efforts of hand shoveling and backhoe excavation removed the previously placed stabilizing backfilled soil, and the head was exposed and removed.

The grip, still gripping the pipe, was connected to the backhoe bucket by a chain. With a motion resembling the opening of a fist, the action of the backhoe bucket drew the pipe farther into the pit. After the grip was removed, the pipe was trimmed and joined to the stub from the manhole. The process was repeated at the exit manhole. The holes were back-filled and the surface restored.

Observer comments

The PD-6 appeared to be an effective, uncomplicated machine. Worker safety within the shoring push box left little risk of injury. Workers' hands and feet were naturally clear of the machine's few moving parts during the pull. Operator training is minimal as

the concepts are straightforward, and advanced skill levels are not necessary.

Manufacturer/ user comments

"We selected this machine, and pipe bursting generally because together they offer the highest quality end product for our customers," notes Mike Yarnell of Pine Mountain. "From a business owner's perspective, this system is more productive than other technologies in linear feet completed per day and in dollars delivered to our bottom line. Every job site will bring challenges that cannot always be anticipated. At the end of the day, the repairs we set out to do are completed as planned."

Jasinski of Pow-R Mole notes that the PD-6 machine has steerable horizontal thrust boring capabilities that enable installation of new pipes and cables in virgin areas. ♦

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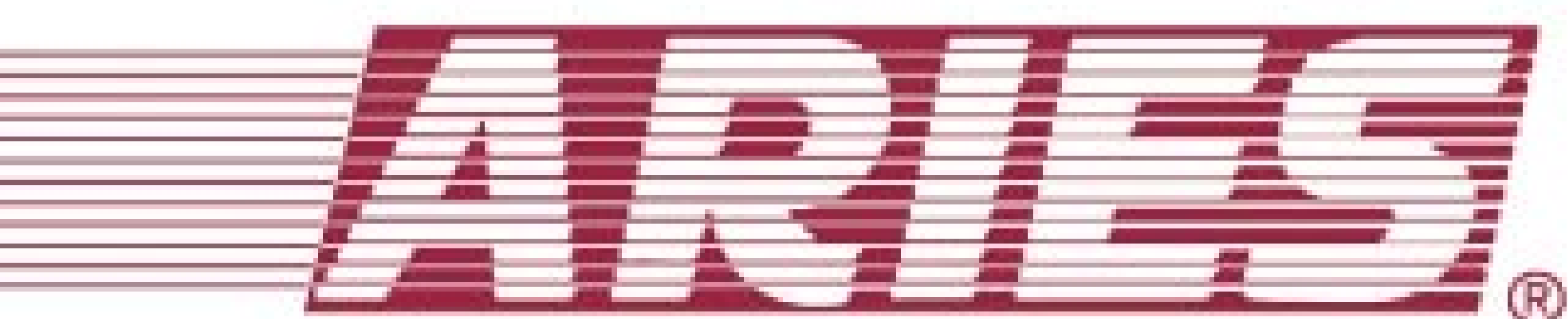
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We are reaching out to industry professionals and their families who would be interested in participating in a talent contest to be held during the 2011 Pumper & Cleaner Expo. Prizes would be awarded to the top three finalists.

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2. A YouTube link of the video showcasing your talent.

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CONTEST RULES

1. You must be present and registered for the 2011 Expo. No transportation or hotel accommodations will be provided.
2. A video from all applicants performing their talent must be submitted to COLE Publishing in advance. All talents must be appropriate for all age groups.
3. An independent panel will pick the top ten finalists from the submitted videos.

4. The top ten finalists will then need to perform their talent in front of industry peers on Friday, March 4th, 2011 at the 2011 Pumper & Cleaner Expo.

5. The audience will be able to vote for their favorites and the top 3 vote getters will be the winners.

* All materials submitted become the property of COLE Publishing, Inc. and may be used for promotional or other purposes.

Pumper & Cleaner Expo Heads to Indianapolis in 2012

The 2012 Pumper & Cleaner Environmental Expo International will be held in Indianapolis, Feb. 27 to March 1. The Indianapolis facility has more than 4,000 connected hotel rooms, shopping and dining, all within walking distance. More information will be available at the 2011 Expo in Louisville, March 2-5. The 2010 Expo drew nearly 4,000 companies and 13,000 attendees from 48 countries.



Per Ohstrom

Godwin Pumps Names Ohstrom VP of Marketing

Godwin Pumps has named Per Ohstrom vice president of worldwide marketing and business development. He will be based at the company's headquarters in Bridgeport, N.J. Ohstrom has a Bachelor of Science degree from Lulea University of Technology in Sweden and a Master of Business Administration from Northwestern University.

Jamko Launches Web Presence

Jamko Technical Solutions Inc. has launched www.jamkocorp.com, a Web portal devoted to the company's products and services. Features include case studies, technologies and methodologies associated with the company's remote imaging business.



Perma-Lateral Receives PMG Listing

The Perma-Lateral System, manufactured by Perma-Liner Industries Inc., received PMG (plumbing, mechanical and fuel gas) listing No. 1068 from ICC Evaluation Service LLC. Products listed under the ICC-ES PMG program undergo evaluation based on requirements in such codes as the International Plumbing Code, the International Mechanical Code, the International Residential Code, the International Fuel Gas Code, the Uniform Plumbing Code and the Uniform Mechanical Code.

Vanair Benefits Wounded Warrior Project

Proceeds from the August Vanair Poker Run 2010 benefitted the Wounded Warrior Project, supporting the U.S. Armed Forces and their families. The Third Annual Vanair Poker Run is set for Aug. 20, 2011.

Radiodetection Places First in Locate Rodeo

Radiodetection placed first and third in the Power division, second and third in the Telecom division and was third in the Gas division of the 9th Annual International Utility Locate Rodeo, held in Atlanta in August and sponsored by the company. The competition tests the skills of damage prevention technicians. Scores from three events determine the winner. Judged on accuracy, each participant is allowed 12 minutes per event.

