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IN SACO, MAINE

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THE LATEST IN INNOVATIONS
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KEEPING THE GULF STREAM CLEAN

PAGE 16

Boynton Beach stormwater
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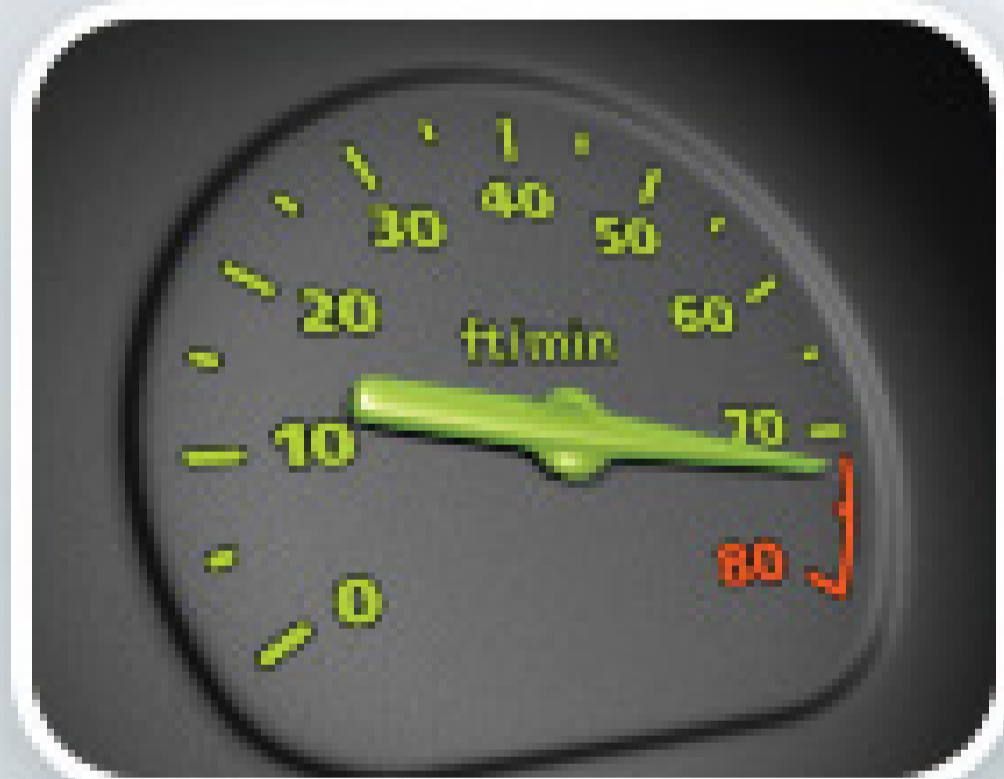
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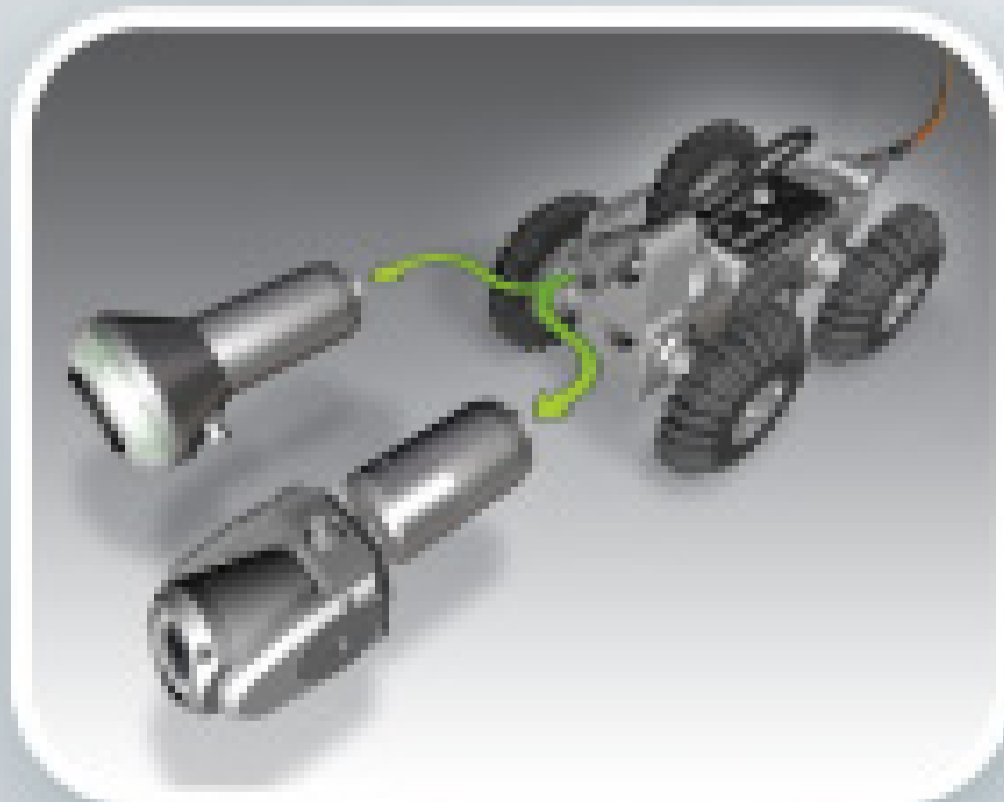
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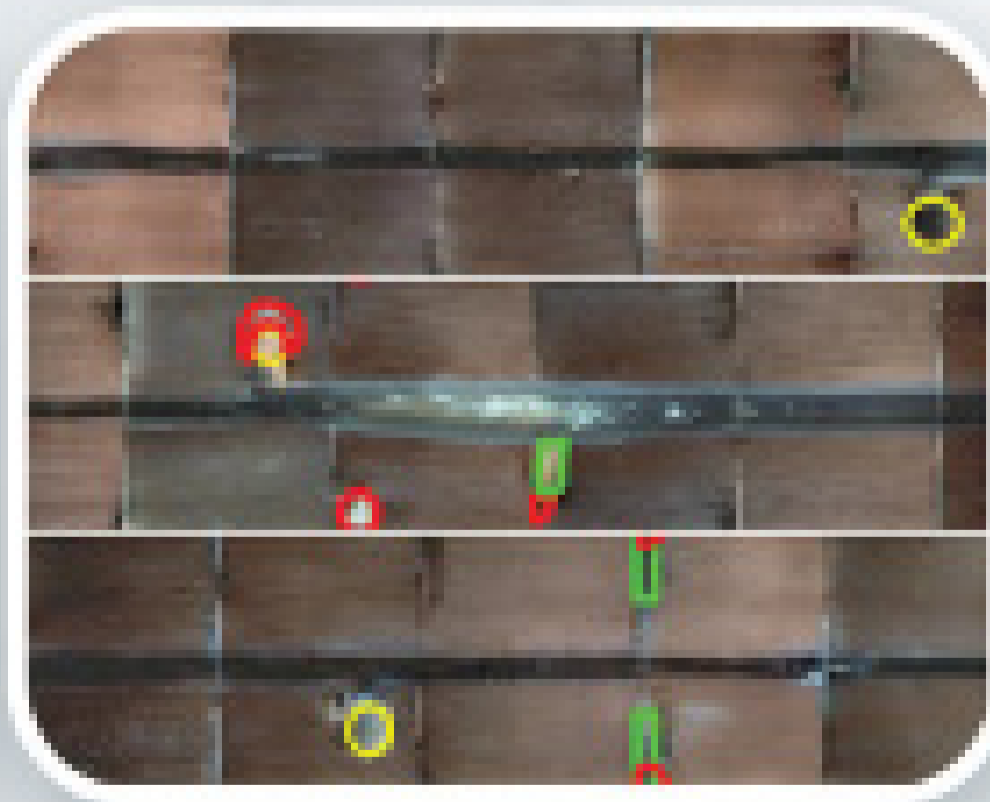
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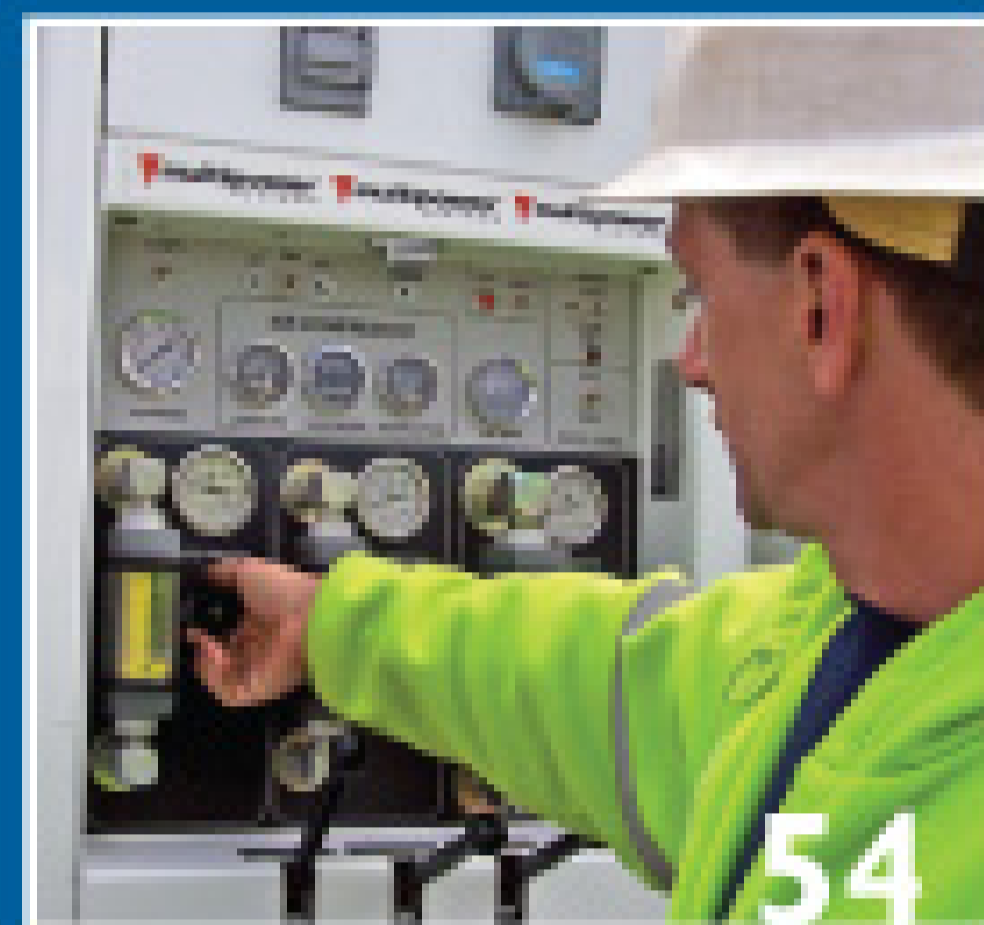
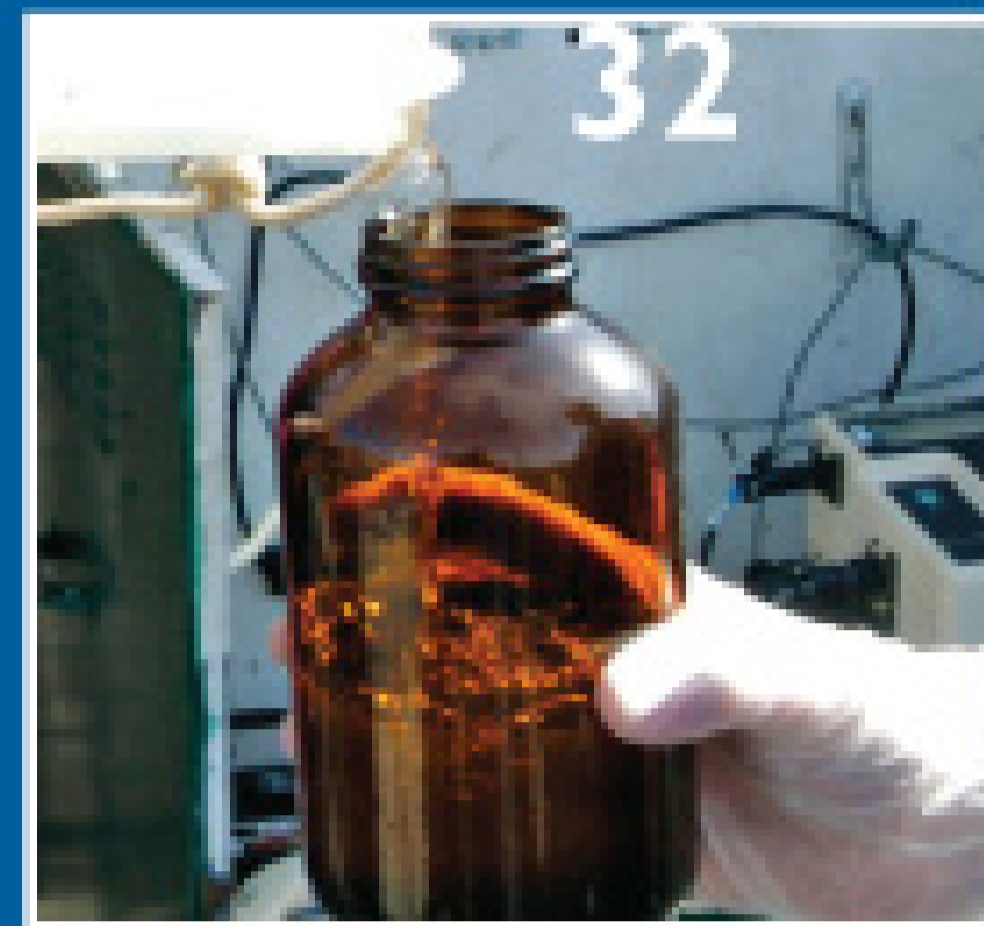
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INSIDE:

FLOW CONTROL AND MONITORING;
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COVER:

Filtration of stormwater at key points helps the City of Boynton Beach (Fla.) Utilities Department keep debris and pollutants out of sensitive waterways. Here, Paul M. Fleming, PMP senior project manager (left) talks over the maintenance plan with crew member Arthur Clark (center) and heavy equipment operator Paul Latone. (Photo by Gina Fontana)



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Special Issue: Flow Control and Monitoring/Dewatering/Treatment

- ◆ Water: GIS mapping in Manhattan, Kan.
- ◆ Sewer: Home-grown GPS in Toms River Township, N.J.
- ◆ Storm: System mapping in Newport News, Va.
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MAY 2008

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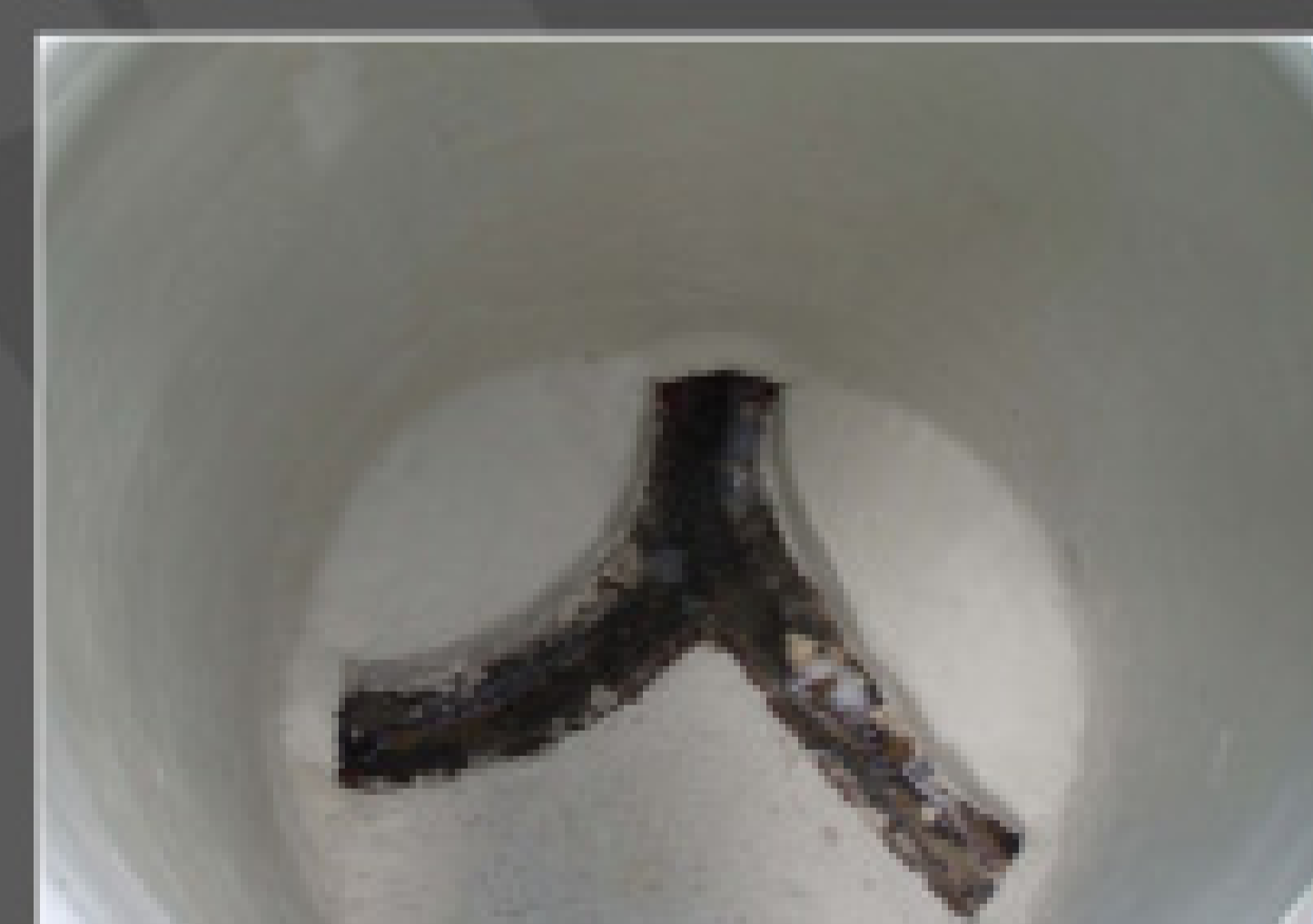
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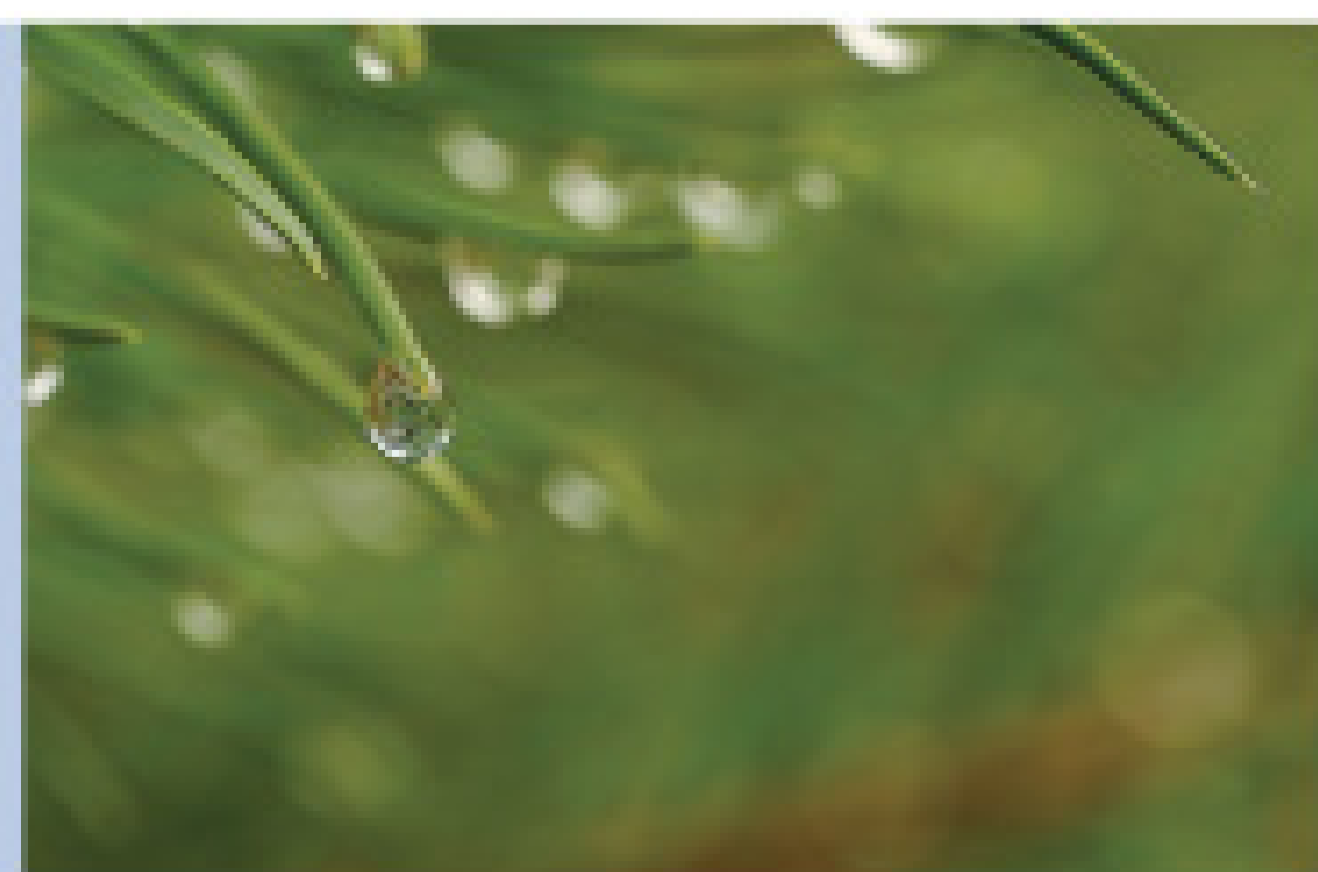