Bentley Seeks Student Design Competition Submissions

Bentley Systems, provider of infrastructure software solutions, is seeking submissions for its 2011 Student Design Competition, www.bentley.com/studentdesign2011. College and high school students are invited to submit projects designed using Bentley software, along with a short essay describing their work. Judging will be based on creativity and skill in applying design, engineering principles and the use of Bentley technology. Submissions must be received by March 18. A \$1,500 scholarship will be awarded to winners at the college level and a \$1,000 scholarship will be awarded at the high school level. ♦



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ESSENTIAL PLAYERS

Collections system supervisor Ralph Palomares and water operations foreman Ron Hightower help assure El Toro Water District residents of reliable, quality service

By *Scottie Dayton*

The team at El Toro Water District (ETWD) in Lake Forest, Calif., includes two professionals with a combined 61 years of experience in the industry. Ralph Palomares, sewer collections supervisor and industrial waste inspector, joined the district in 1980. Ron Hightower, operations foreman, came on board in 1979.

"Their diligence and dedication are critical to the successful structure," says director of operations Dennis Cafferty. "Both men share their knowledge by training our own personnel and people from outside the district."

Palomares received the 2010 Richard D. Pomeroy Collection System Award at the California Water Environment Association (CWEA) annual conference. The award is presented for long-standing con-

tributions that expand the knowledge, improve methods, and reveal new techniques for professional development among wastewater personnel.

In addition, Palomares' aggressive programs to prevent sanitary sewer overflows helped the district operate for two years without spills before two occurred in July 2010. The district won the CWEA Santa Ana River Basin Section Collections System of the Year Award in 1995, 1998 and 2000.

Hightower was the first district employee to receive his California Department of Public Health (CDPH) D-5 water distribution certificate, the state's highest level of certification. He also holds a

nance program that is compliant with regulatory requirements and is emulated by numerous public agencies," says general manager Bob Hill.

Besides overseeing the 142-mile collection system spanning five cities, Palomares inspects all 200 restaurants in the area as part of the district's FOG program. As a member of the Orange County Waste Discharge Requirement Committee, he discusses the effects new rules will have on sanitation agencies and cities in the county before presenting them with the committee's evaluations.

"Ralph's thorough understanding of the economic and regulatory issues facing the business



Ralph Palomares



Ron Hightower

"Ralph Palomares' commitment resulted in a comprehensive sewer maintenance program that is compliant with regulatory requirements and is emulated by numerous public agencies."

Bob Hill

CDPH T-3 water treatment certificate. The training enabled him to help develop the district's water conveyance maintenance program.

Hightower's accomplishments contributed to El Toro receiving Districts of Distinction accreditation from the Special District Leadership Foundation in 2007 and 2009. It is one of the most prestigious awards in local government.

Trendsetter

"Ralph's commitment resulted in a comprehensive sewer mainte-

community when it comes to FOG and pretreatment source control motivated him to evaluate effective sewer treatment alternatives at reasonable cost," says Hill. "His achievements have encouraged business development and redevelopment."

To protect the county's million-dollar beaches from sanitary sewer overflows, Palomares developed aggressive programs to combat roots, inflow and infiltration (I&I), and calcium deposits in the mains. Once the lines flowed freely, he

told his crews to focus on roots collecting grease and disposable wipes in homeowners' laterals. "They cut and jet them from the cleanout to the main, or advise residents to call a plumber if there is no cleanout," he says.

Community leader

For 20 years, Palomares has been a member of the Orange County district attorney's Strike Force, an environmental crimes unit targeting illegal dumping of grease and other pollutants. His membership ensures that authorities notify him if companies under investigation or with a conviction are operating in the area.

Who's Your Hero?

Do you have a team member who always gives his or her best and consistently goes the extra mile for the community? Here's your chance to recognize that person. "Unsung Heroes," an occasional feature in *Municipal Sewer & Water*, will highlight outstanding sewer and water maintenance and repair professionals.

Send your nomination to editor @mswmag.com. We'll follow up to gather the necessary information, then publish a short profile of your team member in a future issue.

Since 2003, Palomares has been teaching statewide seminars on operating collections systems based on procedures he developed. He shares his FOG management program with any facility that asks for it. "Ralph's leadership and contribution to the industry are highly regarded by his co-workers, the board of directors, regulators, and industry associations throughout the state," says Hill.

"I stress that I worked my way up from green kid to foreman, and that they can specialize in many different areas. If they want their lives to make a difference, this profession is one of the most important industries out there, because people can't live without water."

Ron Hightower

Palomares' latest challenge is convincing management of the need for the best asset management software.

Helping in crises

Hightower supervises seven technicians and oversees and inspects all infrastructure repairs, ensuring that 51,000 customers receive an uninterrupted supply of quality water. But his proudest moments came when he assisted the Laguna Beach Water District during the 1993 Laguna Beach Firestorm.

He helped the department again during the 1994 Northridge earthquake in the Los Angeles area. El Toro participates in the Water Emergency Response Organization of Orange County and California WARN Water Sector Mutual Aid programs.

"Those were exciting days," says Hightower. "During the firestorms, our unit patrolled the entire neighborhood, closing valves and shutting off services to help build up water pressure in the fire hydrants."

After the earthquake, Hightower helped repair damaged waterlines, digging with pick and shovel to reach them. The quake had sheared the cast-iron bell-and-spigot pipes or pushed them inside each other, fracturing the bells. Hightower helped cut out the damaged

sections and replace them with cast-iron or ductile iron pipe.

Lots of outreach

Hightower served 25 years on the district's Safety Committee and now serves on the Emergency Preparedness Committee. "I enjoy meeting people," he says. He distributes information at training sessions for Citizens Emergency Response Teams and presents

seminars on water emergency preparedness in the community.

The district also sponsors a water conservation booth at local events, and Hightower is an integral member of the outreach team. His duties include talking up the benefits of a career in water treatment to junior high school students.

"I stress that I worked my way up from green kid to foreman, and that they can specialize in many different areas," he says. "If they want their lives to make a difference, this profession is one of the most important industries out there, because people can't live without water."

Hightower's concerns focus on how to replace aging infrastructure and who will do the work in the future. "Thirty percent of district workforces in the state will retire in the next five to 10 years," he says. "That's a lot of knowledge walking out the door if we can't capture it."

Though 10 years from retirement, Hightower sees himself working three to four days per week. "I'd like to stay in the water industry," he says. "The district is considering that option because it wants to keep us as mentors and experienced workers." ♦

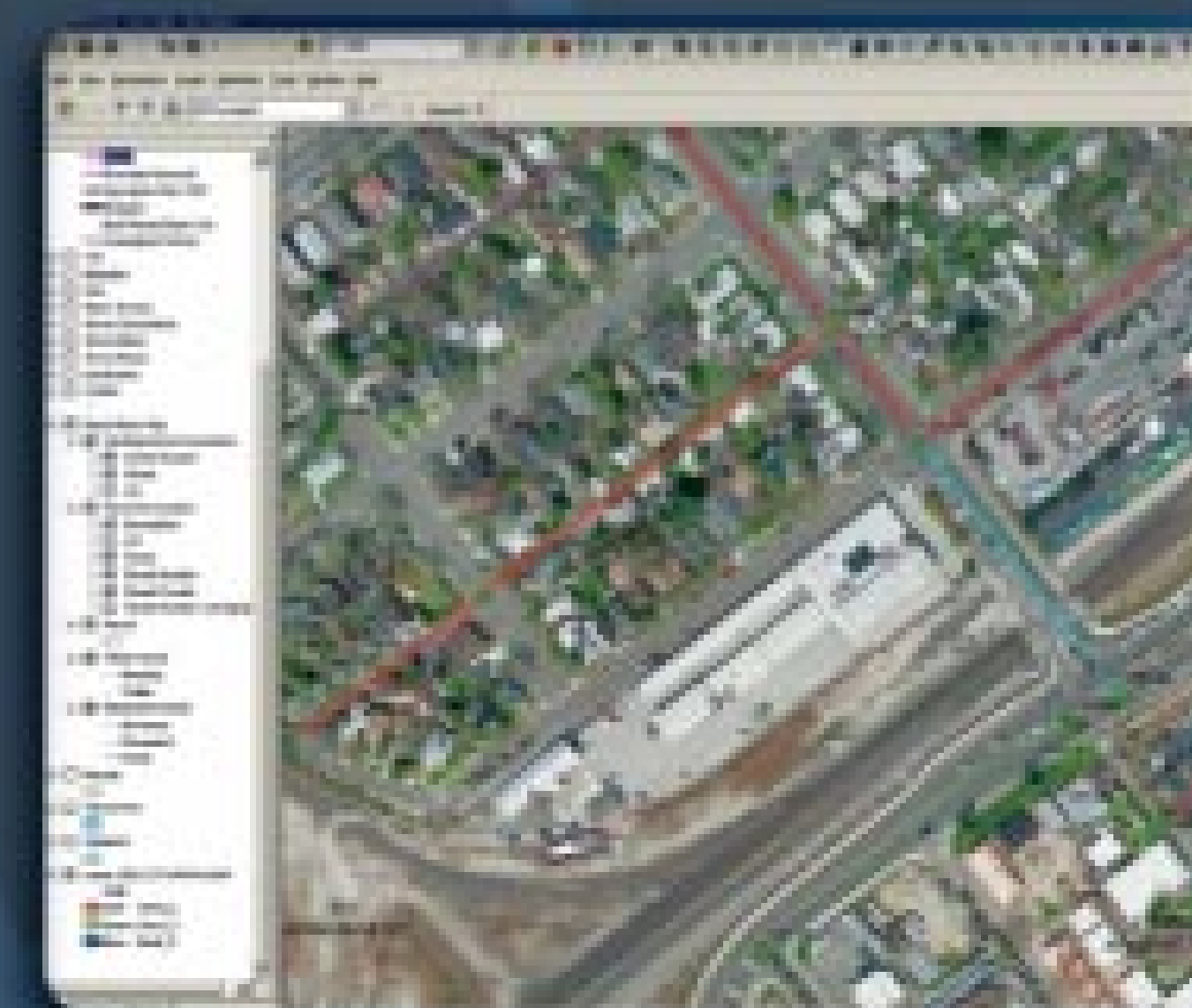
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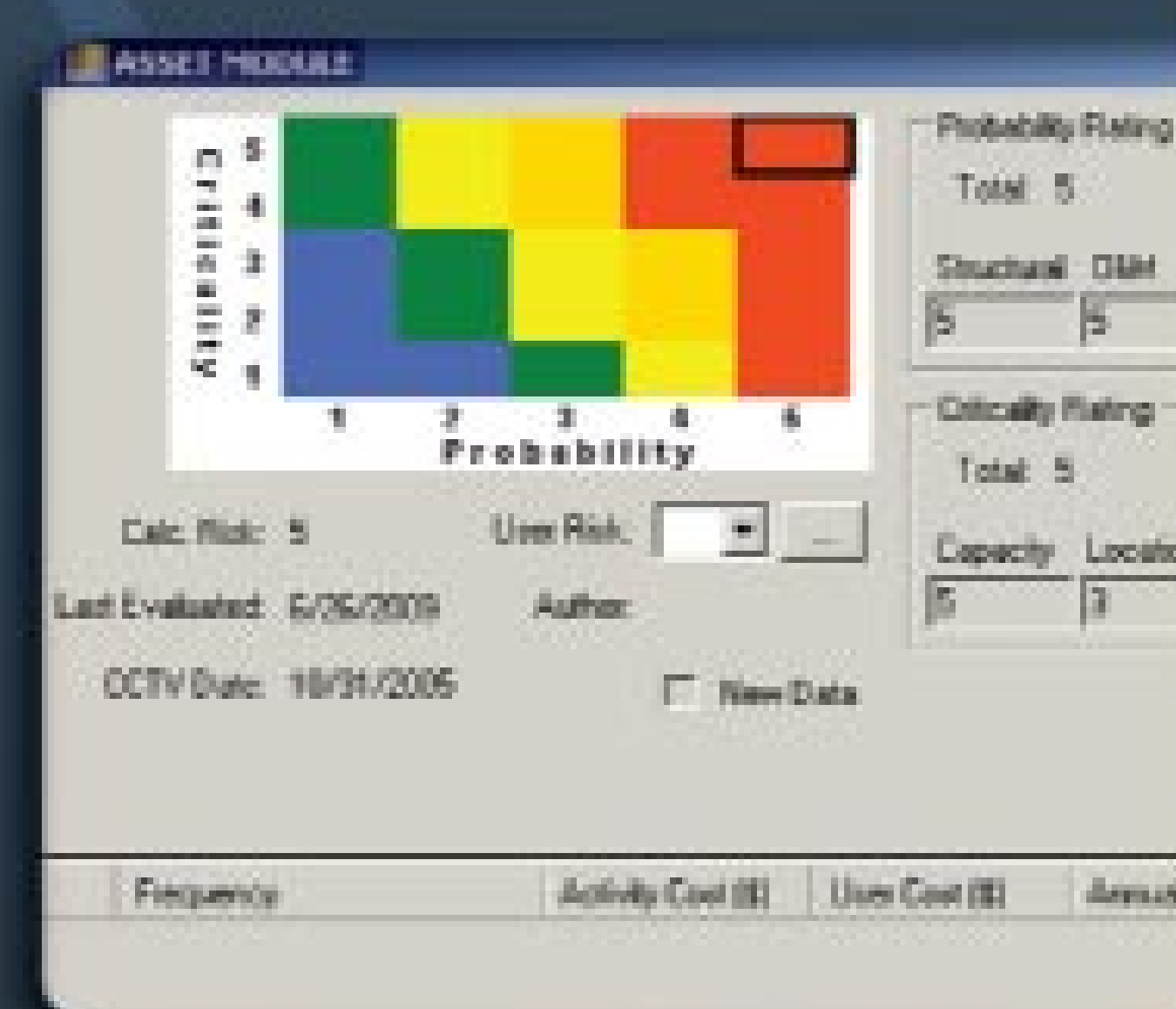
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GET ENGAGED