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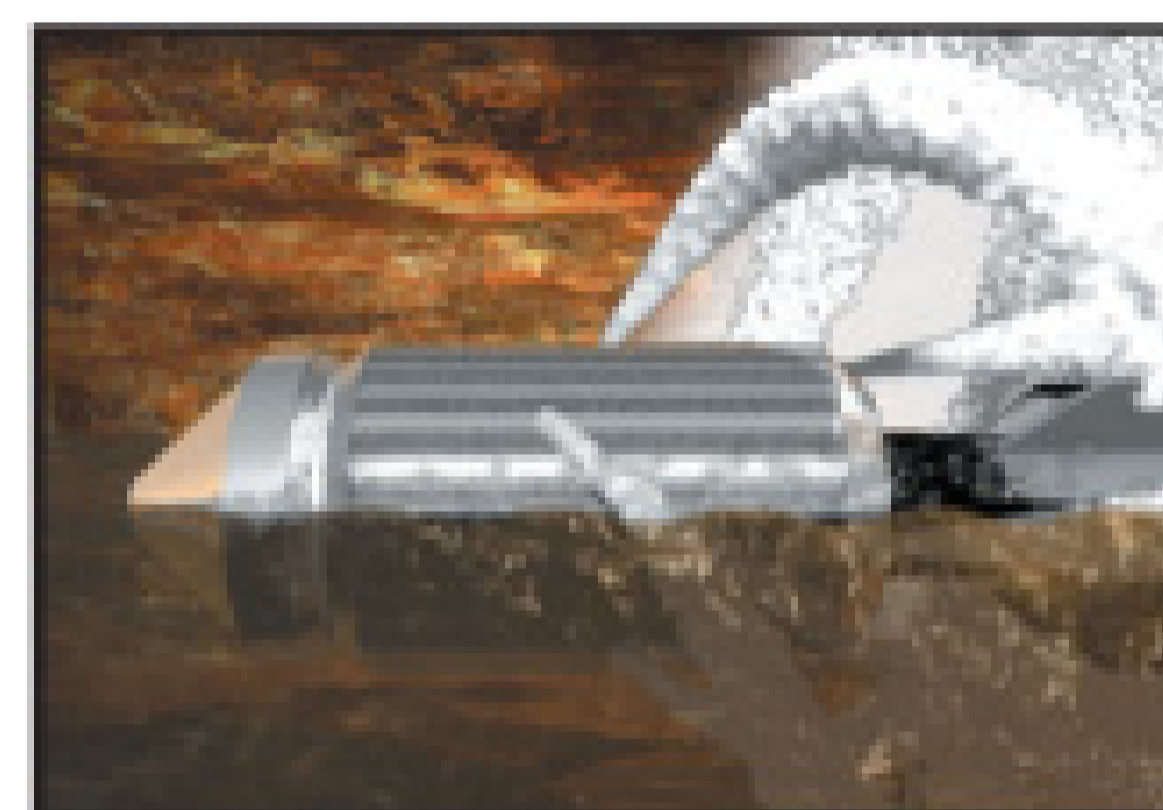


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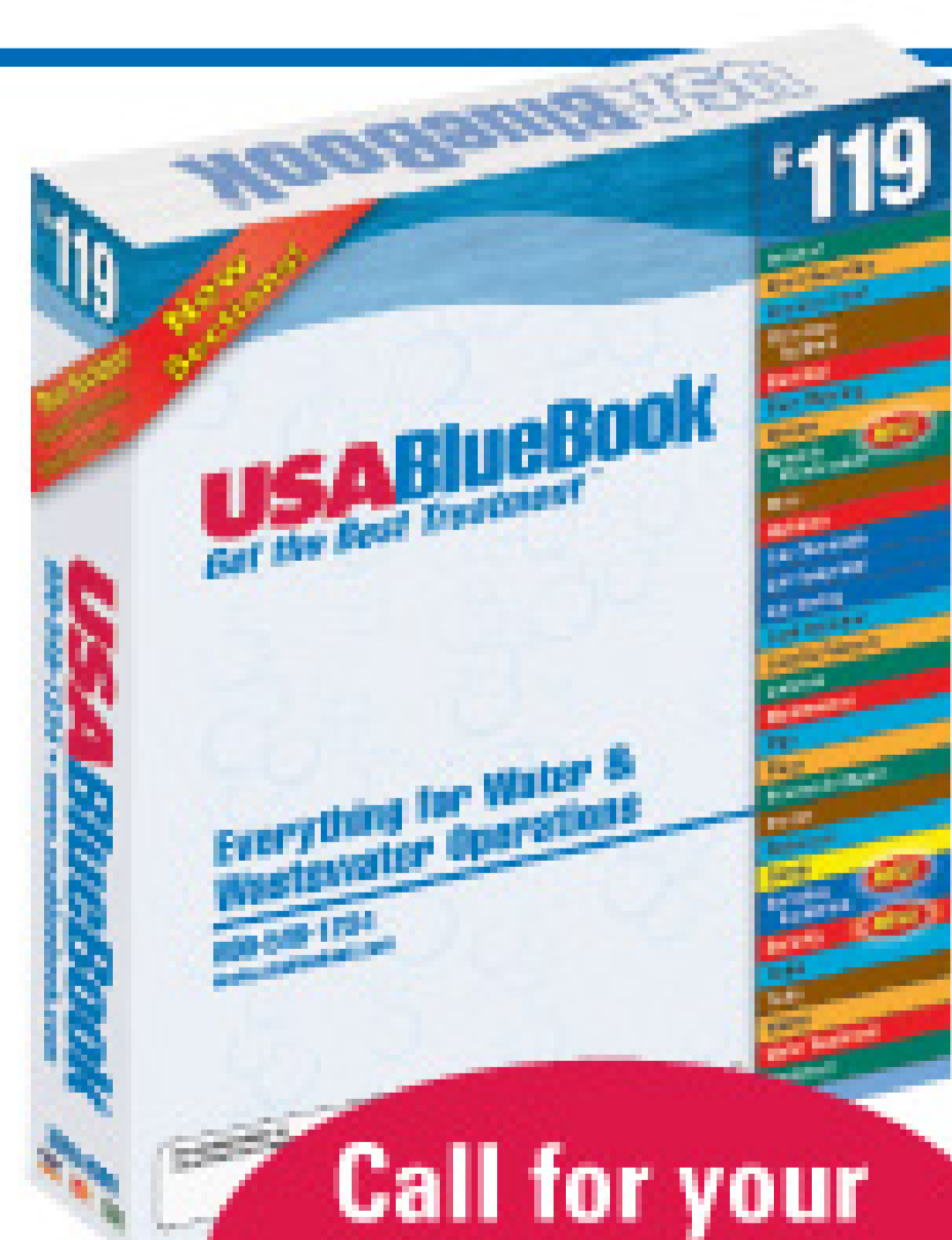


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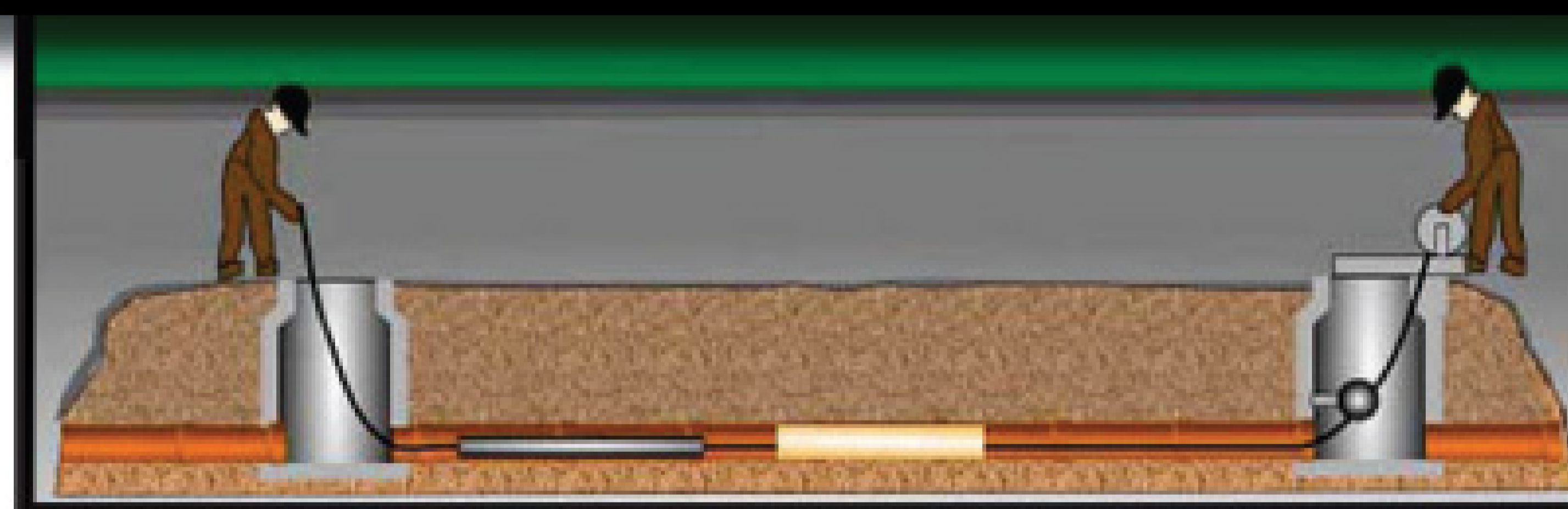
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WHERE DOES THE MONEY GO?

As the need for infrastructure revival comes to the fore, it is time to revisit the often repeated claim that taxes “take money out of the economy”

I recently heard an AM radio talk show host ranting about how one political party wants to raise taxes and how terrible it would be, amid fears of a recession, to “take all that money out of the economy.”

Indeed, in some circles, it seems an accepted, immutable fact that taxes “take money out of the economy.” But do they? Taxes take money out of people’s pockets — yes. More taxes mean families have fewer choices about what to do with the money they earn — true enough.

But do taxes “take money out of the economy”? They most certainly do not. Before we examine that idea, a disclaimer: No one with any sense advocates wasteful government spending or the raising of taxes on a whim. The ability to tax is an awesome power that every government agency must treat with the utmost respect and restraint.

That said, in a time when our public sewer and water infrastructure badly needs major investments, it is essential to debunk the idea that taxes drain the economy.

Check the numbers

No less than the Associated General Contractors of America recently did some serious debunking. A February press release from AGC said the administration had put forward a \$3.1 trillion proposed budget for fiscal year 2009 that would shrink domestic spending and reduce infrastructure investment by 2.9 percent below the 2008 level.

“At a time when we’re looking for ways to stimulate the economy, cutting infrastructure spending is short-sighted,” said Stephen E. Sandherr, AGC chief executive officer. “This budget does not help to promote job growth and protection in a declining economy. Over the last year there has been a 2.1 percent decline in nonresidential construction employment, which translates into 21,000 lost jobs.”

What’s this? The largest and oldest national

construction trade association, representing 33,000 (presumably overtaxed) private businesses, believes that public spending — supported by taxes — stimulates rather than drains the economy? Surely this is some kind of misprint.

(Or maybe AGC believes, as many in the anti-tax camp seem to, that we should simply spend this money on the infrastructure, but not tax people to cover it.)

Follow the money

What is it with this heretical claim that public spending is good for the economy? Isn’t this against everything Grover Norquist, Rush Limbaugh, Sean Hannity and other high priests have taught us?

Yes it is, but a closer look tells us the AGC is right. Where do tax dollars spent on infrastruc-



FROM THE EDITOR

Ted J. Rulseh

ture go? To essentially the same place that tax dollars spent on teachers and city and utility employees go: into the checking accounts of hardworking people. And with a great deal of efficiency, too.

People who work for municipal agencies, and the contractors who serve them, generally have good-paying, family-supporting jobs with full benefits. Collectively, they have considerable economic muscle.

It also turns out that public agencies and businesses working on infrastructure spend money on materials and equipment overwhelmingly produced right here at home — again by people who generally have good-paying jobs and have money to buy all manner of goods and services. So that money stays within local economies for a long time.

PHOTOS AND SAFETY

Cover photo,
March 2008

Municipal Sewer & Water has received a number of comments and questions about whether the workers shown on our March cover were using proper trench safety practices. We appreciate the concern for safety, and we review our photos carefully for safety violations and questionable practices before we approve them. Several staff members review photos and reject those that show poor practices.

We approved the March cover based on OSHA regulations for safe excavation. Those regulations state that excavations less than five feet deep do not require protective systems. In this instance, the worker in the trench is on his knees, and the trench appears to be roughly at head level. It thus appears that the trench is about three or four feet deep.

In addition, as the photo caption stated, the crew had a shoring box on site, but chose not to use it. This indicates that they duly considered the safety of the workers given the nature of the work and the site conditions. The shallow depth of the trench, the fact that the ground was frozen, and the crew’s considered decision not to use shoring, gave us confidence that the picture showed a safe situation.

We will continue to do our best to promote safety in workplaces, and we encourage readers to submit comments and suggestions related to safety.

—Ted J. Rulseh



Yet the focus of the federal government's economic stimulus package (essentially \$150 billion or so of borrowed money) is to give rebate checks that people can spend on flat-panel TVs, discount store appliances, and other goods made mostly overseas.

I know, I know

Now, I am not saying it's bad for people to have choices on where to spend the money they earn (or get back from the government). And I'm not saying every tax for a public infrastructure investment is good (think Bridge to Nowhere and other pork).

But we need to let go of this idea that public investment and taxes "take money out of the economy." In fact, at a time when our vital infrastructure needs many billions of dollars in investment, and the economy needs a jump-start, it only makes sense to think of infrastructure work as part of an economic stimulus program.

We also need to let go of the well-entrenched idea that we should hate paying taxes. Arguably, that attitude is what got us into this anti-tax era in the first place.

We need to remember that we live in a representative democracy and that every tax we pay

sewers, water systems, streets, highways and bridges no more than we resent paying for mortgages, gasoline, clothing, and groceries. We can of course resent public officials who spend our money unwisely, or better still, vote for other candidates the next time.

But where infrastructure is concerned, let's recognize not only that we need it for quality of life but that spending on it employs people — our fellow community residents, friends, neighbors, and even family members.

Taxes do not "take money out of the economy." Like department stores, factories, car dealerships and doctor offices, public agencies and the taxes that support them are a part of the economy, and a productive part at that. ♦

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

**Where do tax dollars spent on infrastructure go?
To essentially the same place that tax dollars spent
on teachers and city and utility employees go:
Into the checking accounts of hardworking
people. And with a great deal of efficiency, too.**

was voted for in public by people we elected to office (or did if we bothered to vote). Those taxes, to the extent that government is efficient (and at the state and local level where most infrastructure is built, it is quite efficient) go to pay for necessities.

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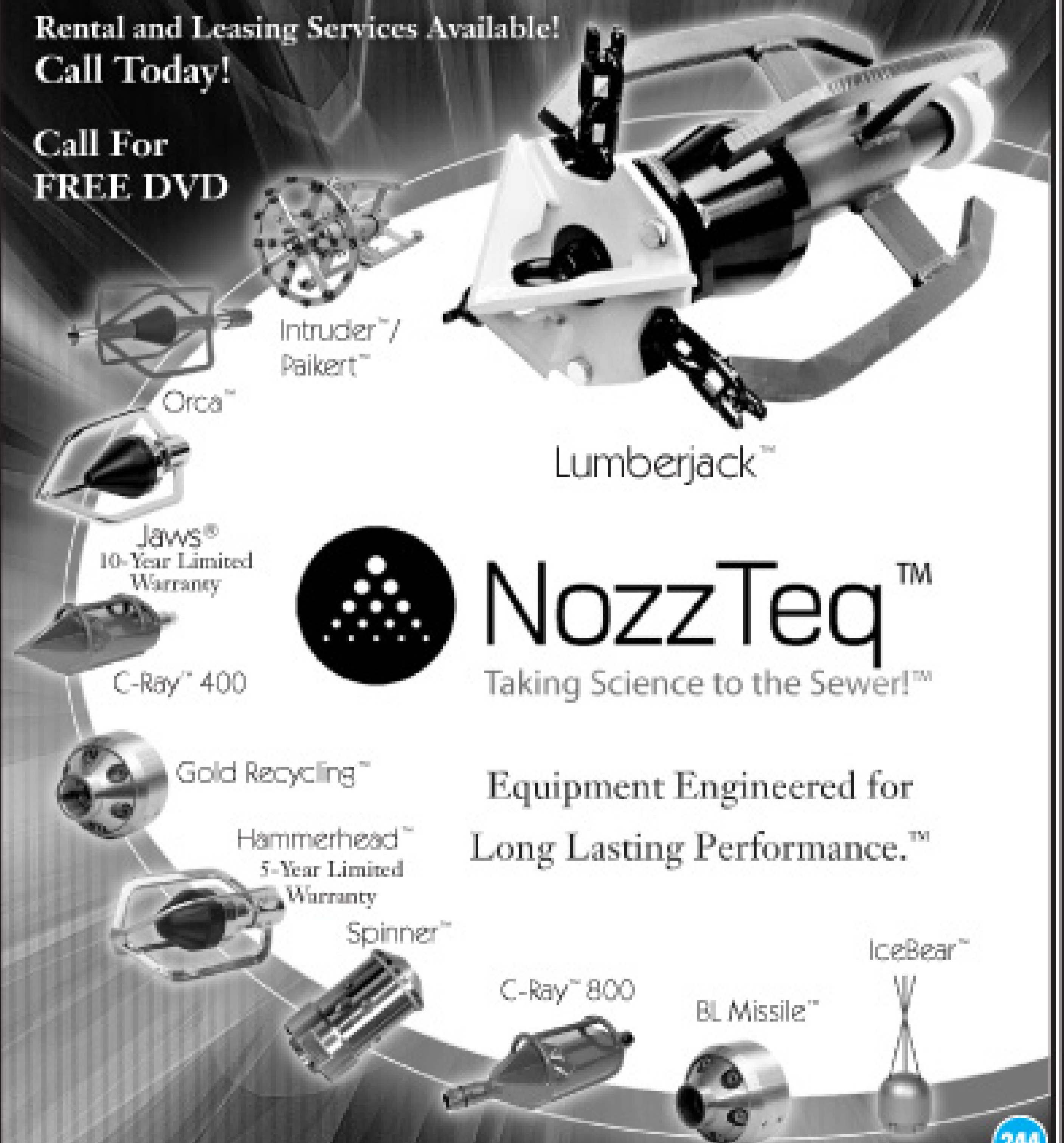
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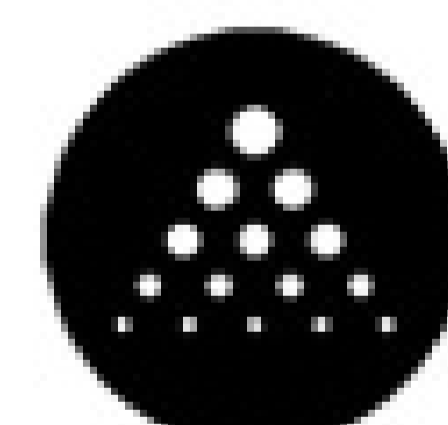