Managers who connect with their team members on a personal level reap dividends in performance that are well worth the time invested

By Ken Wysocky

It's no big revelation that there's a huge difference between fully engaged employees and those just along for the ride. What's less obvious is that managers can help determine on which end of the spectrum people fall.

A lot rides on that ability. Highly engaged employees perform much better and are more apt to stay at their jobs and contribute significantly. The problem is that many managers think their people are engaged when they're not — or they don't even know the difference, says Barb Krantz Taylor, an employee development consultant for The Bailey Consulting Group, a business leadership and development firm in Minneapolis.

Knowing the difference

So what's a manager to do? For starters, know what defines an engaged employee. "In our definition, an engaged employee has a personal connection with managers, team members, the organization and their own career field that motivates them to excel in their jobs," Krantz Taylor says.

"It's not just that they like their jobs. They're excited and have energy for what they do. They want to learn more and be challenged. If you feel your contributions are recognized and see that what you do makes the organization successful, you're engaged."

By the same token, engaged managers truly care about their employees. While it may sound too "touchy feely" to some, people

want their managers to care. "They don't want managers to be their best friends and socialize with them and buy them birthday gifts," Krantz Taylor says. "It's all about inclusive management practices — giving them some degree of autonomy and self-directedness."

"A manager who isn't a control freak and lets people make some important decisions is engaged. Managers who tell people what to do and don't let them make decisions by themselves are not. If you treat people like sheep, they act like sheep."

How to tell?

Krantz Taylor divides employees into five groups:

- Fully engaged high-potentials. Confident and talented, they have the emotional intelligence and leadership skills to fully apply their excellent technical skills. They need constant growth, learning and challenges.
- Fully engaged high-achievers. These steady performers usually don't want leadership roles. They value their careers but may feel unappreciated because they don't get promoted.
- Partly engaged. While generally positive about their jobs and willing to do what's asked of them, these people aren't "stars." They are emotionally disconnected from their work and adrift in their careers.
- Along for the ride. These un-

motivated underperformers do just the minimum to remain employed. Their talents don't match their jobs.

- C.A.V.E. dwellers (Consistently Against Virtually Everything). With poor attitudes, these people are toxic to everyone except those like themselves, and they may intimidate other team members and their managers.

Where people fall is not always obvious. It's a good idea to start

to do that if they're engaged. Or reflect on each person's greatest skill. "Then you must match as best as you can each employee's talents with goals of organization," Krantz Taylor says. "There's not always a perfect match between what we need and what we get. But by being engaged, the level of imperfection isn't as great."

You should also find out what team members need that management isn't providing. To get that information, Krantz Taylor suggests

"A manager who isn't a control freak and lets people make some important decisions is engaged. Managers who tell people what to do and don't let them make decisions by themselves are not. If you treat people like sheep, they act like sheep."

Barb Krantz Taylor

with a one-on-one meeting with each direct report and ask probing questions that prompt honest answers, instead of just responses they think you want to hear.

"You can ask them what the best day of work in the last six months was like, or what they enjoy most about their job," Krantz Taylor says. "Or ask them when they've felt the most productive in the last few months, or which project was their favorite, and why. You get more clues if you ask questions that probe into why they are sometimes full of energy and enjoying themselves and why other times they're not."

You should also keenly observe when employees go beyond the norm, because they're more likely

working with the human resources department or a consultant to develop a feedback survey on which people can respond anonymously and with candor.

Managerial triage

In most cases, Krantz Taylor suggests focusing on how to make engaged team members even more so, instead of just greasing the squeaky wheels. She advises "performance managing" C.A.V.E. dwellers out of the organization.

In other words, start a progressive discipline process that includes warnings, coaching and written expectations — and have that difficult conversation about how to find a better job fit. Meanwhile,

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.

invest more energy in people who are engaged.

"In my experience, the odds of a C.A.V.E. dweller becoming engaged aren't very good," Krantz Taylor observes. "Often there are a lot of issues — a lot of wrongs you can't fix as a manager.

"When the economy improves, high-performing employees are the people who are most likely to leave, but if they're highly engaged, they'll stay regardless. Don't take them for granted or overwork them, or they might not remain engaged."

Providing feedback is one of the hardest skills for managers to master. Too often, managers are so focused on their jobs that they don't observe their team members as much as they should. And most would rather avoid giving negative feedback because they don't know how to present it constructively.

But even engaged employees need feedback. "Secretly, those

employees feel they get no thank you or recognition, or that the reward for doing good work is only getting more work," Krantz Taylor says. The benefit of giving feedback to high performers is that most of it is positive — you don't need to have those difficult conversations.