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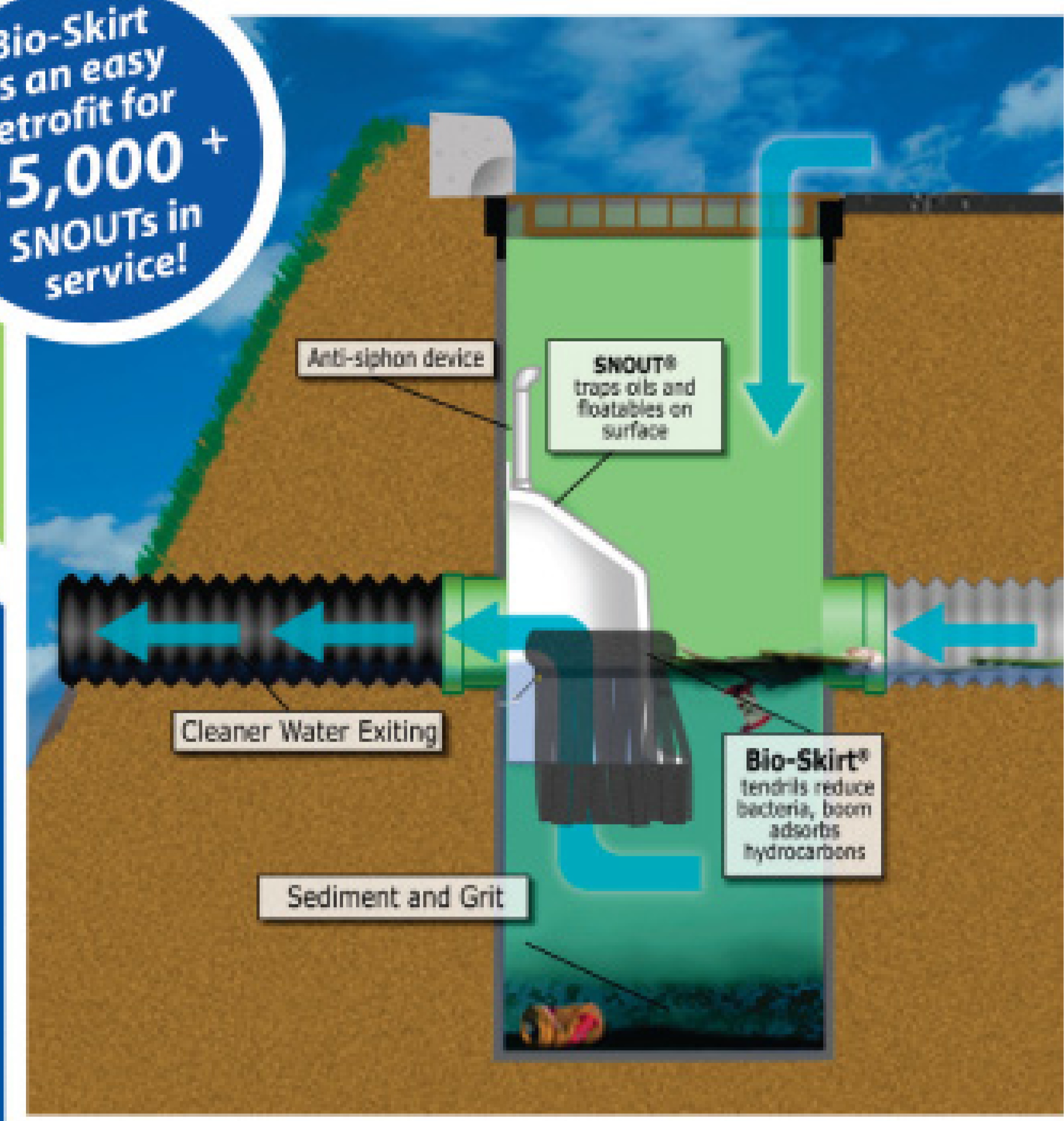
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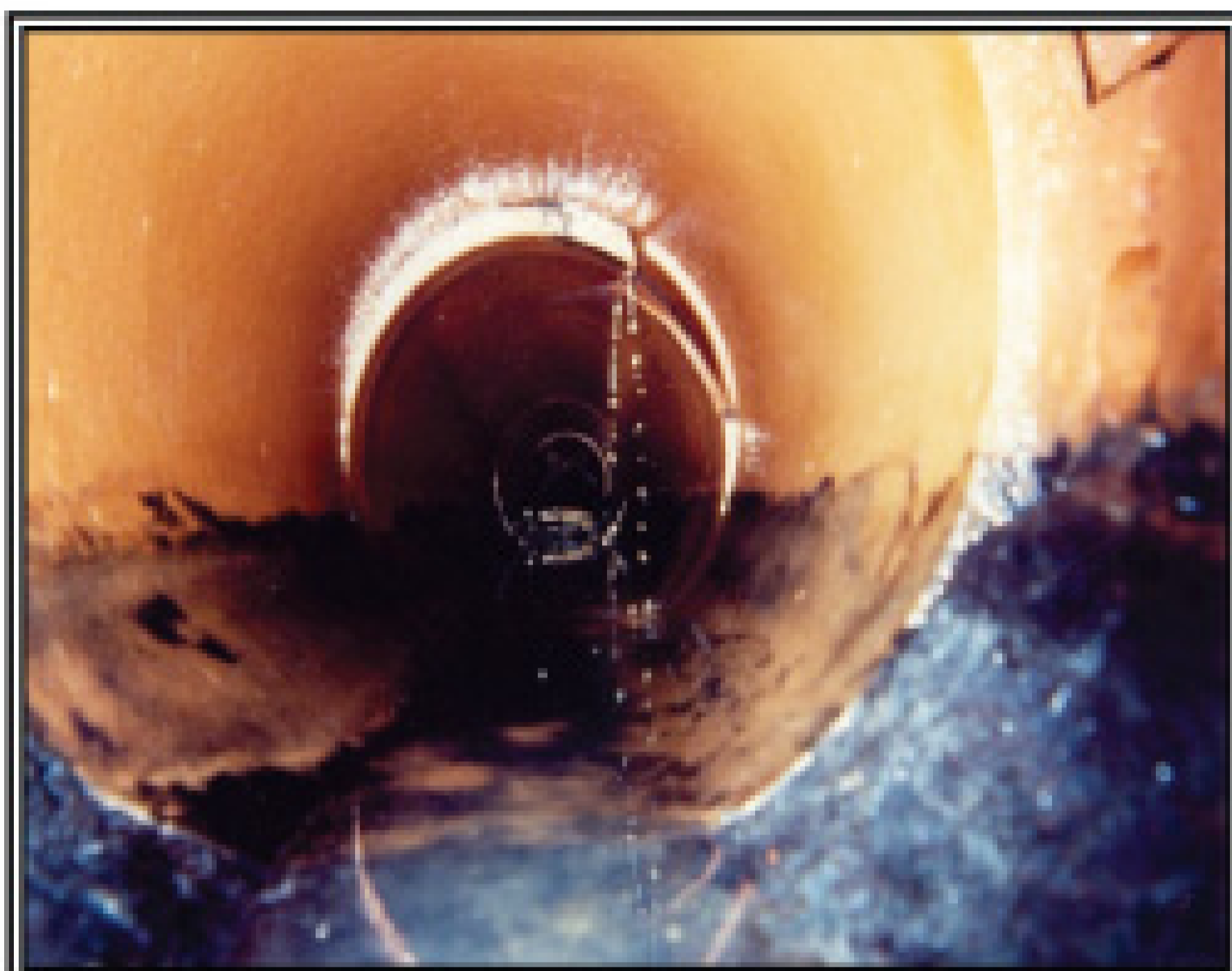
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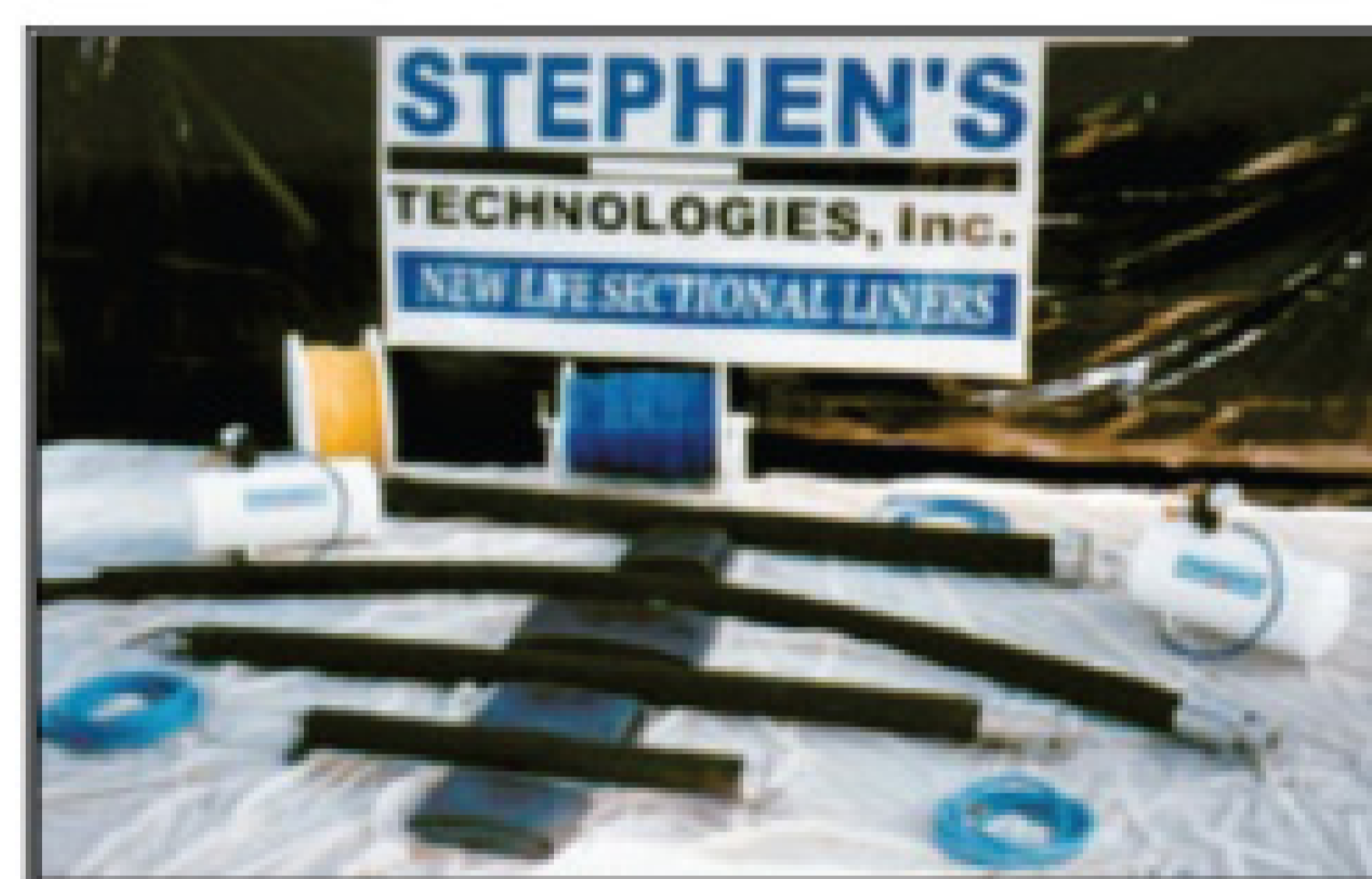
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KEEPING THE GULF STREAM CLEAN

A comprehensive stormwater program in the City of Boynton Beach, Fla., includes passive debris filters that stop debris and pollutants at entry points

By Dan Heim



Crew member Brandon Mingo and heavy equipment operator Paul Latone work on Boynton Beach's Railroad Avenue storm drainage project. (Photos by Gina Fontana)

EPA regulations have significantly reduced stormwater runoff pollution from industry and agriculture. The remaining battleground in many areas is urban runoff — lawns, streets, parking lots, and roofs all contribute their share of debris and pollutants, and the sheer number and variety poses a real challenge.

With more than 60 inches of annual rainfall, the City of Boynton Beach, Fla., needed a comprehensive plan to ensure stormwater quality. "The creation of a formal Stormwater Utility, supported by fees based on our customers' equivalent resi-



dential units (ERUs), has helped the city with the financial resources to do what we had to do," says Paul Fleming, PMP, senior project manager for the Boynton Beach Utilities Department's Engineering Division since 2001.

ERU fees, along with additional federal and local funds, provided the means to address the problem on several fronts. Included were upgrades to existing stormwater infrastructure, integration of a GIS mapping system, public education, and widespread installation of a simple but effective filtration device.

Fleming considers the filters one of the most important contributors to stormwater pollution reduction for Boynton Beach, on Florida's Atlantic Coast.

PROFILE:

City of Boynton Beach, Fla.,
Utilities Department

POPULATION:
65,000 city; 30,000
surrounding area

AREA SERVED:
16 square miles city; 11
square miles surrounding

ANNUAL PRECIPITATION:
61.4 inches

EMPLOYEES:
3

OPERATIONAL BUDGET:
\$26 million

WEB SITE:
www.boynton-beach.org

One part of the plan

Fleming's department serves 16 square miles in the city, plus 11 square miles of surrounding area. The city's population is 65,000, with 30,000 more people living in the outlying areas.

Besides filtration, Boynton Beach employs a range of stormwater quality improvement measures common to similar communities. As part of its stormwater quality improvement program, when other utility-related infrastructure improvements are constructed, the city also renovates decades-old swales that have become clogged or sedimented over time. Five new stormwater wet retention ponds have been constructed.

More attention is being paid to wetlands and mangrove preservation along the coast. "Many of the

Senior project manager Paul Fleming, stormwater supervisor Louis Johnson, crew leader Diane Niesolowski review the plans of the successful Railroad Avenue project.



city's older intra-coastal neighborhoods were not master planned for stormwater management," Fleming says. "As we become more aware of our urban environment, we see how we're affecting these ecosystems."

GIS was another step forward. The current system is based on the widely used ArcGIS platform by ESRI. GIS has helped significantly. "Boynton Beach is an established Florida city, and we've been playing catch-up on this," Fleming says. "We're going from sketches and

"Many of the older intra-coastal neighborhoods were not master planned for stormwater management. As we become more aware of our urban environment, we see how we're affecting these ecosystems."

Paul Fleming

memory to a proper underground utility atlas." In the near future, all that data will be migrated to the Orion GIS platform, also by ESRI, to enable more web-based functionality.

Meanwhile, stormwater filters have made a significant impact on pollutants by attacking urban runoff at its entry points. The city selected SNOUT filters, manufactured by Best Management Products Inc. (BMP) of Lyme, Conn.

Archimedes rules

Easily retrofit in existing stormwater sumps, the filters help segregate debris and pollutants from the outflow. "One of our con-



Crew workers Arthur Clark and Brandon Mingo clear a catch basin on Railroad Avenue.

sultants recommended this device, and we could see immediately it had the potential to help us comply with a significant component of our NPDES MS4 permit requirements," Fleming says.

The filters use the physics of flotation to remove debris and pollutants. Back in 250 B.C., Greek scientist Archimedes showed how objects more dense than water sink, and those less dense than water float.

When the SNOUT filter is attached over an outflow pipe in a stormwater catch basin or sump, it creates a baffle that selects outflow from the middle stratum of water. Debris and pollutants stay largely above or below that point, and they

remain in the sump for later removal.

Fleming notes that in the past, the city fabricated similar baffles onsite, using aluminum or fiberglass. "But when we looked at the costs of fabrication compared to an off-the-shelf alternative, and at the cost of maintenance, we come out ahead using the BMP product," he says. "Cost, fabrication and installation time, ease of use, adaptability, and durability all figure in."

More to come

For dissolved or suspended pollutants that make it past the barrier, an accessory, the Bio-Skirt, can be attached at the inlet. It consists of a series of synthetic fabric

A SWEET RESOURCE

Boynton Beach, "Gateway to the Gulf Stream," is near the most easterly point on the Atlantic Coast of Florida. As in other communities in the area, like Cocoa Beach and Cape Canaveral, city residents enjoy the luxury of what is commonly called "sugar sand." This fine-grained, quartz-rich sand makes for majestic beaches, and its white color makes it look like real sugar. But life on the beach is not all sweet.

Sugar sand has the unfortunate tendency to wash away quickly, leaving coarser sands behind. It suspends in the water easily, and it is only slowly replaced by natural processes. With the recent increase in hurricane activity, beaches along many parts of the coast are seeing severe erosion.

On the plus side, sugar sand makes for very permeable soil, improving the efficacy of swales, drain ponds, and stormwater leach fields. A simple perforated pipe, buried a few feet underground and surrounded by sugar sand, allows water to return quickly to the Biscayne Aquifer. The aquifer is a major source of drinking water, and it runs a mere 65 to 120 feet below the surface in the Boynton Beach area.

Stormwater strategies have taken advantage of sugar sand, using it to help with runoff control and aquifer recharging. Compared to geologic regions saddled with the constraints of rock, clay, or silt-laden soils, life in Boynton Beach, at least for stormwater engineers, can indeed be sweet.

strips impregnated with diatomaceous earth, providing catch points where bacteria and hydrocarbons are adsorbed. It continues working as long as the fabric is intact.

"It's not a catalyst, since there's no real chemical reaction occurring, but it's similar to a catalytic process in that nothing gets used up, and it keeps doing the job as long as it's there," says T.J. Mullen, BMP president. Other accessories include flow deflectors that improve settling in the sumps, and odor control filters that attach to a built-in anti-siphon vent.

The unit comes in sizes to fit



Boynnton Beach workers install a drainage structure and exfiltration trench. (Photo courtesy of City of Boynnton Beach Utilities Department)



A double jack-and-bore operation: stormwater on the right, water main on the left. (Photo courtesy of City of Boynnton Beach Utilities Department)

flow water quality equivalent to what the city achieves with filters. This helps ensure that, as urban growth continues, as it inevitably will, stormwater quality is maintained and improved.

The filter-equipped basins require periodic cleaning. Boynnton Beach has a fleet of four combination trucks, two of which are dedicated to stormwater cleanout. The others are dedicated to sanitary sewer cleaning, although Fleming's department can tap them as needed. With two trucks on a more-or-less daily cleanout schedule, the Utilities Department stays ahead of problems.

Stormwater crew members can reach down with one hand, do a quarter-turn on the access port, pop that off, insert the combination truck jet hose into the pipe, jet the sedimentation and debris back into the sump, and vac the debris out.

With filtration, Fleming is seeing a reduction of pollution and debris in stormwater outflow, as measured by visual inspection and EPA-mandated testing. "I'd like to say we have hard data on the performance, but we haven't yet quantified the impact of these units," he says. "I can't tell you how many

"I'd like to say we have hard data on the performance, but we haven't yet quantified the impact of these units. I can't tell you how many tons of debris we've removed from the drainage structure sumps, but I can say they're doing the job."