Build relationships

The bottom line is managers need to build relationships. Practice the axiom about listening so employees will talk, and talking so employees will listen. "Listening, hearing, communicating and caring are at the bottom of Maslow's hierarchy of needs — and they're what you as a manager need to do," Krantz Taylor says.

"It's amazing how many people feel they don't get that from their manager. In most cases, managers have no idea they are perceived that way, or they simply don't care.

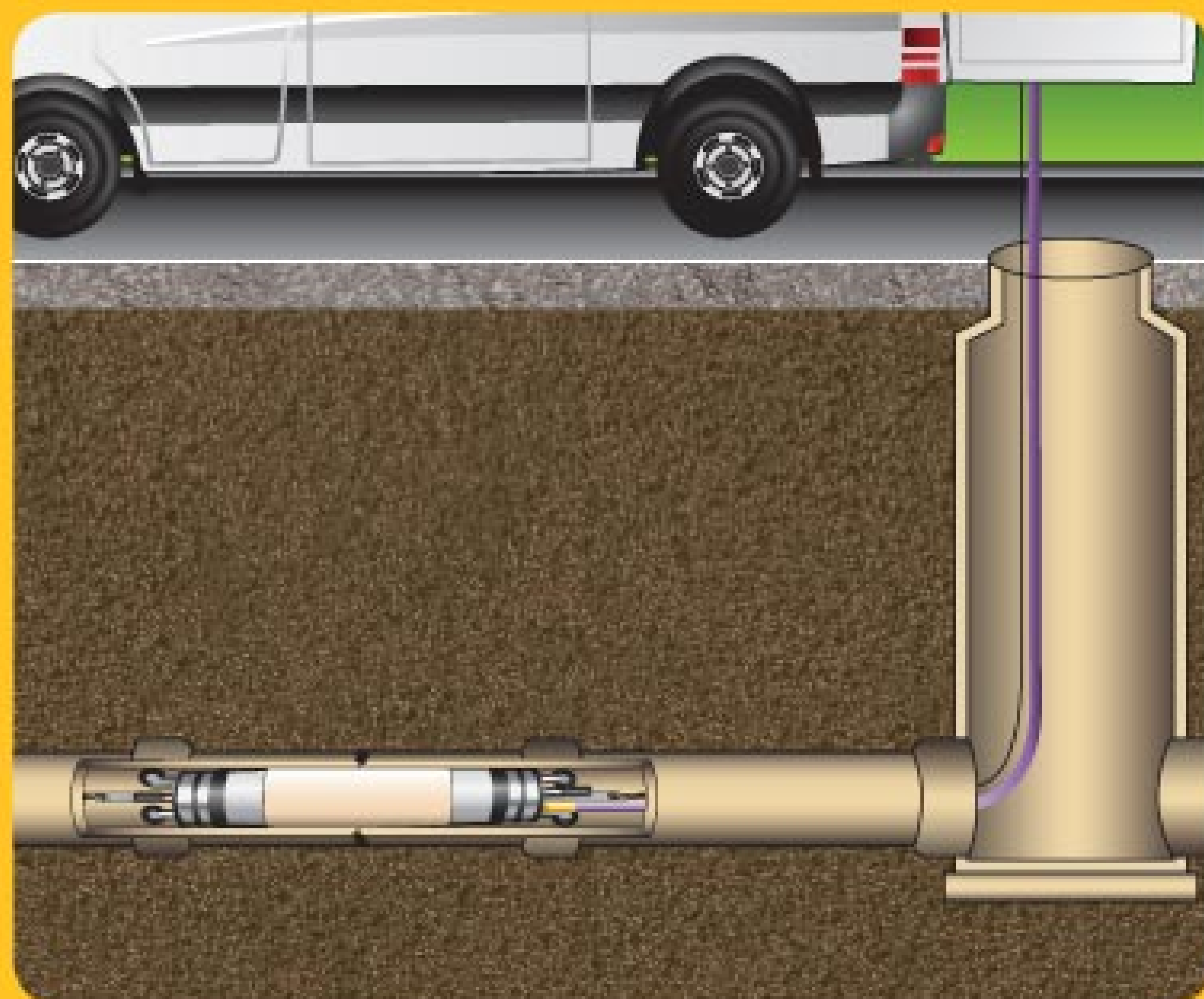
Employees talk to me about managers, and managers talk to me about employees, so I see all sides of the issue. It's amazing to me that of all the things we complain about in the workplace, we don't mention them to the one person who really needs to hear it."

Managers must care about their people, and that includes develop-

ing them, spending time with them, and figuring out what makes them perform best. That builds a solid basis for trust. "Don't just give them work and say, 'See you later,'" Krantz Taylor says. "With everyone as busy as they are, it happens often enough, but if employees trust you, they'll tell you everything you need to know." ♦



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PEOPLE / AWARDS

Sonia Maassel Jacobsen, a hydraulic engineer with the USDA Natural Resources Conservation Service in St. Paul, Minn., has been elected president of the American Society of Agricultural and Biological Engineers for 2011-12.

The **Spring Lake (Fla.) Improvement District Water Utilities Department** received the Public Water System of the Year Award from the Florida Rural Water Association.

The **National Rural Water Association** announced award recipients:

- West Virginia Rural Water Association, Association of the Year
- Fred Shelton, president, Man of the Year
- Gary Rhoades and Travey Hunter of Evergreen Rural Water of Washington, President's Award
- Ken Blomberg of Wisconsin Rural Water Association, President's Award
- California Rural Water Association, President's Award

The **National Rural Water Association** announced members elected to its board of directors for the 2010-12 term:

- Joe Liles of Kentucky, president
- Doug Anderton of Georgia, senior vice president
- Charles Hilton of South Carolina, vice president
- Mel Aust of California, secretary
- Steve Fletcher of Illinois, treasurer
- David Baird of Delaware
- Steve Wear of Arkansas
- Paul Whittemore of New Hampshire

Municipal Sewer & Water invites your association to post notices and news items in this column. Send contributions to editor@mswmag.com.