Paul Fleming

tons of debris we've removed from the drainage structure sumps, but I can say they're doing the job."

He observes that the units capture a large percentage of the floatables. In conjunction with the drainage structure sumps, a similarly large percentage of the sediment is kept out of the city's exfiltration systems.

In some high runoff areas, filters are installed in series on adjacent sumps and catch basins. Under most conditions, the downstream unit is barely taxed. Because the Southeast U.S. has been in an extended drought, the biggest tests may be yet to come.

Bigger picture

Besides taking care of stormwater in Boynnton Beach, Fleming is a member of the Florida Stormwater Association, with a seat on the Education Committee. In this capacity, he works with Chris Roschek, engineering division

manager and NPDES representative, on analytic studies of pre- and post-development runoff.

"We'll be focusing on things like bed loading; silt, dirt and debris chemistry; and particle size and distribution characteristics, to finally get some hard data on the effectiveness of the city's stormwater systems," he says. "We're firm believers in environmental stewardship, something that should be high on everyone's list.

"Both the city and utilities management are committed to doing everything we can to ensure air and water quality, working in an integrated way with agencies at the local and national level, like NPDES, EPA, the South Florida Water Management District, and the Florida Stormwater Association. This provides tremendous

benefits as we continue to develop our urban areas. And we're already seeing positive results."

The Boynnton Beach Stormwater Utility was created in the late 1990s to generate the revenue required to meet those lofty goals. Many older cities in the region do not yet have such a funding mechanism in place. Fleming and his colleagues are extremely proud of their accomplishment, and of what it has allowed them to do. Now, the city known as the "Gateway to the Gulf Stream" is helping its namesake remain a clean stream. ♦

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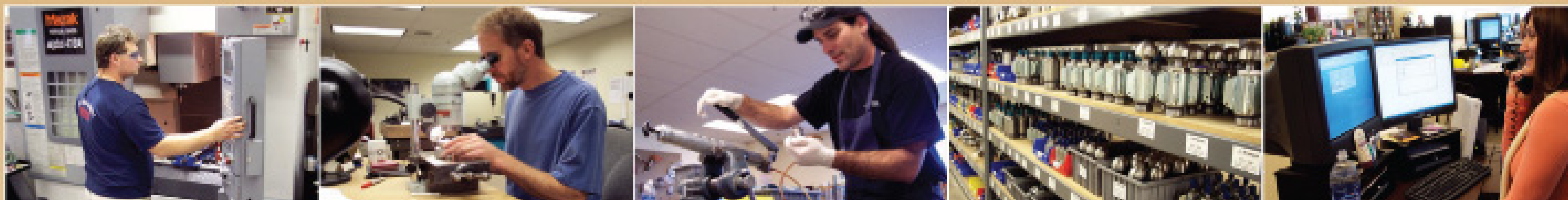
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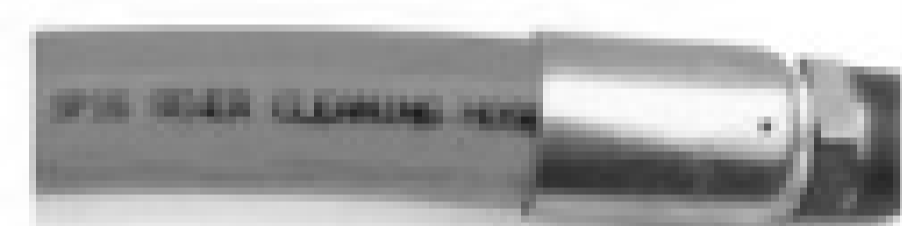
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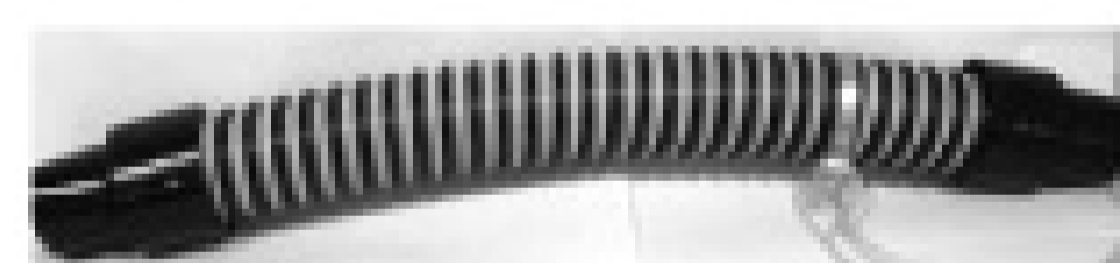
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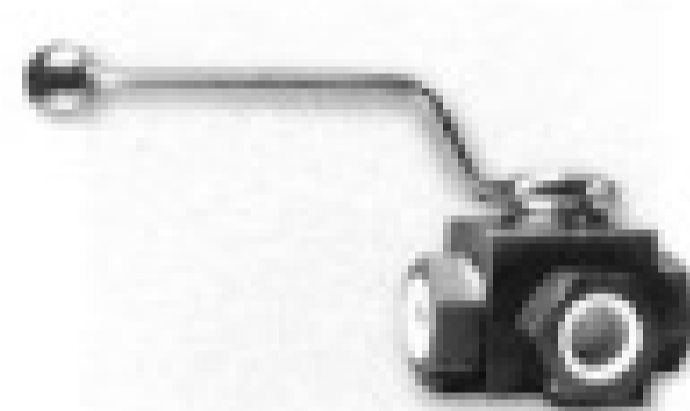
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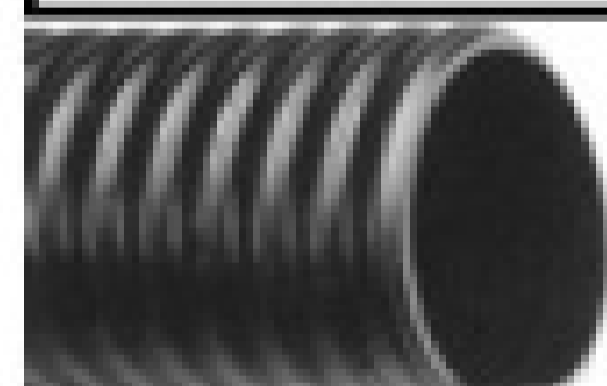


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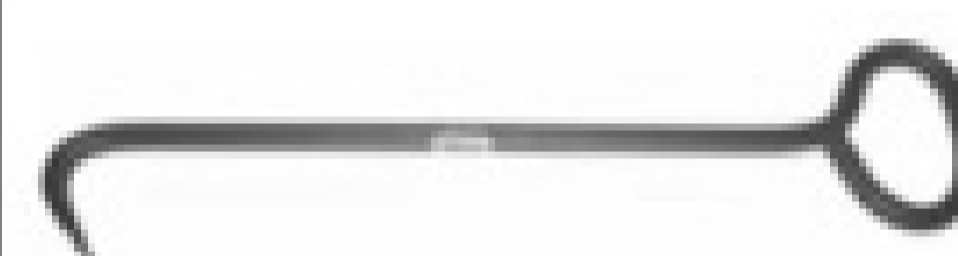
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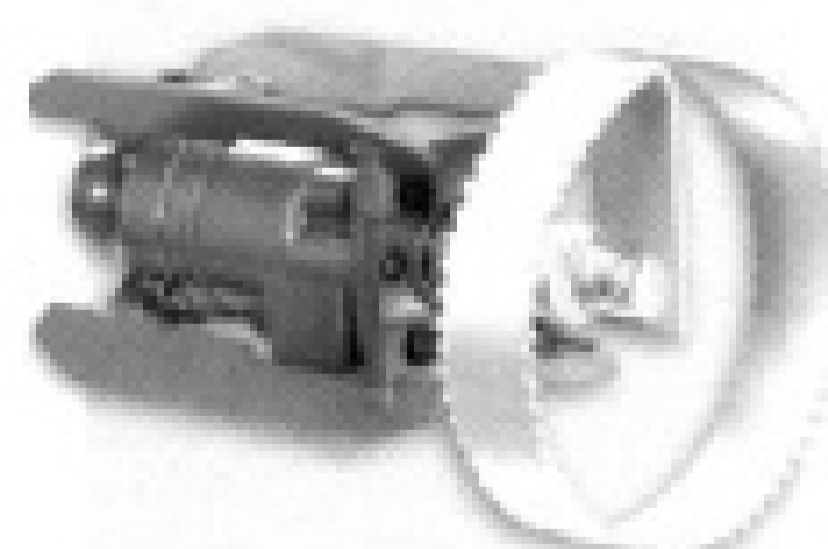
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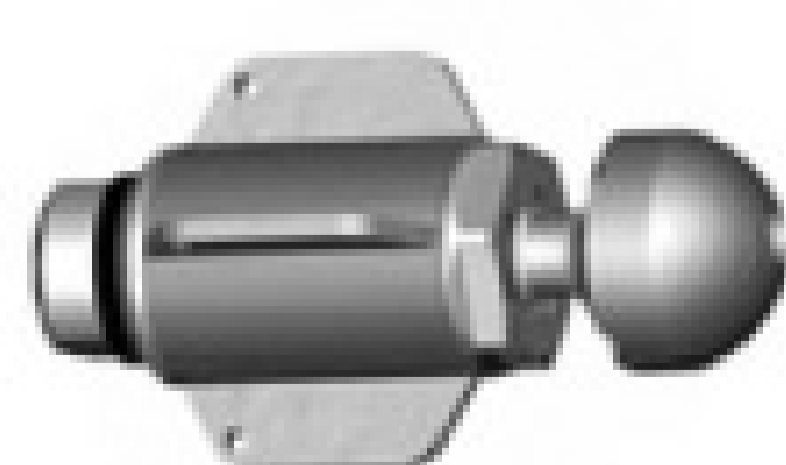
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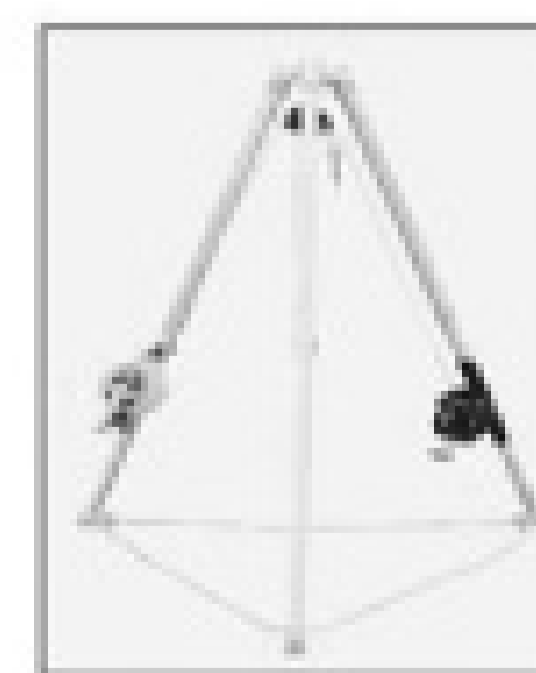
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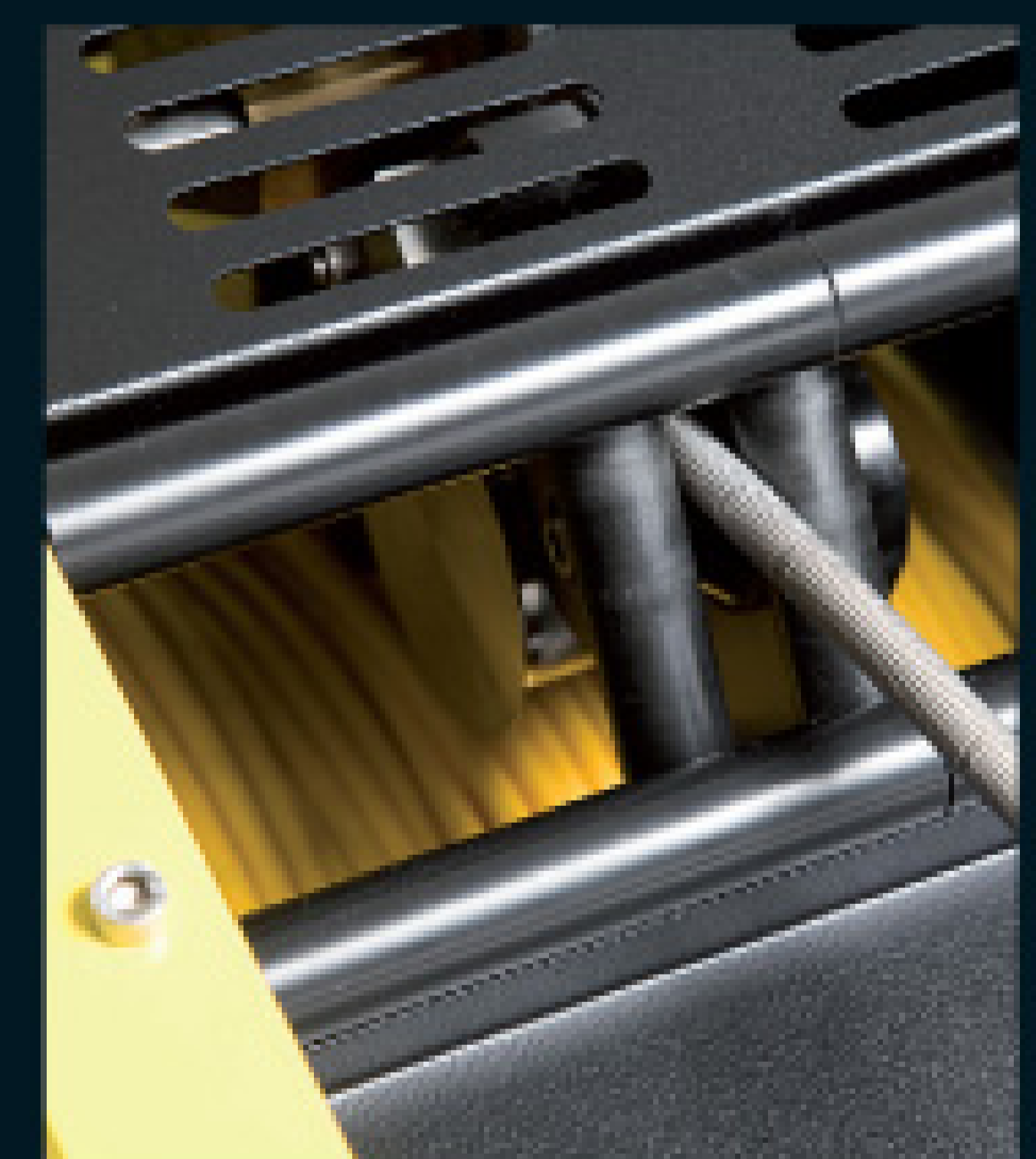
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Initial construction of the CSO Storm King. (Photo courtesy of Saco WWTP)

FOCUS: SEWER

SPINNING A SUCCESS STORY

Innovative vortex separators are part of a comprehensive CSO abatement program that pays big environmental dividends for the City of Saco, Maine

By Jim Force

By using a little Yankee ingenuity, the City of Saco, on Maine's southern coast, has made significant progress toward eliminating combined sewer overflows (CSOs).

A \$10.8 million, 20-year plan, finalized in 1994-95, incorporated a series of milestone projects including sewer separation, flow slipping, and primary treatment of combined sewage at Saco's 4.2 mgd (design) wastewater treatment plant. The city began implementing the plan in 1996 and to date has completed 98 percent of the projects.

"We're very pleased with the progress we've made toward meeting the objectives of our CSO Abatement Master Plan," says Howard Carter, deputy director of public works. Previously, the city had CSOs, as well as many older homes with roof and basement drains still connected to the sanitary sewer system. As a result, wet-weather flows often overwhelmed the treatment plant, leading to discharge of untreated stormwater and sewage into the Saco River, and threatening the area's water quality and sensitive shellfish beds.

Initially tackling the easiest

projects, the city implemented BMPs (best management practices) to help contain trash and paper products being discharged directly to the receiving waters. After getting a handle on trash and debris, the next step was to convert the existing sewer system into storm sewers only, while installing new sanitary sewer lines. The old sewer system was constructed of brick, some more than 100 years old, making the transition quite challenging.

The hard work has paid off though, and the community's Atlantic Ocean beaches and pristine Saco River continue to



PROFILE:

City of Saco
(Maine) Department
of Public Works

FOUNDED:
1867

POPULATION:
18,241

CUSTOMERS:
4,553

INFRASTRUCTURE:
59 miles of sanitary sewers

EMPLOYEES:
11 (collection systems,
treatment plant, billing)

ANNUAL BUDGET:
\$2.4 million (wastewater)

WEB SITE:
www.sacomaine.org

Lab technician Travis Peaslee checks the influent composite sampler at Saco's wastewater treatment plant. (Photos by Shawn Patrick Ouellette)



AWARD-WINNING MAINTENANCE

Comprehensive efforts to combat combined sewer flows have earned the City of Saco important recognition. In 2000, the U.S. EPA presented the city with the National First Place award for CSO program excellence.

Award-winning performance extends into other operational areas, as well. The wastewater treatment plant received the 2002 U.S. EPA Region I Operations and Maintenance Excellence Award.

In the fall of 2007, Travis Peaslee of the treatment plant staff was a member of the Force Maine team that won the Division II Operations Challenge at the Water Environment Federation's WEFTEC competition in San Diego. Saco has a long tradition of participating in the Operations Challenge, says Howard Carter, deputy director of public works. In fact, John Hart, chief operator, is a past WEF Operations Challenge committee chair and current member of the WEF House of Delegates.

"The treatment plant staff takes great pride in their jobs and what they do for the environment, and they are extremely motivated and involved," says Carter. "That makes projects such as those in the CSO control program easier to implement, knowing support and staff involvement are incorporated."

"We're very pleased with the progress we've made toward meeting the objectives of our CSO Abatement Master Plan."

Howard Carter

provide healthy recreation for citizens and visitors alike.

Different approach

During construction and implementation of the plan, the city had to make a decision about the conversion of the two main downtown sewer lines. The staff decided not to tear them up, as that would disrupt business and utilities and create traffic nightmares.

Instead, they decided to tie the influent pipes leading from these lines directly into the wastewater treatment plant by way of a larger, single 24-inch polyethylene line. Upstream of the plant, the flow in this line passes through a new diversion structure that regulates wet-weather flows with self-activating, passive flow-control valves.

These units are 22 1/2-inch and 16-inch Type C Reg-U-Flo valves, supplied by Hydro International Inc. of Portland, Maine. By harnessing the energy in the flow, the valves operate with no outside power source and use no moving parts.



Plant operator Dana Ellis cleans off the Storm King after a rain event.

INNOVATIVE SPIRIT

The City of Saco's spirit of innovation extends beyond water quality to include energy and economics. "We're used to doing things a bit differently up here," says Howard Carter, deputy director of public works.

In the city's new headworks building, rooftop evacuated solar tubes capture the sun's energy and use it to heat water. The hot water then passes under the floors of the 660-square-foot building, radiating heat to keep the space at 50 degrees F or greater.

At the wastewater treatment plant, a Sky Stream 1.8 kW wind turbine from Southwest Windpower of Flagstaff, Ariz., provides supplemental power for the administration building. The wind generator has proven cost effective, and Carter believes having the unit at the plant also helped educate the community about renewable resources. That set the stage for a larger 50 kW unit installed in the city's downtown earlier this year.



Howard Carter, deputy director of public works, with the 1.8 kW wind turbine that provides the power for the treatment plant's administration building.

The valves allow a maximum of 5.2 mgd of the combined flow to pass through to the headworks at the treatment plant, and then divert any excess flow to a Storm King Advanced Hydrodynamic Vortex Separator (HDVS), also supplied by Hydro International.

The HDVS, 22 feet in diameter, combines floatables capture, high-rate sedimentation, mixing, and disinfection in a single compact vessel. An integral self-cleaning Swirl-Cleanse screen and Grit King grit collector capture floatables and grit and essentially provide preliminary and primary treatment of the excess storm flow. The HDVS unit also provides high-rate chemical disinfection, followed by

dechlorination of the flow before discharge to the river.

The system achieves disinfection in a minimum contact time of only eight minutes, contributing to the compact size of the system. The HDVS has a peak design flow of 5.6 mgd, although it can effectively handle hydraulic flows higher than that.

Like the flow control valves, the HDVS has no moving parts, relying instead on the energy of the flow. It also has a series of baffles to produce the high-rate rotary flow through the unit. The vortex separator has achieved high levels of pollutant removal. "We've been very impressed; it's a great tool to have in our CSO toolbox," Carter says.

Below, Peaslee checks the hypochlorite pumps for the disinfection system at Saco's wastewater treatment plant. At right, he performs a routine lab analysis in the treatment facility.



A SCADA system made up of Allen-Bradley PLCs (programmable logic controller) and Rockwell Automation software ties all elements of the system together, including the HDVS, the wastewater treatment plant, and satellite pumping stations. The system triggers automatic sampling of the stormwater influent and effluent flows. It also controls the chemical pumps associated with the system.

Help from history

The design of the Saco stormwater control system was not easy because storm flows are infrequent and unpredictable. "Treating stormwater isn't a finite thing," says Christopher J. Osterrieder, senior engineer with DeLuca-Hoffman Associates Inc. of South Portland, Maine, the engineering firm that worked on the Saco sewer project. "We had to be careful to only send enough water so that we can perform within the vortex separator's rated range."

To gauge the storm system needs, the city analyzed precipitation in the Saco River from the 1980s and '90s, as well as a recent four-year period. Based on these findings, city officials felt confident they could estimate future storm events and design an adequate system. To fine-tune the system and achieve optimum operability, they used simulated flows of 4 to 20

"The treatment plant staff takes great pride in their jobs and what they do for the environment, and they are extremely motivated and involved. That makes projects such as those in the CSO control program easier to implement."

Howard Carter

mgd to help determine how the system would ultimately be run.

Maintenance of the HDVS is minimal. After storms, the dewatering pumps transfer all solids from the separator back to the treatment plant for disposal. The maintenance crew simply performs a quick washdown of the separator tank to prepare for the next storm.

"It's very simple, and that's a big thing for us," says Carter. "We have a staff of eight and work one shift." The staff operates 29 pump stations, handles system billing, and runs the treatment plant, so simplicity and efficiency are a must.

In addition to the staff that maintains the treatment plant and pump stations, two city employees perform routine maintenance of the collection system and CSO overflow structures. They use a 2100 Series Vactor sewer cleaner truck from Vactor Manufacturing.

Recording results

To help fund the CSO program, the city charges impact fees.

Each new project pays a one-time CSO impact fee of \$2,001, adjusted yearly according to the Consumer Price Index. There is also a one-time sewer impact fee of \$2,700, based on estimated new-home usage of 185 gpd.

In short, explains Carter, any use that contributes new flow to the wastewater system is subject to impact fees. "The fees allow the city to recover a fair portion of the infrastructure improvements made to accommodate new uses," he says. "Without the impact fees, existing tax and sewer rate payers would be asked to pick up the cost of providing additional improvements for new development."

Since it went online in November 2006, Saco's stormwater control system has been highly successful. "We've had some large storms, and the system still performed very well," says Carter. "We're getting consistent results from varying degrees of storms."

The system received a serious test in April 2007, when huge storms along the Maine Coast cre-

ated wet-weather overflow conditions for five consecutive days. The system responded well, even though hit with instantaneous peak flows above 4 mgd. Results collected for all overflow events from startup of the system through February 2008, show:

- Average influent TSS of 135.2 mg/l and average BOD of 97.2 mg/l.
- Average effluent TSS of 46.4 mg/l and average BOD of 29.8 mg/l.

That's a TSS removal rate of more than 69 percent and BOD removal rate of nearly 66 percent. In the end, that means less waste material entering the community's sensitive water resources — and a cleaner environment and higher quality of life for all. ■

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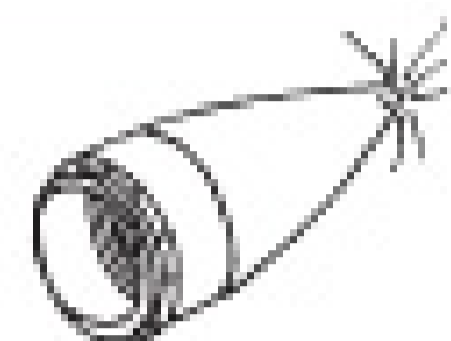
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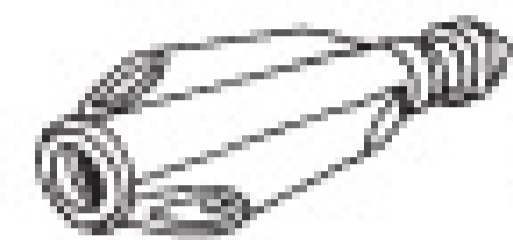
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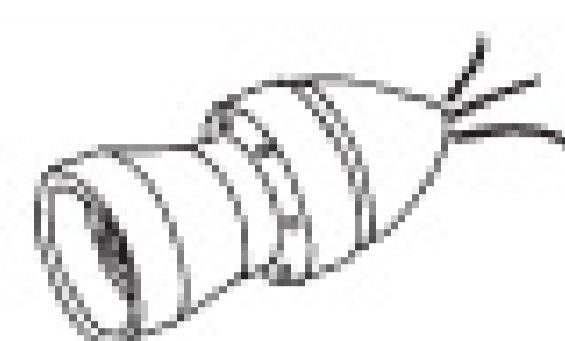
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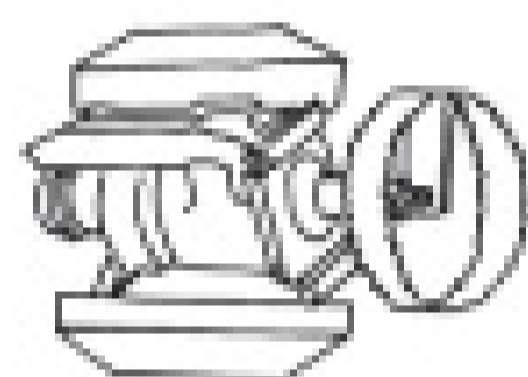


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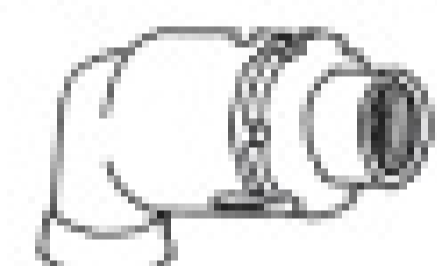
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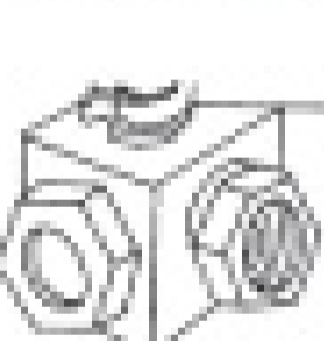
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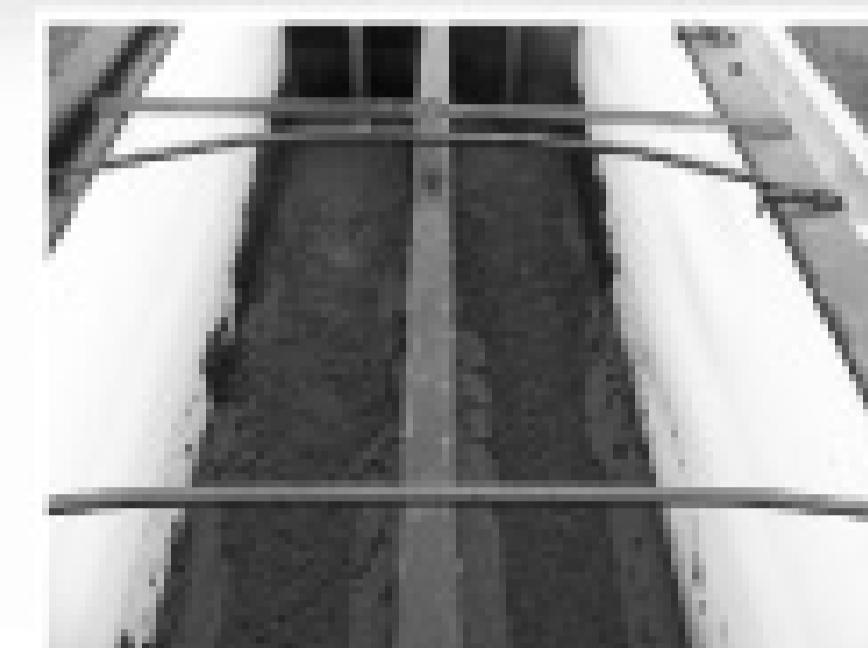
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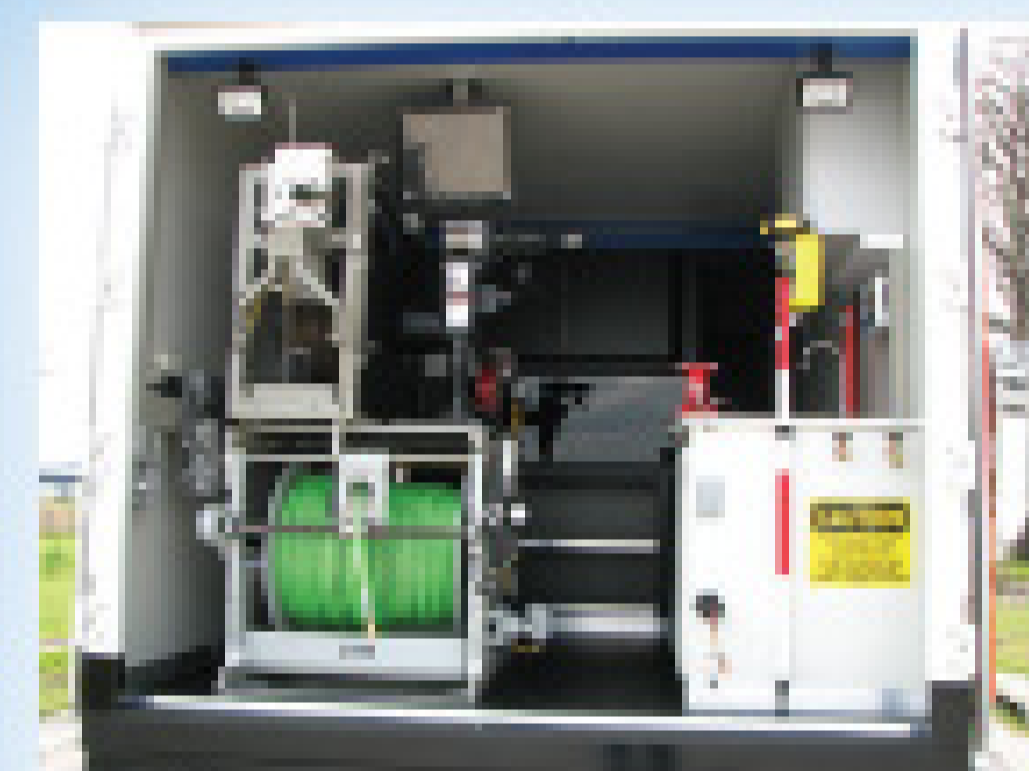
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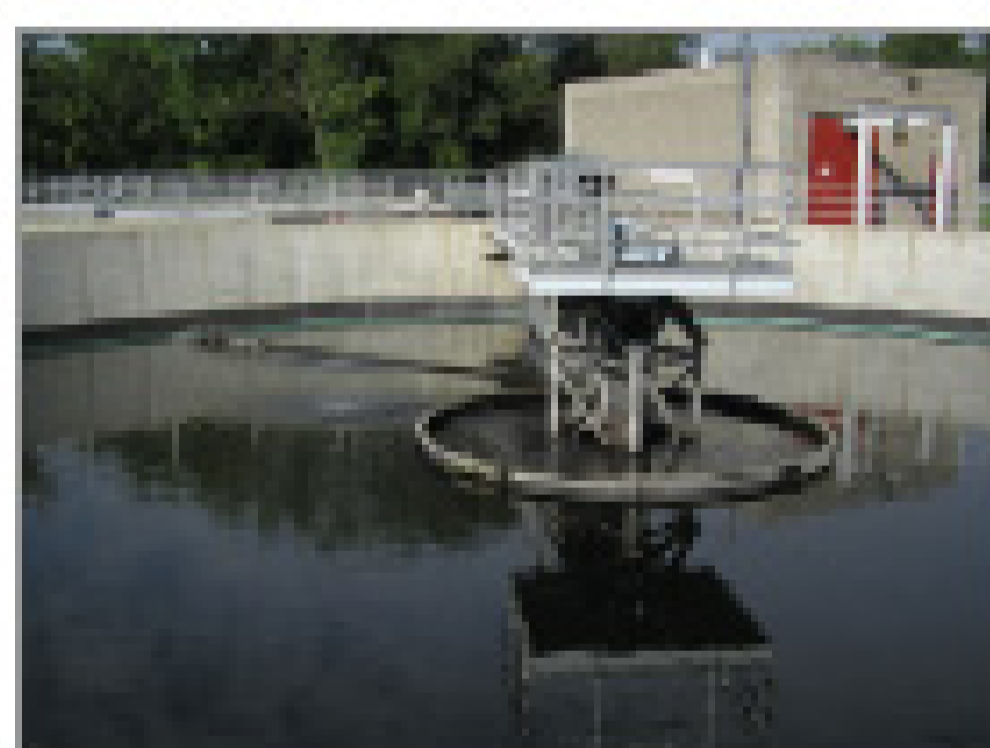
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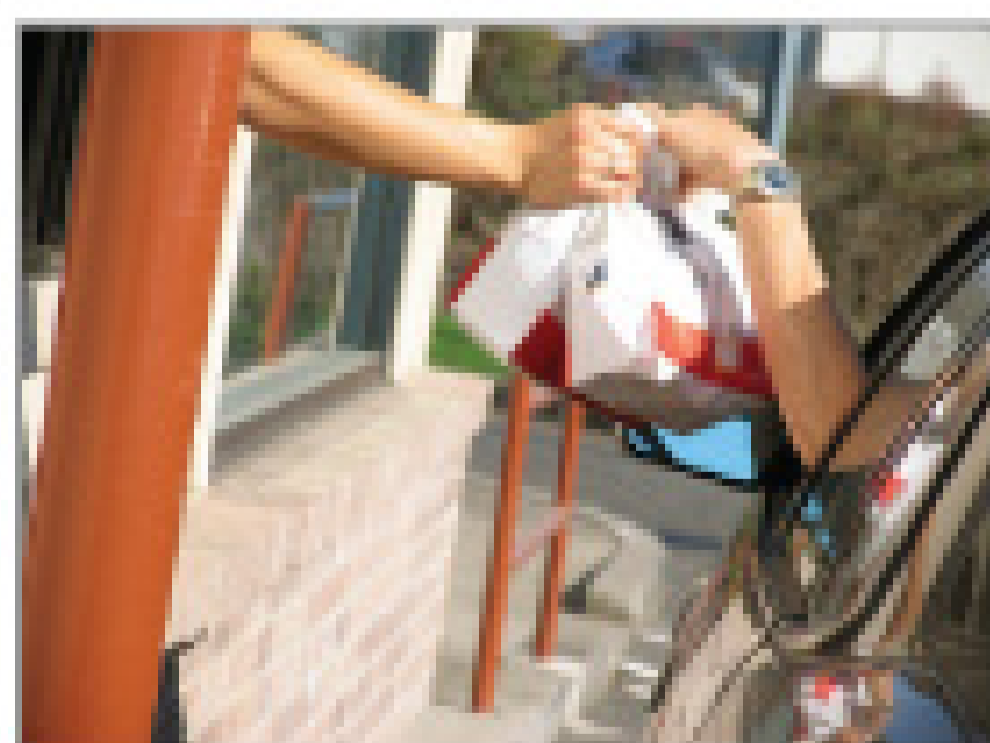
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BLAZING THE TRAIL

An effective monitoring program is among the keys to success for the Stormwater Quality Improvement Program in Sacramento, Calif.

By Angus W. Stocking, L.S.

The City of Sacramento (Calif.) established its Stormwater Quality Improvement Program (SQIP) before such initiatives were required by federal law.

The Clean Water Act included a stormwater component in 1987, and the city established the SQIP in 1990, about a year before it was required to, with the aim of reducing stormwater pollutant loads.

"In the 1990s, this was new territory," says Bill Busath, supervising engineer for the city. "My prede-

cessors in the program were proactive." But being a pioneer meant there were no models to follow. Instead, the city worked with other fledgling stormwater programs, the regional water quality control board and consultants like Larry Walker Associates to craft a countywide program that has become a model.

A foundation of the Sacramento program is stormwater monitoring, mainly by consistent sampling. Monitoring established baselines and provided data to develop policies for the program. Monitoring

continues today as a way to establish trends and evaluate the effectiveness of the program. Information from sampling guides the program's approach to working with businesses, contractors and the public, and to help determine which practices work and which do not.

The program operates with a total budget of about \$4.5 million countywide. About a third comes from the city, and the rest from Sacramento County and other incorporated entities in the county, working under a memorandum of understanding. "It's very cost-effective

to work with other entities in the county," says Busath. "If every jurisdiction had its own program, we'd be spending more money and getting fewer results."

Sampling to set standards

"The main reason we started monitoring was to establish baseline conditions — the pollutant loads that existed before the SQIP got started," says Busath. "We continue to do monitoring for various purposes, such as to gauge compliance with the NPDES permit. We also perform special studies like before-and-after sampling to measure the effectiveness of a particular best management practice (BMP), like a grassy swale. In time, we hope to be able



PROFILE:
City of Sacramento, Calif.

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1850

POPULATION:
467,000

AREA SERVED:
99.2 square miles

ANNUAL PRECIPITATION:
18 inches

ANNUAL BUDGET:
\$4.5 million (stormwater program countywide)

WEB SITE:
www.sacstormwater.org

Roxanne Dilley, a stormwater engineer with the City of Sacramento Department of Utilities, collects a water sample near the inlet of a water quality detention basin to test for pollutants from urban runoff. (Photos by Lezlie Sterling)



to see reductions in pollutants. Then we will have an idea that our program is having an effect.”

One big decision made early on, guided by sampling, was to concentrate on a relatively small number of target pollutants. “We found a few classes of pollutants that appeared consistently in all our samples, and we determined they were having the most detrimental impact on our creeks and rivers,” says Busath.

“It’s very cost-effective to work with other entities in the county. If every jurisdiction had its own program, we’d be spending more money and getting fewer results.”

Bill Busath

“We developed reduction strategies that included identifying and prioritizing sources, and then source reduction strategies.” Though samples can be analyzed for hundreds of pollutants, SQIP targets three main types: pesticides; metals like copper, lead, mercury and zinc; and bacteria like *E. coli* and fecal coliform.

“When we came up with the idea to target just a few pollutants, it was a relatively new concept, but now it’s pretty standard,” says Busath. A focus on the reduction of a few target pollutants helps the SQIP concentrate its mitigation efforts, and the focused efforts themselves have an impact on the broad spectrum of pollutants.

Regular sampling

Staff members sample rivers eight times a year at five sites on the Sacramento and American rivers. There are sample sites upstream and downstream from urban discharges, and a middle site on the Sacramento River.

Samples are sent to labs for analysis and are flow-weighted. “We want to develop pollutant load figures, which is basically flow times concentration,” Busath says. Three to four representative creeks are also sampled and tested for the whole suite of pollutants. Samples are routinely taken at several urban discharge sites.

In addition to pollution monitoring, SQIP does bio-assessment monitoring. “So far, our observation shows that wildlife levels are pretty static,” says Busath. “We rate a stream’s riparian habitats and pull up sediment samples to check on the benthic macroinvertebrate community. A good array of bugs indicates a healthy system.