Check Out MUNICIPAL SEWER & WATER's Website

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CALENDAR

Dec. 1-3

Florida Stormwater Association Winter Conference, Hyatt Regency, Tampa. Visit www.florida-stormwater.org.

Jan. 18-21

National Utility Contractors Association's Utility Construction EXPO 2011: The Executive Experience, Las Croabas, Puerto Rico. Visit www.nuca.com.

March 2-5

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

LEARNING OPPORTUNITIES

APWA

The American Public Works Association is offering these audio/Web broadcast courses:

- Dec. 7 – How to Write a Sustainability Action Plan
- Dec. 16 – ADA: Do You Have a Plan and Have You Updated It?

Visit www.apwa.net.

American Society of Civil Engineers

The ASCE is offering the following webinars:

- Dec. 1 – Are You Fighting Fires Instead of Managing Your Employees?
- Dec. 8 – Stormwater Management for Small Sites
- Dec. 15 – Holding Productive Meetings to Increase the "Bottom Line"
- Dec. 16 – Rainwater Collection Systems and Analysis
- Jan. 11 – Interviewing Skills for an Evolving Workplace
- Jan. 13 – Bioretentional Facilities for Sustainable Stormwater Management
- Jan. 18 – If You Haven't Planned It, You Can't Control It
- Jan. 25 – Project Team and People Management
- Jan. 26 – Innovative Water Supply Strategies
- Jan. 28 – Monitoring Project Budgets and Schedules: Introduction to Earned Value Method
- Jan. 31 – Sustainable Stormwater Hydrology

Visit www.asce.org.

American Water Works Association

The AWWA is offering a Sustainability webcast on Dec. 8. Visit www.awwa.org.

Wisconsin

The University of Wisconsin Department of Engineering-Professional Development is offering a course in Madison Jan. 12-14 on Improving Public Works Construction Inspection Skills. Visit www.cpdweb.engr.wisc.edu.

The Wisconsin Department of Natural Resources is offering these courses:

- Dec. 1 – Advanced Water Treatment Strategies, Green Bay
- Dec. 7-8 – Utility Management, Madison
- Jan. 26-27 – Distribution, West Bend

Visit www.dnr.state.wi.us. ♦

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An engineering measurement which determines how much a sample will bend when a given load is applied

HOMEWORK

How will the use of Sprayroq products affect the outcome of your structural rehabilitation project?

Hint: See ASTM D790 or call 800-634-0504

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Product Spotlight

Manhole Inspection System Offers Speed, Safety, Convenience

By Ed Wodalski

The PANORAMO SI 3D optoscanner manhole inspection system from RapidView IBAK North America uses two high-resolution digital cameras with distortion-free wide-angle lenses to scan the manhole interior in a single vertical run. Like its companion horizontal pipeline scanning system, it transmits digital image data to the inspection van, where it can be viewed live or saved for later viewing and assessment at the office.

Unlike video from a pan-and-rotate camera that shows the section of the view saved at the time of filming, the system provides a 360-degree view of the manhole that can be panned and zoomed for analysis anytime, capturing 100 percent of the structure, visually and geometrically, says Matthew Sutton, vice president of sales and marketing.

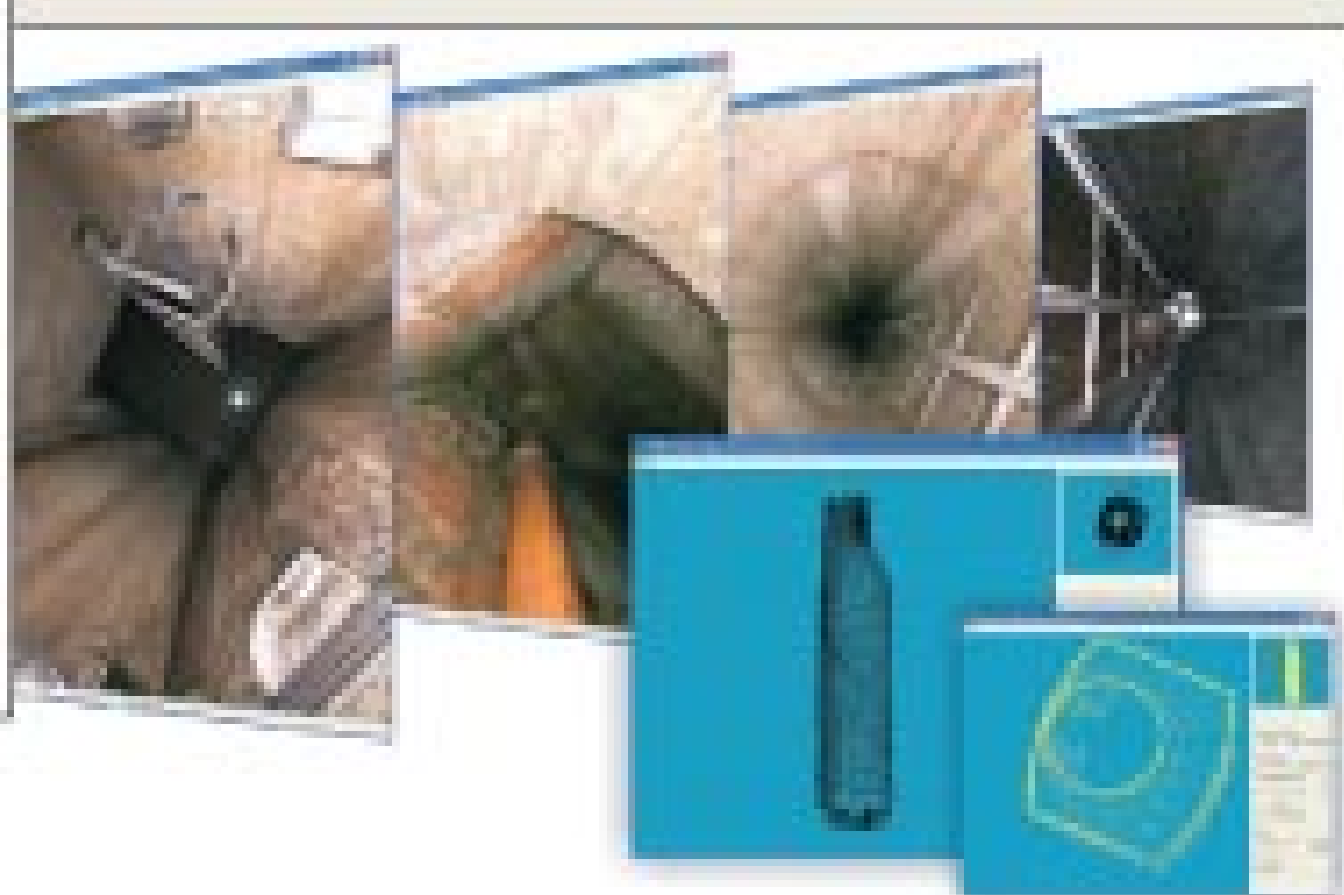
"I can look at any portion of that underground structure from any angle as though I was standing in it, no matter how deep it is, no matter how big it is," he says. "Also, during our scan, we're taking geometric measurements of the inside. So back at the office, we can measure any area of the structure. We can measure the depth of the invert. We can measure the diameters of the pipes that are coming into the manhole. And we can do that in three-dimensional space and export it to a CAD program for an engineer, if required."