“We have some healthy creeks and some not-so-healthy creeks, and indications are that, overall, they haven’t changed much. But over time, the biological monitoring may prove to be a better indication of health than pollutant monitoring.”

The program is just starting to get enough data to analyze trends. “We’ve had some definite successes, and we see some trends, but it’s difficult to establish statistical significance with the amount of data that we have now,” Busath says. “Still, there are some things we’re sure of.

“For instance, we’ve seen the levels of pesticides like diazinon fall significantly after those prod-



Roxanne Dilley (right) and Damien Charley, a stormwater group member, collect a stormwater sample at the outlet of a water quality detention basin.



Dilley pours water from a rope bailer into a sample jar at the pump station.



Dilley and Charley collect a grab sample at the end of the water quality detention basin.

BOTTOM DWELLERS

Benthic macroinvertebrates are a useful indicator of the health of riparian environments because they’re easy to gather and identify, are long-lived, and tend to stay in one place.

In addition, different types of these organisms — relatively large insects that live at or in the bottoms of creeks and rivers — respond different to levels of pollution. Some, like stoneflies, are only found in clean, uncontaminated waters, while midges and worms are more common in dirtier waters.

Levels of benthic macroinvertebrates do not by themselves give a complete indication of water quality. But, generally speaking, high quantities and a good variety of such organisms are good signs.

ucts were banned for most urban uses. They seem to have been replaced by pyrethroids, but it does show that banning reduces pollutant levels. We've also seen lead levels go down due to the removal of lead from most substances, and levels of some other metals, like copper and zinc, appear to be showing downward trends, though it is not yet conclusive. On the other hand, levels of bacteria and mercury have been relatively unchanged."

So far, sampling data has driven some program mitigation activities, but the SQIP realizes that the data can and needs to be used more effectively. "To date, we've not used the data to the full extent

"We have some healthy creeks and some not-so-healthy creeks, and indications are that, overall, they haven't changed much. But over time, the biological monitoring may prove to be a better indication of health than pollutant monitoring."

Bill Busath

in assessing and guiding program activities, but we're getting to the point where we're ready to shift focus," Busath says.

Working with contractors

SQIP now has two full-time inspectors checking on erosion and sediment control at construction sites. They follow a well-developed protocol for inspection and suggested BMPs for such sites. It took a while to get to that level. "Our first permit focused on rivers, and we didn't get to inspection until the second round," says Busath. "Since we didn't have any models, we had to develop our own training."

SQIP worked with regional water quality control boards to develop basic principles, and also worked with building industry representatives. Inspectors were involved from the beginning, helping to develop the standards they would enforce. At first, this meant inspectors had an unusual degree of autonomy in their duties.

The contractor program relies on two basic strategies: soil stabilization and filtration. Stabilization techniques like mulching and seeding are common. For filtration, BMPs like fiber rolls and

gravel filter bags are used. Standards for concrete washout have also been developed. Instead of washing out concrete trucks in gutters, contractors are required to use special designated areas.

In addition to inspections, SQIP staff members review new development plans and work with developers to build effective post-construction runoff treatment BMPs into new construction. Busath believes the inspection program has been effective in reducing pollutants in runoff from construction sites.

"There was plenty of resistance at first, and contractors really didn't like installing BMPS," he says. "It's hard to blame them — the idea

was completely foreign to them. But over the years, the program has become very effective. Random pictures from ten years ago show that there's really no comparison to today. The runoff is much cleaner, and sites are better controlled."

Educating the public

SQIP is serious about public outreach. "We spend about \$250,000 a year on public outreach through community grants, the media, and elementary education," says media and communications specialist Jessica Hess. "Our basic message is to teach the public how everyday activities affect water quality. We publicize common things, like dumping oil, but also more subtle things like sweeping instead of hosing down."

Staff and consultants present a one-hour program to third-, fourth- and fifth-graders in classrooms and larger assemblies throughout the county. The program is interactive, with demonstrations and pictures. "We get a lot of positive feedback from teachers, and we're raising an aware and more responsible generation," Hess says. "When I'm at community events, kids will come up to me



Damien Charley and Roxanne Dilley use a rope bailer to collect a water sample from a wet well at a pump station.

and say, 'I remember you, you told us to wash the car on the lawn!'"

Outreach also includes efforts to curtail illegal stormwater discharges — potentially a major source of pollutants that are difficult to regulate. The approach is to focus on one type of business at a time — like dry cleaners, carpet cleaners and landscaping firms — and enlist their cooperation by "branding" businesses that follow guidelines.

"We've had limited success, but the most success we've had has been with carpet cleaners and pressure washers. They agree to dispose of waste in sanitary sewers, and we certify them as Clean Water Business Partners. They get stickers and other materials they can use, and we do some advertising on their behalf."

Building a brand

Ultimately, the intent is to build a Clean Water Business Partner brand that has resonance with the public and gives businesses an incentive to cooperate. "We do have reports from time to time of Clean Water Partners dumping illegally, but it's rare; after all, what we're asking them to do is not that difficult," Busath says.

Speaking in general of illegal discharges to the storm drains, Busath wonders if increased public awareness might be distorting the issue. Reports of illegal dumping are up, but it could be that the amount of dumping is declining while, because of public awareness, reporting is much more common.

"Unfortunately, we didn't have any good measures of illegal dumping before this program started — there's no way to know how common it was," Busath says. "Increased public awareness is good, of course, but it may be obscuring actual successes."

SQIP also seeks to reduce pollutants from industry, mainly through facility site inspections by staff from the County of Sacramento Environmental Management Department. Here too, specific types of industries are inspected for pollutant reduction practices.

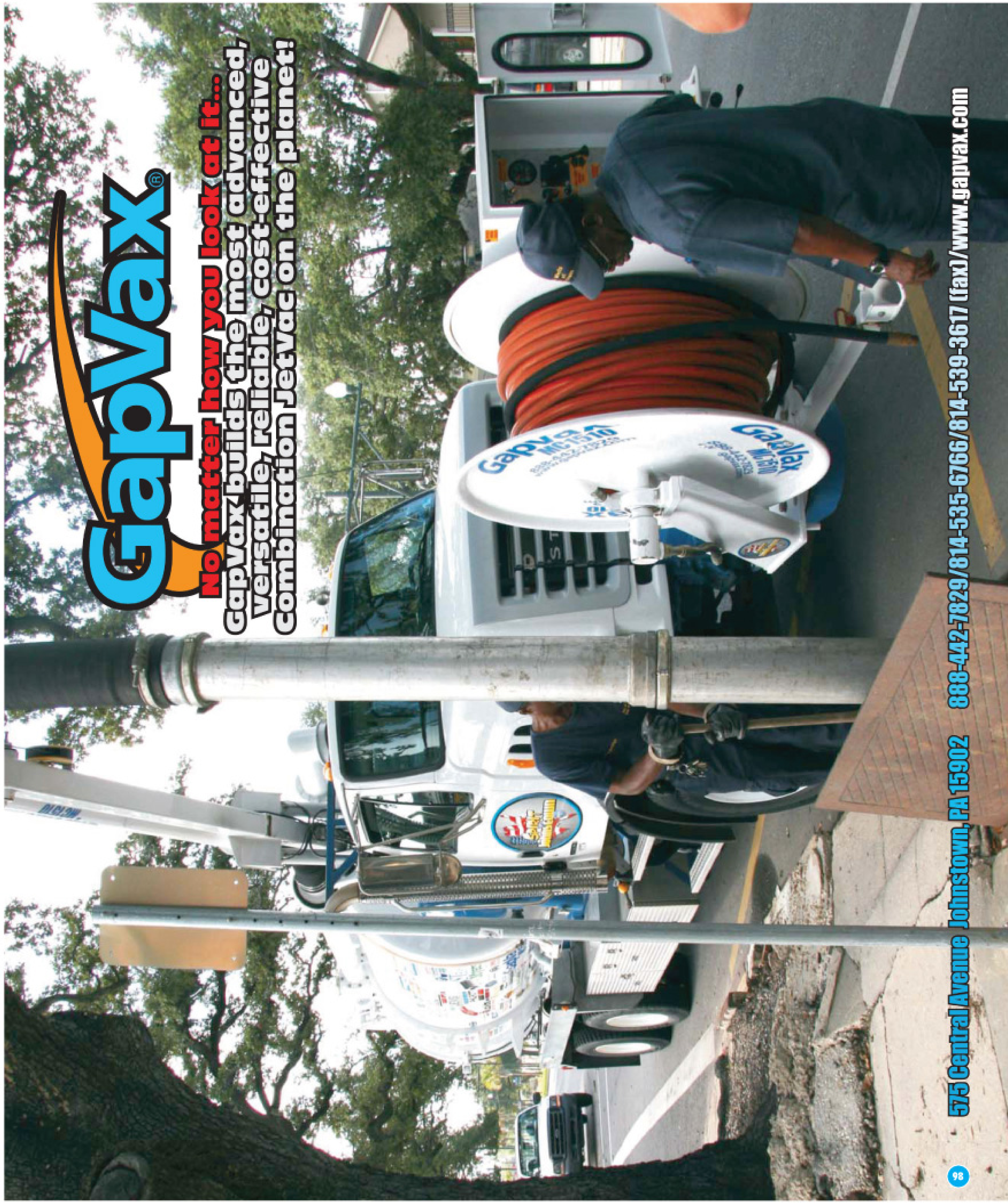
Busath is cautious, but not pessimistic, in assessing the successes of SQIP. The program is one of the oldest and most comprehensive in the country, but it is just getting to the point where monitoring provides useful guidance and statistically significant evidence of trends. "Ten years of data isn't really enough," Busath says.

On the other hand, sampling data has helped to establish priorities, and it confirms that some high-level decisions, such as targeting a limited number of pollutants, have been correct. Now that sufficient data is available, and as the focus shifts to better data analysis, Busath expects feedback from sampling to better focus stormwater management activities.

It's hard to be first, but Sacramento crafted an approach, guided by sampling and other real-world feedback, that was effective from the beginning and promises to become even more effective as time passes. ♦

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NEW TOOLS FOR MUNICIPAL PROS

A record number of exhibits include a variety of new technologies to enhance efficiency and quality in underground infrastructure maintenance

By Ted J. Rulseh

Advances in technology for municipal maintenance professionals took the spotlight at the 28th Annual Pumper & Cleaner Environmental Expo International in Louisville, Ky., Feb. 28 to March 1. The event attracted 11,415 attendees representing 4,688 companies and municipal agencies.

The record total of 562 exhibitors included producers of trenchless pipe rehabilitation systems, waterjetters, vacuum and combination trucks, video inspection technologies and software, and much more. Here is a sampling of products appearing for the first time on the exhibit floor.



High-torque cutter

The **Paikert Hydro-Torque** impact cutter Model SB150 from **NozzTeq** is available in sizes from 27 to 36 inches. The cutter, powered by a waterjet, operates at more than 100 gpm and requires no lubrication.

The unit can be completely submerged in water and with no effect on performance. Its impact drill motor enables it to operate in three modes: impact and drill, impact only, or drill only. 866/620-5915; www.nozzteq.com.

Pipe profiler

The **Coolvision** laser profiler from **Aries Industries Inc.** detects and records pipe profiles, deformations and dimensional anomalies in storm drains, sewer mains, and water pipes. It projects a laser light ring onto the pipe wall, where a video camera captures the ring image. Deflection measurements are then calculated by a computer and associated software. A variety of descriptive and comparative formats enable complete information reporting.

The unit is mounted on four stainless steel tracking wheels with two distance encoders. It needs to be only approximately centered in the pipe. The profiler is towed behind a pan-and-tilt camera-tractor system, concurrently taking profile readings and a video survey. It also can operate without a tractor and be pulled through the pipe. Profile data is transmitted via TV coaxial cable back to the TV truck. The unit inspects pipes from 8 to 36 inches. 800/234-7205; www.ariesindustries.com.



Bump-free cover

The **Bump-No-More** manhole cover from **I.B. Moore Co.** is a custom-thickness cover that replaces an old lid with a lid made to meet grade. Units can be installed in less than 20 minutes with no digging and no machinery and with minimal traffic diversion. Users can select any single or two-toned design from more than 20 color options. The lids are made of highly weatherproof and wear-resistant polyurethane. Each cover is guaranteed to fit within 1/8-inch of grade for up to three years. **859/255-5501; www.bump-no-more.com.**



Truck transmission

The **PFT-PCH/3000** hydromechanical drive from **OMSI Transmissions Inc.** is designed for municipal equipment and other applications. It is sized for trucks from 26 to 42 tons. The reduction box has a mounting flange for a hydraulic motor that, when connected to a pump operated by the diesel engine or from the transmission, permits the conversion of the vehicle's traction from mechanical to hydrostatic. **330/405-7350; www.omsitransmissions.com.**



Portable crawler camera

The **P350 flexitrax** portable crawler system from **Pearpoint** supports three interchangeable, high-resolution cameras, each with ultra-bright white LEDs. Digital video displays on the command module's bright 8-inch industrial grade TFT screen. Users can zoom and rotate photos and live or recorded digital video in real-time.

The command module also has Mimic display, an intuitive way of controlling pan and tilt. It stores survey data direct to solid-state Compact Flash cards, so there are no moving parts and files are secure and less vulnerable to shock damage and power outages. The crawlers can operate fully submersed and are water resistant to depths greater than 300 feet. They are made of brass and stainless steel and have 50W or 100W motors. An integrated sensitive inclinometer and the multi-frequency sonde allow users to map pipeline topography. **760/343-7350; www.radiodetection.com.**



Quiet jetter

The **Warrior** waterjetter from **Spartan Tool LLC** has a fiberglass casing that protects and silences the entire machine. It carries a 300-gallon water tank and delivers 4,000 psi at 8 gpm while staying within all OSHA noise standards, making hearing protection optional. A 180-degree pivoting hose reel and optional 6-function remote control make it easy to operate.

The unit cleans pipes from 3 to 24 inches. Standard hoses include 500 feet of 1/2-inch high-pressure hose, 100 feet of 5/8-inch rubber supply hose, 75 feet of 1/4-inch trap-cleaning hose, and 15 feet of color-coded leader hose. **800/435-3866; www.spartantool.com.**



Combination trailer

The **O'Brien JVLT Combo Trailer** from **Hi-Vac Corporation** carries a 500-gallon debris tank and 325 gallons of water capacity. The water pump is rated for 4,000 psi at 18 gpm, and the vacuum system can deliver 16 inches Hg. It carries 400 feet of 1/2-inch jetting hose on a reel with 180 degrees articulation.

The unit is powered by a 75-hp water-cooled diesel engine. Simple controls are located on the swing arm of the trailer. The water pump and vacuum blower can operate simultaneously. The debris tank has a 55-degree dump angle and an easy-opening rear door with dual sight-level gauges. **740/374-2306; www.hi-vac.com.**





Trailer jetter

The **Sewerjet 700** waterjetter from **John Bean Sprayers** requires only one operator and is designed for easy towing behind most pickup trucks. It includes a 700-gallon corrosion-resistant black polyethylene tank and a curbside fillup with a standard 2.5-inch fire hydrant fitting. One operator can guide the hose, control the reel, operate the engine, and observe progress from a workstation at the rear of the unit.

The jetter carries 600 feet of 3/4-inch or 800 feet of 1/2-inch hose. Power comes from a 4-cylinder, 93-hp Ford water-cooled gasoline engine or a 4-cylinder John Deere water-cooled 80-hp diesel engine. The 3-piston pump delivers 40 gpm/2,000 psi. 800/241-2308; www.johnbeansprayers.com.



Manhole nozzle

The **Alphajet** nozzle from **USB Sewer Equipment Corp.** cleans lift stations, manholes and other structures before rehabilitation. It is actuated by water from the pressurized hose of a jetter truck. Two stainless steel driving nozzles rotate the cleaning head as two oscillating nozzles clean the pipe surface. No lubrication is required.

The nozzle operates at 30 to 60 gpm and 2,000 psi. Threaded, replaceable nozzle inserts are available. 770/984-8880; www.usbsec.com.



Traffic signal

A **traffic safety blanket** from **Milwaukee Rubber Products Inc.** holds magnetically to a truck tailgate or other ferrous metal surface and provides clear instructions to motorists. The unit has 36 red LED bulbs hidden inside a waterproof clear cap mounted in arrows with reflective surfaces. The lights can be seen from 2,500 yards away. Grommets on four sides can be used to help secure the unit in strong wind.

The device has four lighting modes: arrows flashing in sequence, all arrows flashing simultaneously, all arrows continuously on, and reflectors only (lights off). 262/781-7888; www.milwaukeeerubber.com.



Dewatering system

The **IFRS 36 Separator** from **Accent Manufacturing Inc.** separates bulk inorganic materials from wastewater and acts as the front end of a waste dewatering system. Materials are injected through an 8-inch line and pushed through a set of flighting, leaving the solids to be discharged and the liquids to be conveyed for further processing via polymers or another technique. 604/850-7799; www.accentmanufacturing.com.



Inspection crawlers

Steerable pipe crawler packages from **RoboProbe Technologies Inc.** include a crawler unit, camera with LED lighting, 500 feet of video cable, and a manual cable reel. The units are for use in 8- to 36-inch lines. The steerable units have dual-motor drive and variable speed and can accomplish runs up to 1,000 feet. **888/598-1645; www.roboprobe.com.**



Dual-mode camera

The **OmniSTAR Probe** camera from **RS Technical Services Inc.** can be used as a push camera or as a crawler-mounted mainline camera. The unit has 12 high-intensity LEDs, 270-degree pan viewing, and 360-degree continuous camera head rotation. Designed to fit 3-inch and larger lines, it can be mounted on single-conductor push rod or on any RS Technical transporter. **800/767-1974; www.rstechserv.com.**



Manhole lining system

The **Monoform** manhole liner forming system from **Infratech** provides a no-dig approach to manhole rehabilitation. An ABS plastic interior forming system allows ready-mixed concrete to be poured to restore structural integrity and reduce infiltration.

Concrete is poured into the annular space between the form and the manhole structure. The system is set up to conform to the inside dimensions of the existing manhole. It is available in 40-, 36-, 32- and 26-inch barrel sizes. Custom 60- and 48-inch diameters for lift stations are available. The forms can be used with a variety of chemical-resistant coatings. **800/533-4244.**



Lifting systems

Bumper cranes from **Sto-Away Power Cranes** mount to the back of a service vehicle and help in lifting equipment out for service. The units replace the vehicle's rear bumper and attach to the truck frame.