Designed for manholes 16 inches to 10 feet in diameter, the system can inspect structures up to 300 feet deep. During inspection, the system takes a series of digital still images that are stitched together to form a 360-degree view. Additional images include an unfolded view for measuring observations on the wall of the structure and a geometric view that allows precise internal measurement of the structure's geometry.

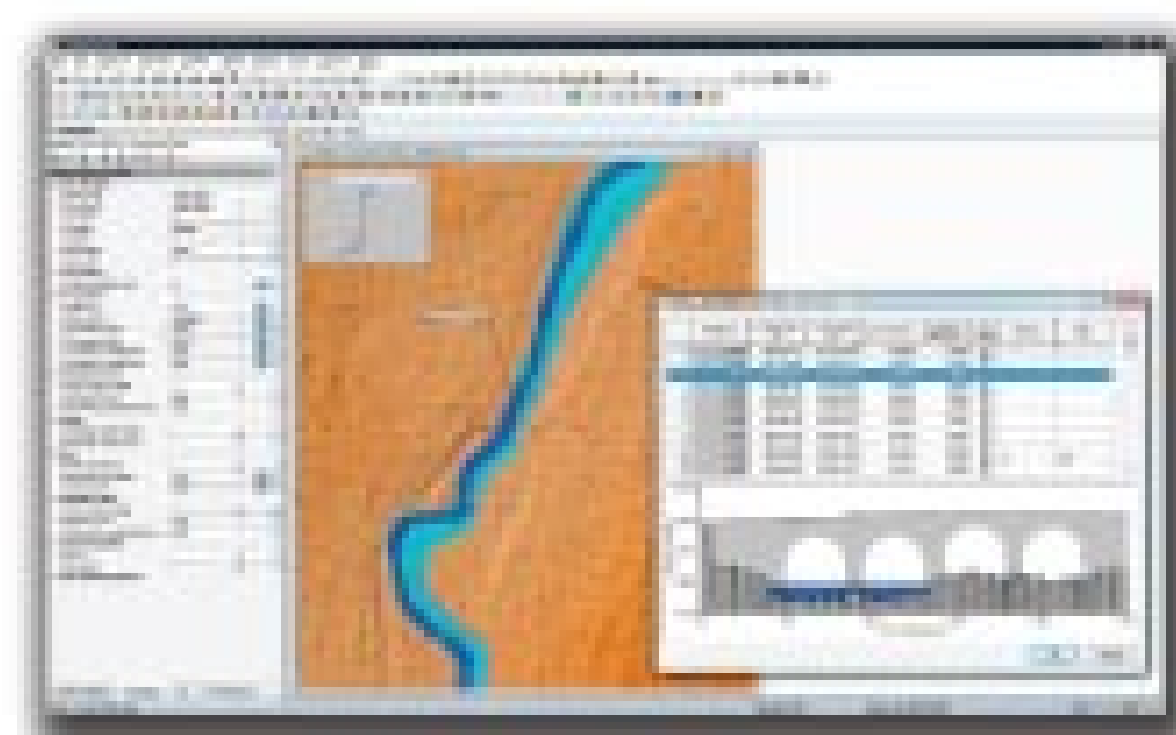
Sutton compares the process to Google Street View, which enables users to zoom in on a particular intersection. "We're doing in essence the same thing, but we're doing it every two inches," he says. A manhole can be scanned in about five minutes, enabling a team to inspect 50 to 70 manholes a day.

"The system is incredibly fast because we don't have to stop," Sutton says. "With a manned inspection, you climb in and take measurements or point a camera at something. And with a pole camera you stick the camera down and work it around, looking at features you're trying to find and focusing on things you find observable. But with our system, all you do is lower it down to the bottom of the manhole, turn it on and pull it to the top. So it's safer because you spend less time over the manhole in the street."

In addition to speed and safety, the inspection system lets users review files at the office, rather than in the field, and re-inspect files at any time. "A city would make the inspection, look at the file, and make their manhole inspection report," Sutton says. "If they had questions, they could transfer the file to their engineering firm or a rehabilitation firm, and they could look at the file, inspect the manhole and make the appropriate recommendations." 800/656-4225 or visit www.rapidview.com.



PANORAMO SI 3D
from RapidView IBAK
North America



MWH Soft Releases InfoWorks ICM V1.1

InfoWorks ICM Generation V1.1 management modeling software from MWH Soft enables users to model belowground collection systems and aboveground drainage in one simulation package. The program can model manholes, pipes, inlets, natural and man-made channels. 626/568-6868; www.mwhsoft.com.

Giant Industries Introduces GP7500 Series Pumps

GP7500 Series high-pressure pumps from Giant Industries features an integrated gear-end cooling system for maximum longevity. The 100 hp,



continuous-duty pumps are capable of flows up to 85 gpm and pressure to 3,000 psi. They are available in solid crankshaft design, gearbox with pinion shaft and gearbox with hollow shaft hydraulic drive. Standard components include solid ceramic plungers, nitrile seals with fabric reinforcing and stainless steel valves. 419/531-4600; www.giantpumps.com.

RIDGID Introduces Digital Recording Monitor

The CS1000 digital recording monitor from RIDGID is compatible with all SeeSnake reels and includes an upgraded LCDPak and keyboard with built-in recording and reporting capabilities. The system also comes with SeeSnake HQ software for job sharing, reporting and uploads to RIDGIDConnect. The lightweight, battery-powered monitor has a 12.1-inch screen with



enhanced daylight readability. The unit has three recording modes: digital stills, full-frame video and auto-recording. The report writer enables the operator to generate a full report on site with integrated inspection footage and descriptions. **800/769-7743; www.ridgid.com.**



Victaulic Introduces Reinforced Plastic Pipe Coupling

The Style 296A coupling for fiberglass-reinforced plastic pipe from Victaulic is designed for pressures up to 150 psi. The coupling engages into grooved built-up FRP pipe ends and can be installed anywhere in any weather condition. It requires no cure time, pipe flow inspection or heating blankets. The coupling, available in 1- to 12-inch sizes, can be removed for access and replaced once maintenance is complete. The coupling has an aluminum housing; anodized, epoxy-coated or powder-coated housings are available. FlushSeal gaskets are available in Grade E EPDM, Grade S Nitrile or Grade D Fluoroelastomer. **612/392-7618; www.victaulic.com.**

Advanced Waste Introduces VacSimizer Vacuum System

The VacSimizer high solid liquids collection, transportation and dumping vacuum system from Advanced Waste Services is designed to have the cargo capacity of a 5,000-gallon semi-tanker yet retain the maneuverability of a straight vacuum truck. The unit is built on a sliding subframe that allows the axles to be retracted for better mobility. The 80,000-pound GVW vehicle can haul 42,000 pounds. Features include one-switch blower operation, short-turn radius and 200 feet of 4-inch hose. The truck can be operated by a single worker, loaded from either side, has dual 25-foot hose trays and a 76-degree tipping angle with full opening rear door. **800/842-9792; www.advancedwasteservices.com.**



ADS Introduces StormTech DC-780 Chamber

The StormTech DC-780 chamber from Advanced Drainage Systems Inc. is designed for deep cover underground commercial and municipal stormwater management systems, and meets the design requirements of ASTM F 2787 and the product requirements of ASTM F 2418. The chamber offers 46 cubic feet of storage capacity and can be used in systems requiring up to 12 feet of cover. **800/733-7473; www.ads-pipe.com.**

Highland Tank Offers Manual Oil Interceptors

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Radiodetection Offers RD7000, RD8000 Locators

Lightweight RD7000 and RD8000 locators from Radiodetection feature a high-contrast, backlit LCD screen for viewing in any light condition. Both locators also feature the Centros measurement engine and eCAL validation with Centros Manager that lets users manage the locators' receivers from a desktop or laptop computer. iLOC linking enables the operator to control the transmitter remotely, while SurveyCERT enables the operator to pass survey information to third-party applications for audit or analysis on a PC or PDA. **877/247-3797; www.radiodetection.com.**



Tnemec Introduces Ceramic Epoxy Lining

Series 431 Perma-Shield PL ceramic epoxy lining from Tnemec Company Inc. is designed to protect carbon steel and ductile iron pipe used to transport wastewater. The 100 percent solids, ceramic-modified polyamine epoxy, applied at 40 to 50 mils dry film thickness, provides a barrier to hydrogen sulfide and other sewer gases. **800/863-6321; www.tnemec.com.**

Lowell Introduces Valve-Key Socket Kit

Valve-key sockets from Lowell Corp. are designed for use on valve nuts that have become rounded or corroded. Each kit includes three valve-key sockets and hardware for connecting each socket to a valve key. All sockets are made of zinc-plated, hardened steel and feature a high-visibility yellow color for easy locating. **800/456-9355; www.lowellcorp.com.**



CUES Introduces K2 Inspection System

The K2 portable inspection system from CUES Inc. can be mounted in vehicles, trailers or used as a stand-alone unit. The system features wireless control of all cameras, transporter and reel functions, and can be used with the Steerable Pipe Ranger or Mudmaster transporters to traverse long distances and tough pipe conditions. The system also can be configured with a 1,200-foot, high-strength video cable and auto-payout to operate pan-and-tilt/zoom cameras and transporters. Truck-mounted systems are available with 2,000- to 4,000-foot cable. **800/327-7791; www.cuesinc.com.** ♦



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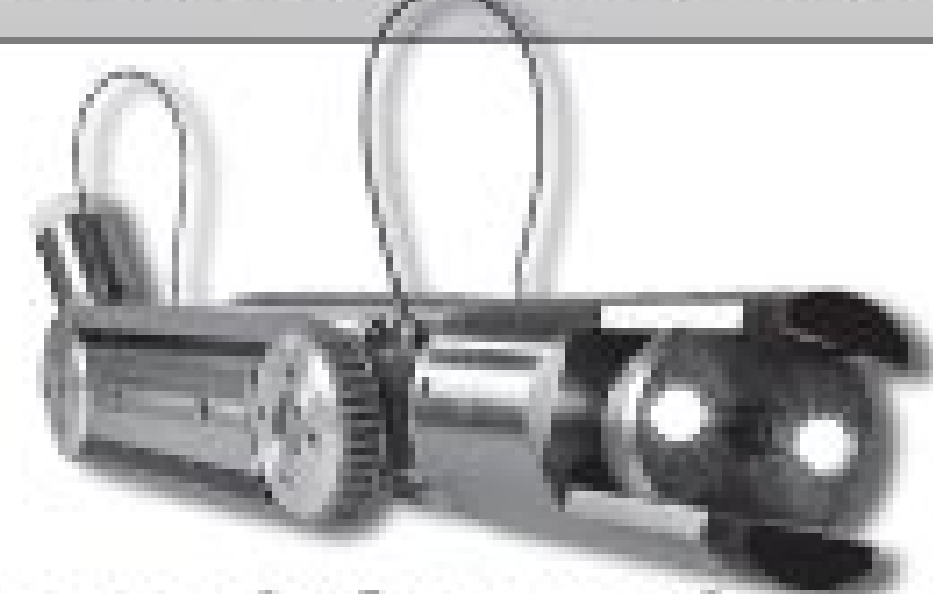
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