Cranes come pre-tested and with all necessary hardware. They occupy no bed space and need no reinforcing or suspension modifications. One person can unfold a crane from the step bumper in less than 10 seconds and can safely lift 1,000 to 3,000 pounds with the push of a button. **800/622-9797; www.stoaway.com.**



Hydrant tester

The **Fire Flow Pro** system from **Hurco Technologies Inc.** allows one person to test fire hydrants for the necessary volume and pressure for firefighting. The system uses wireless radio frequency technology, allowing the operator to collect critical pressure data and GPS location from the test hydrant. All computer and electrical components are protected in waterproof carrying cases. The system provides detailed flow reports for use at the scene of a fire. It meets NFPA recommendations. **800/888-1436; www.gethurco.com.**



Efficient belt press

The **Model 3DP** belt filter press from **BDP Industries** uses Independent Gravity Zone Technology to improve solids loading rate and cake solids. Separate gravity and pressure zones allow optimization of the porosity of the filter belt fabric and belt speed. Increased belt speed means a thinner cake is applied to the belt. Resistance to filtrate flow is reduced exponentially with reduction in cake thickness. **518/695-6851; www.bdpindustries.com. ♦**

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| Surface Sealer _____ | Acrylic Polymer |
| Crack Sealant _____ | Cold Application Pourable Asphaltic |
| Adjusting Rings _____ | Cast in Place, Steel Reinforced |
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| ASTM Numbers _____ | ASTM D-1784, D-2412, D2444, D2152, F-1803, D-71, D-6 |
| Traffic Loading _____ | Exceeds HS-20 |
| Shape of Repair / Depth of Cut _____ | Round for Maximum Durability / Full Road Penetration 8"-20" |
| Diameter of Cut _____ | 42" - 86" To Accommodate Large Manhole Frames |
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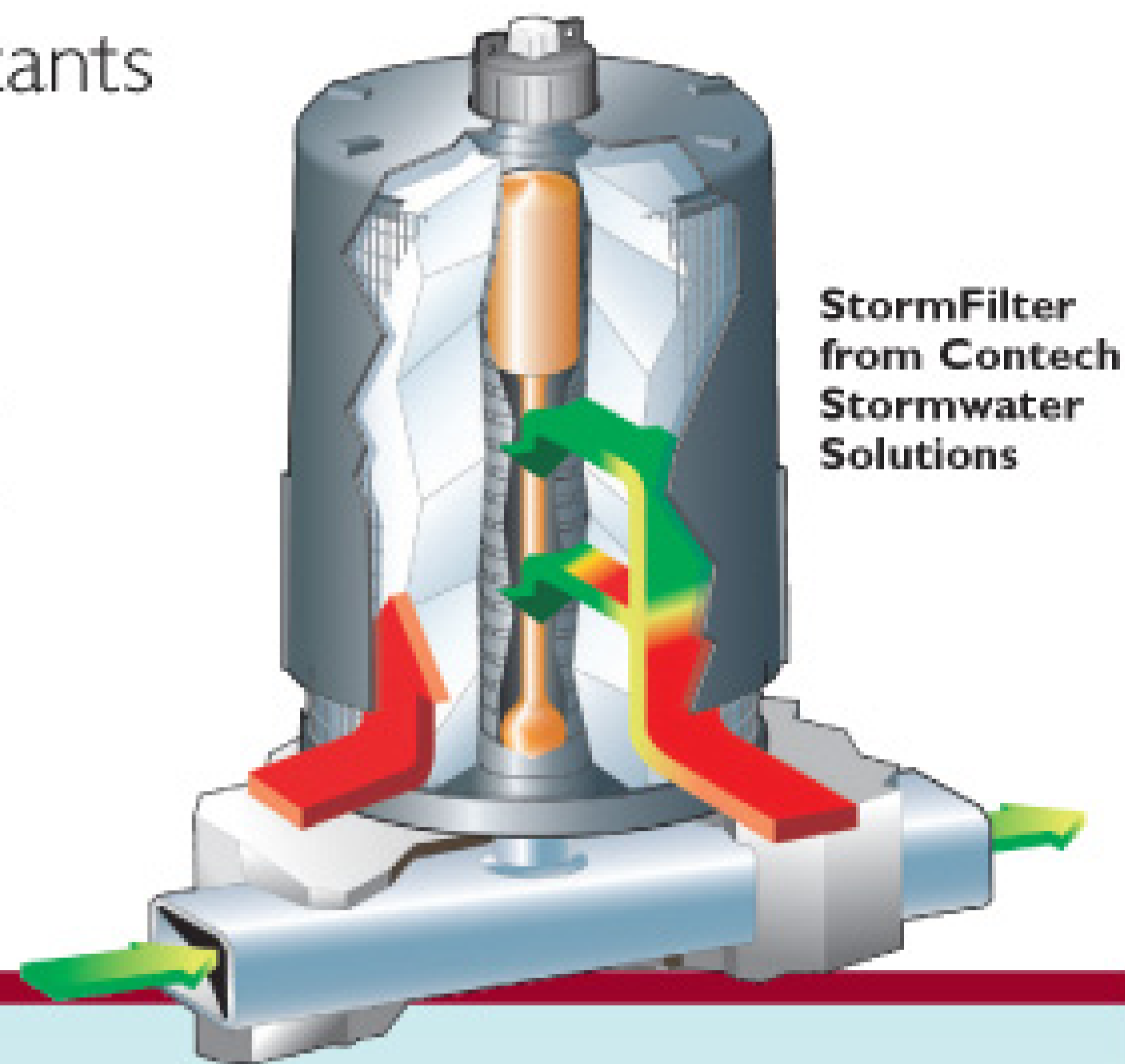
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TRAPPED AT THE SOURCE

Filters of many kinds help municipal agencies keep pollutants out of stormwater flowing into lakes, rivers and streams

By *Scottie Dayton*

In many communities, stormwater no longer flows untreated off streets, roofs and parking lots into important waterways. Driven in part by federal regulations, many municipal agencies have installed stormwater filters that trap trash, debris, oils, and other contaminants before they enter the environment. Here is a sampling of the stormwater filtration technologies now available from industry manufacturers. Many of these qualify as Best Management Practices under U.S. EPA regulations.



Custom-engineered

The **Aqua-Filter** stormwater filtration system from **AquaShield Inc.** is for sites requiring advanced treatment of runoff stormwater that may discharge into sensitive receiving waters. The system can be custom designed for new construction projects or retrofitted for existing storm drainage structures. Its modular shape and HDPE construction make it easy to install.

Peripheral pretreatment of contaminated stormwater is unnecessary, as the system uses a treatment sequence that removes coarse and fine pollutants. The Aqua-Swirl concentrator removes gross pollutants, allowing larger debris to settle before filtration. Third-party testing demonstrates total suspended solids removal of greater than 80 percent, and the effective removal of additional pollutants includ-

ing free-floating oils and debris, phosphorus, and heavy metals such as copper and zinc.

The system operates under gravitational and hydrodynamic forces with no moving parts or valves. It also runs in an offline configuration as recommended by the Center for Watershed Protection and most municipalities, treating 90 to 95 percent of the annual rainfall on a given site. **888/344-9044; www.aquashieldinc.com.**

Phosphorus filtration

FabPhos filters from **Fabco Industries Inc.** treat total and orthophosphates in surface water runoff. Field studies have confirmed reductions of greater than 50 percent. The media comes in replaceable cartridges to fit

StormBasin and StormPod catch basin inserts or in bulk form. **516/433-4148; www.fabco-industries.com.**

Canister filters

EcoSenseT stormwater filtration systems from **EcoSense International** are structural devices tested and used internationally. They have demonstrated greater than 95 percent TSS removal as well as effective removal of pollutants including suspended and emulsified hydrocarbons (oils, grease, and fuels), phosphorus and nitrogen, volatile organic compounds, PCBs, and various organically bound heavy metals, while allowing the treated water to pass through quickly and safely to be reused or discharged.

Media formulations that kill bacteria and remove dissolved heavy metals are available.



EcoSenseT stormwater filtration systems from EcoSense International



The systems are designed to deflect materials like leaves and coarse sediments away from the entry ports, minimizing flow impedance. After first flush, the Clean PassT Over Flow bypass system detains floatables, allowing only clean water through. Once the storm event subsides, the filter catches up and continues to filter all incoming stormwater. Filters last six months to two years depending on the application. Systems are usually installed in less than one hour. Call 866/449-0324 or visit www.ecosenseint.com.

Multiple approvals

The stormwater management **StormFilter** from **Contech Stormwater Solutions** removes most target pollutants including fine solids, soluble heavy metals, oil, and total nutrients. Its surface-cleaning system prevents surface blinding to extend cartridge life.

The filter has been field tested and has received hundreds of stand-alone approvals

from regulatory agencies. It was the first to receive Final Certification from the New Jersey Department of Environmental Protection as a stand-alone stormwater treatment system. Recent enhancements decrease the overall system size, provide a low-drop cartridge for sites with hydraulic drop limitations, reduce installation time, and simplify maintenance. 800/925-5240; www.contechstormwater.com.

Stainless construction

Hurricane Swing Bolt filters from **Harmsco Inc.** are built to ASME design with flow rates up to 1,200 gpm. The Hydro-Cyclone tangential inlet and integral inner can create a centrifugal flow that induces pre-filtration by heavy particulate separation.

The upflow design self-purges air from the housing, eliminates bypass contamination during servicing, and improves efficiency by creating an even flow distribution across the filter media. Swing-bolt-style-housing closures are easy to service and allow uniform loading of filter media. Replacement filter cartridges come in assorted models including antimicrobial and activated carbon. One person can perform maintenance. 800/327-3248; www.harmsco.com.

Targets pollutants

The **FloGard Perk Filter** from **Kristar Enterprises Inc.** captures and retains sediment, oils, metals, and other constituents close to the source, reducing the total discharge load in stormwater runoff from urban developments. The filter cartridge is made from durable polymeric components with a polymer-coated steel sup-

port screen and stainless steel hardware. Its base construction allows various media to address site-specific pollutants.

With modular and scalable design, the filters provide a simple and low-cost solution for installation and long-term maintenance. Units may be installed as a retrofit to suitable existing curb inlets, drop inlets, or combination catch basins, as integral parts of coated steel- or concrete-housed stormwater inlet systems for commercial, residential, and industrial developments, or as centralized modular treatment systems installed online or offline. 800/579-8819; www.kristar.com.

Urban filter

The low-maintenance **Ultra-Urban Filter** with Smart Sponge from **AbTech Industries Inc.** treats stormwater runoff for new or retrofitted sites by absorbing oil and grease, and capturing trash and sediment. The system, suitable for municipal, industrial, and construction applications, is identified by the EPA as a Best Management Practice for stormwater management.

The Smart Sponge Plus filter destroys bacteria using an antimicrobial agent that is chemically and permanently bound to the polymer surface. Targeted bacteria include enterococcus and coliforms such as fecal coliforms and *E. coli*. Filters come in modular units for curb inlet openings and single units for drop-in catch basin drains. 800/545-8999; www.abtechindustries.com.

Antimicrobial chambers

Kleerstream antimicrobial filtration chambers from **Katchall Filtration Systems LLC** combine two separate filtration technologies inside one reinforced, self-contained concrete structure. Particulates greater than 100 microns, debris, and floating materials are removed in the hydrodynamic separation stage.

In the second stage, antimicrobial filtration



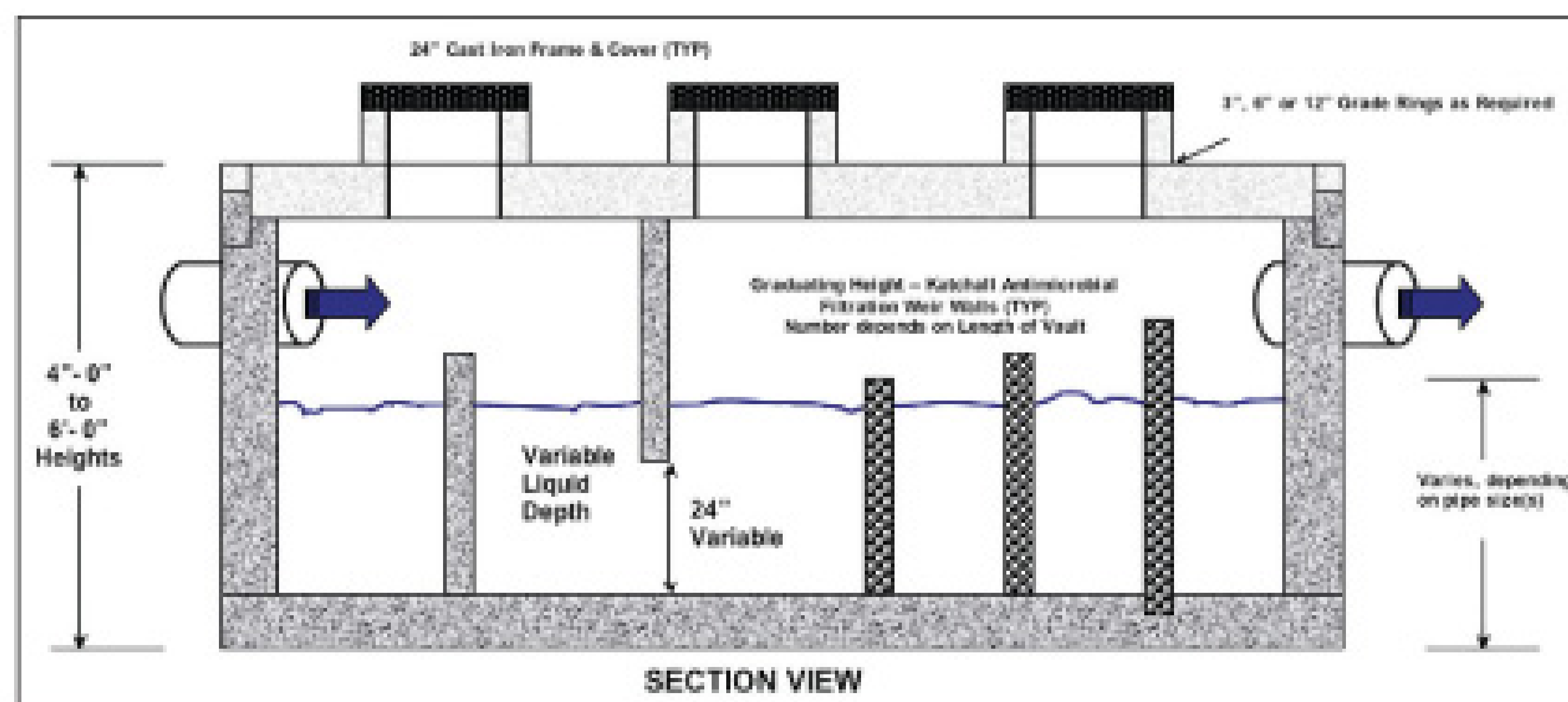
Hurricane Swing Bolt filters from Harmsco Inc.



FloGard Perk Filter from Kristar Enterprises Inc.



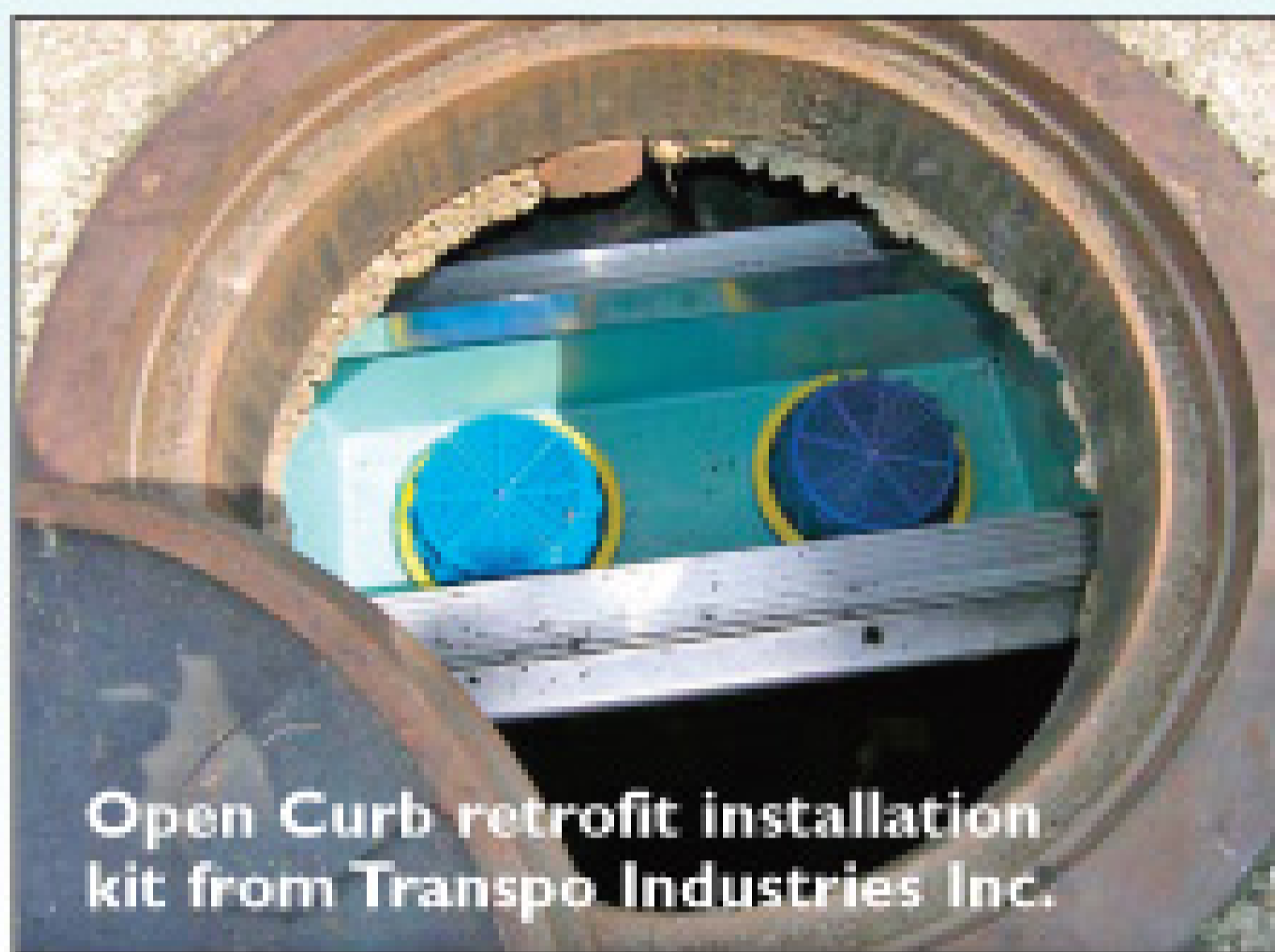
Ultra-Urban Filter from AbTech Industries Inc.



Kleerstream filtration chambers from Katchall Filtration Systems LLC



ClearWater BMP stormwater filters from ClearWater Solutions Inc.



Open Curb retrofit installation kit from Transpo Industries Inc.

weir walls remove total suspended solids, hydrocarbons, nutrients, and heavy metals to less than 50-micron levels, and provide positive pathogen kills up to 99.99 percent with less than one second contact time (results from Microbac Laboratories Inc. in Corona, Calif.).

The shallow-draft chambers are 4 to 6 feet deep and require only a 12-inch height differential between the inlet and outlet pipe elevations. Model 120, the smallest unit, needs less than 40 square feet, is H-20 rated, filters 7.6 cubic feet per second, and retains about 1.5 cubic yards of solid waste materials. Seven sizes are available for inline or offline (first flush) filtration devices. 866/528-2425; www.katchall.net.

Efficient removal

ClearWater BMP stormwater filters from **ClearWater Solutions Inc.** use a stainless steel filter system that screens, triple settles, and filters stormwater within concrete sidewalk curb inlet drain boxes. The design reduces concentrations of trash, sediment, hydrocarbons, metals, and nutrients.

San Diego State University testing established that units remove 97 percent of total suspended solids, 86 percent of hydrocarbons, 83 percent of zinc, and 81 percent of lead. Designed to retrofit within existing curb and gutter infrastructures, the filters handle heavy storm flows, are non-scouring, use mosquito-free technology, and require no excavation or concrete modification. 800/758-8817; www.clearwaterbmp.com.

Open curb inlet

The **Open Curb** retrofit installation kit from **Transpo Industries Inc.** employs the EnviroSafe modular stormwater catch basin filtration system. Designed specifically for open curb inlets, the kit includes a cartridge basin with modular filters or sediment sack, four supporting cleats, two aluminum rails, two mounting flanges, and one flow collector assembly with hardware. The system captures trash, debris, sediments, oils, grease, and soluble metals. Filters incorporate antimicrobial treatment that inhibits bacteria, virus and mold growth. 800/321-7870, ext: 659; www.transpo.com. ♦

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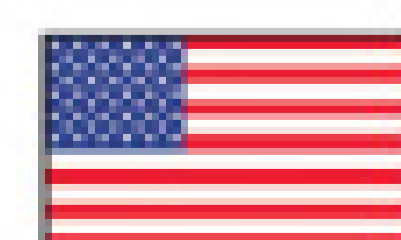
The Pathfinder is designed and manufactured in the U.S.A. by Aries Industries, Inc. The high resolution camera module and high intensity LED lighting let you see details that other cameras miss. The brushless drive motors and electronic clutches in the tractor yield longer life, less maintenance and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

Zoom Pole Camera

Aries high resolution camera module used in conjunction with the 432:1 zoom ratio and High intensity detachable LED lightheads, allows you see details that other cameras miss. The wireless operation makes the system extremely versatile and allows you to take it anywhere and transmit the video anywhere. When this system is used with the optional media case with 10" day light readable screen, it allows the user to inspect any pipe anywhere you can get to. For more versatility virtually any reporting software can be added to greater enhance the systems capabilities.



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USER:
City of Lebanon (Tenn.)
Sewer Department

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treatment plant sludge

BENEFITS:
Sludge within proper mixed
liquor suspended solids range,
better dissolved oxygen profiles,
lower sludge blankets, and higher
flow rates through the plant

MANUFACTURER:
Flint Industries Inc., Metter, Ga.

WEB SITE:
www.flintusa.net

The header configuration pumps water-soluble, emulsion-polymer conditioned sludge slurry to one 60- by 100-foot-long TitanTube, while dewatering occurs.

BETTER THAN MOBILE

A passive dewatering device helps a city in Tennessee bring activated sludge inventory into its proper mixed liquor suspended solids range

By Russell Pickett

“One major benefit of tube technology is that the dewatering surface area is hundreds of times larger than a belt press. If necessary, we can dewater at up to 600 gpm.”

Billy Dranes

The Sewer Department of Lebanon, Tenn., operates an extended air-activated sludge treatment plant. Excess solids under aeration were cycling up, but the one-meter belt press could not run fast enough or long enough to dewater the inventory.

Superintendent Billy Dranes consulted Liquid Solids Separations in Butler, Tenn., which recommended geotextile tubes as a more cost-effective dewatering technology than contracting for a mobile belt press.

Three 60- by 100-foot-long TitanTubes from Flint Industries Inc. brought the sludge inventory

into the proper mixed liquor suspended solids range within two weeks. The dewatering process also achieved better dissolved oxygen profiles and lower sludge blankets, resulting in optimal sludge settling and higher flow rates through the plant.

Methods and materials

With one tube in reserve, city workers laid the other two on an existing concrete pad at the plant, then connected them to the building with 3-inch Schedule 40 PVC pipe. A header pumps sludge to one tube, and dewatering occurs at the other. Sludge was pumped continuously at 40 gpm during the day

until levels reached the proper range for air requirements and sludge settling characteristics.

Based on laboratory results, two cationic emulsion polymers were selected for the dewatering project. “The first was the captive polymer we use in our belt press,” says Dranes. “It has a medium to high charge with a high molecular weight. The second polymer was selected for field evaluation. It has a medium to high charge with a low molecular weight.”

The captive polymer proved superior because the floc did not shear down and lose conditioning. If polymer conditioning is incorrect, Dranes notes, sludge will clog



The captive polymer — a medium to high charge with a high molecular weight — proved superior because the floc did not shear down and lose conditioning.



The result of using the second polymer — a medium to high charge with a low molecular weight — on the conditioned slurry.

the geotextile fabric and prevent dewatering.

How it works

The conditioned slurry is pumped into the tubes, which retain the floc solids, but allow water to seep through the porous fabric. "One major benefit of tube technology is that the dewatering surface area is hundreds of times larger than on a belt press," says Dranes. "If necessary, we can dewater at up to 600 gpm."

After 45 to 60 days, the dewatered sludge is dry enough for removal. Dryness is checked by inserting a Sludge Judge through the port where the slurry was introduced. Tubes are opened, and the 120 tons of dry material, as well as remnants of the tube, are transported to a landfill.

The project cost less than \$9,000 including setup, personnel training, consulting fees, TitanTubes, and piping. Lebanon personnel provided the labor. "Contracting for a mobile belt press and crew would have cost \$10,000 per week for a minimum of three weeks," says Dranes.

The plant is dewatering 24 hours per day without odors or vectors. The tubes also can be used for hazardous waste containment, or provide a low-cost dredging and dewatering option for bio-treatment lagoons. ■

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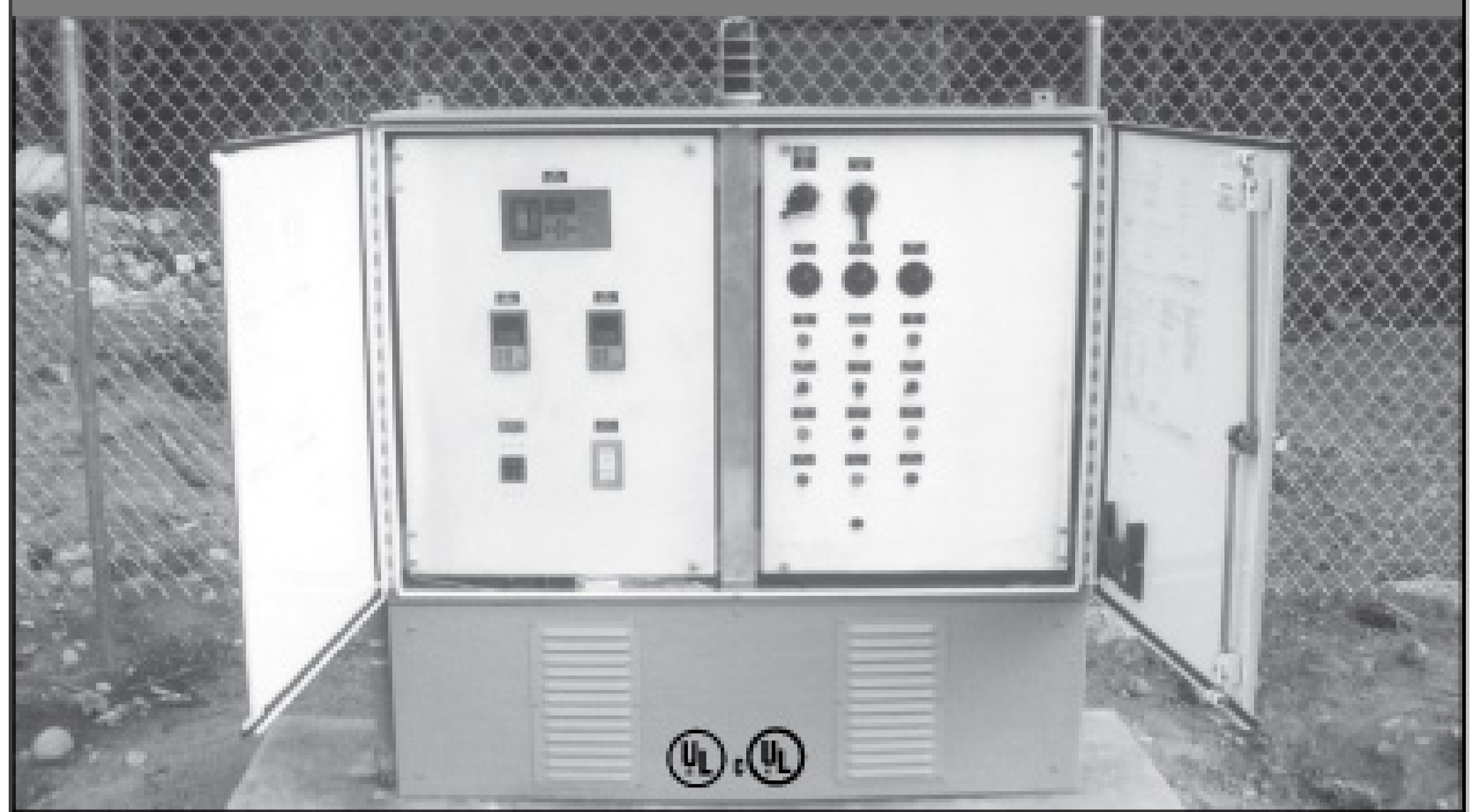


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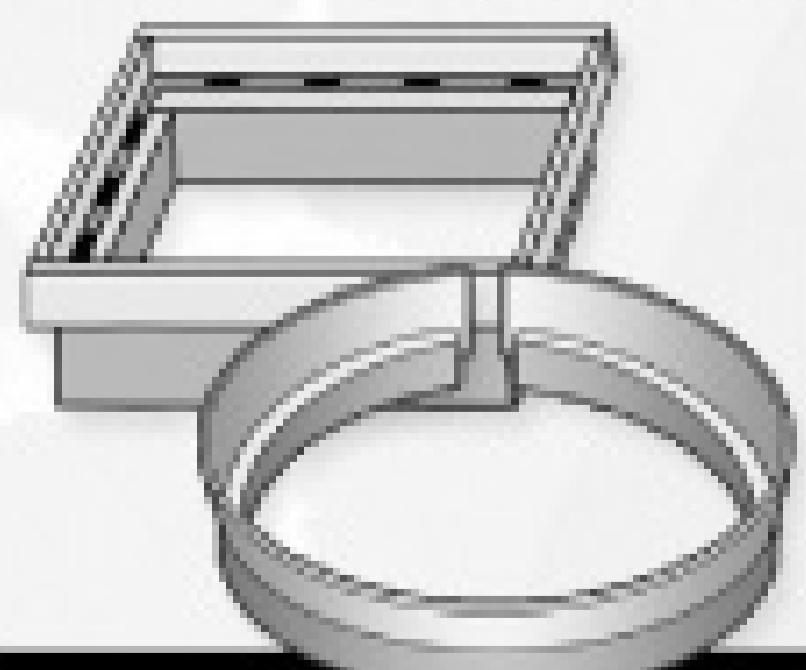
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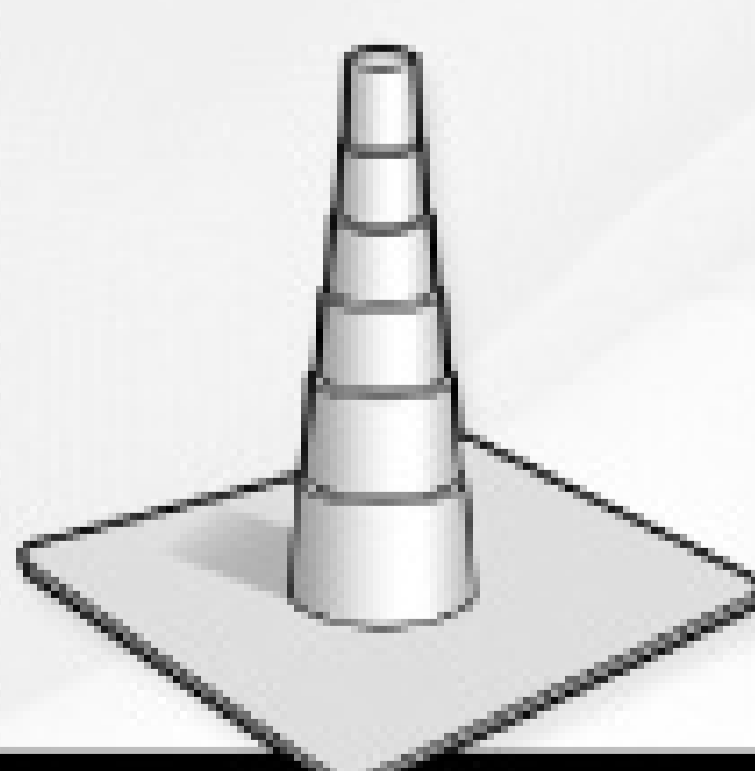


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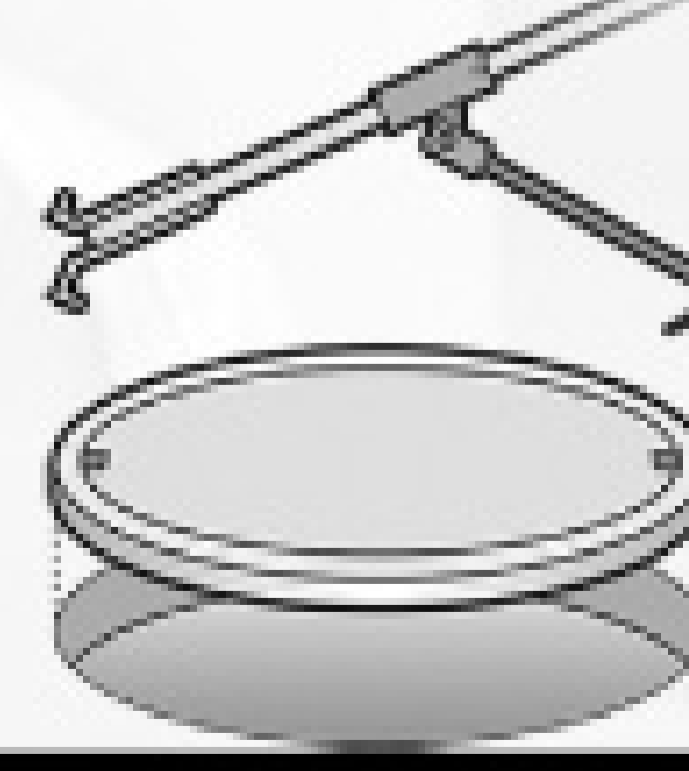
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This adaptation uses the least amount of space of the bed-mount configurations. The ERV-750 folds away neatly, length-wise along the sidewall of the truck bed.

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This is another efficient configuration for those that need all of the pick-up's bed space. Also comes with the Wachs EZ Attach/Detach System.

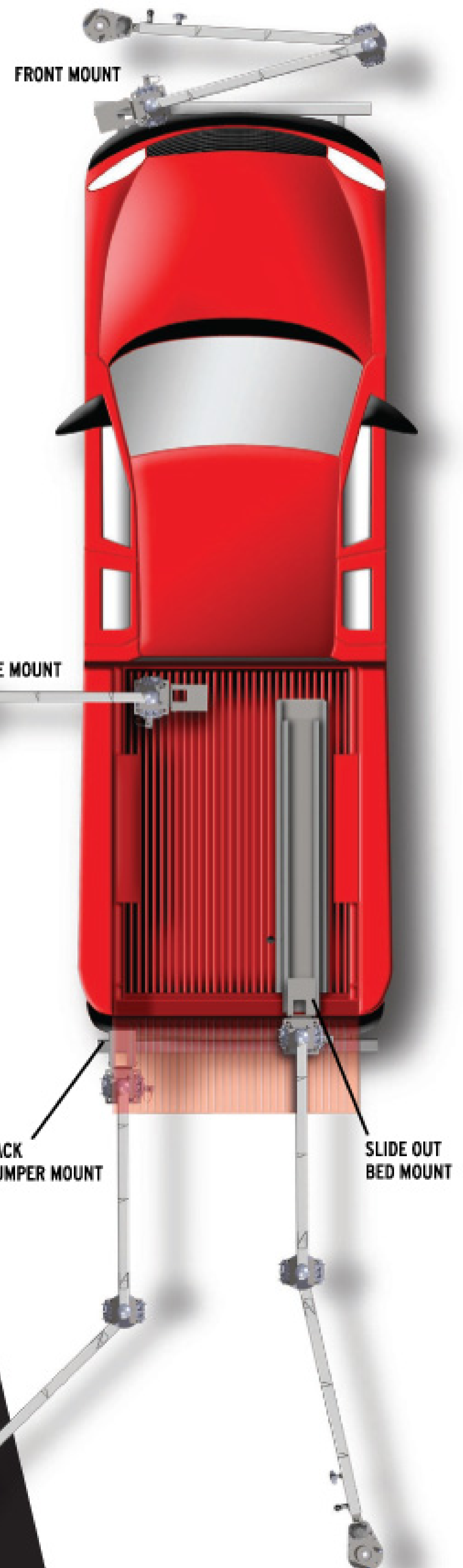
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ALL IN ONE

The HIPPO multipower system provides electricity, hydraulic power and compressed air in a package designed for use in remote locations

By Gil Longwell

Tools, power and sometimes auxiliary lighting are essential supports at every remote utility worksite. The challenge is making the full range of power sources conveniently available when beyond the easy reach of utility electricity and when terrain and working conditions are difficult.

The HIPPO multipower system, manufactured by Mobile Hydraulic Equipment Co. LLC is a truck-mounted power plant designed to bring continuous supplies of electricity, hydraulic power and compressed air wherever the truck can be driven. It enables utility crews to use power tools best suited for the job, regardless of the power source those tools require.

Paul Williams and Amos King, equipment operators with the City

of Lancaster (Pa.) Water Transmission and Distribution Department, demonstrated the system. The city operates two of the HIPPO power units, one built on a 2003 International, and the other on a 2005 International platform. In all other respects, the two are essentially identical. Both were demonstrated; one in actual use, the other in simulations.

Walk-around

The 2005 International 4300 4x2 (SA475) chassis is rated for a GVW of 25,500 pounds. It has a 181-inch wheelbase and a 114-inch cab-to-axle length. Powered by a Detroit DT466 electronically controlled 215-hp diesel engine with 560 pound-feet of torque at 1,400 rpm, the unit has ample power for the Allison MD3060P close-ratio 5-speed automatic transmission with PTO gears. The Parker-Chelsea PTO drives a commercial hydraulic gear pump.

The multipower unit has a Van-Air hydraulically driven rotary screw air compressor that delivers a sustained 185 cfm at 110 psi. A hydraulically powered Tendaire 6 kW generator supplies 110V and 220V outlets. The remainder of the hydraulic pump output supplies three fully adjustable, variable-flow hydraulic circuits which, depending on the tools' demands, could support up to three devices.



Amos King, equipment operator, makes adjustments at the HIPPO control panel, where all three energy sources are controlled. (Photography by Gil Longwell)



The HIPPO panel puts all controls at the operator's fingertips and at eye level.

TECHNOLOGY TEST DRIVE

EQUIPMENT:
HIPPO multipower model 6033

MANUFACTURER:
Mobile Hydraulic Equipment Co. LLC,
Kansas City, Mo.
816/474-2034
www.hippopower.us

LOCATION OF DEMO:
Lancaster (Pa.) Water Transmission and Distribution Department

DEMONSTRATED BY:
Paul Williams and Amos King, water department operators

LIST PRICE:
\$128,000 as demonstrated, including vehicle

The various power outlets — air, hydraulic and electric — are positioned both at the control panel on the curb side (passenger side) of the vehicle and at other key locations around the body.

International delivered the unit with all drive-train mechanicals installed except the PTO. Mobile Hydraulic installed the PTO, the power unit, and a Knapheide model 6133HC line body. This utility body provides weather-protected storage space for air, hydraulic and electric tools, and for a generous assortment of parts.

The high-wear surfaces of the body, such as the tops of the side storage boxes and the central storage bed, are coated with sprayed-on Line-X abrasion resistant material.

Hose handling is accomplished by two 50-foot spring-return hose reels from Hannay Reels. One

serves the high-pressure air delivery system and the other manages supply and return hoses for one hydraulic circuit. The reels are mounted to the top of the storage body. Also mounted to the body is a 3,200-pound-capacity Venturo

Amos King spools out tandem hydraulic hoses (supply and return) to power a hydraulic ram.



Crew member Tom Haddad readies a McLaughlin hydraulic ram, used to drive a rod under an obstruction (like a road) as part of a replacement pipe insertion project.

radio with clock, and air suspension. Safety and performance equipment includes heated mirrors, two-speed intermittent wipers, and a hydraulic disc brake system with ABS.

Operation

The demonstration began at the public works garage, where King first loaded a hydrauling directional ram. Used to drive a rod under a street or other obstacle and then to pull a replacement water or sewer pipe through the newly created channel, the frame-mounted ram from McLaughlin Boring Systems was stored in an out-of-the-way corner inside the garage.

Although the garage presented a somewhat restricted overhead space, the crane easily lifted and

then rotated to position the 350-pound load in the truck's open bed. At the field demonstration site, King unloaded the ram and placed it in position in an open excavation. Crew member Tom Haddad then made the hydraulic connections in less time than the unloading process had taken. With King at the power unit control panel and Haddad operating the ram, work was under way in about 10 minutes.

The morning demonstration followed a night of near-freezing temperatures. The cold required a less-than-full-throttle startup of the hydraulic pump. (Hydraulic oil thickens when cold, and while the pump quickly gets the system up to operating temperature, a prudent operator does not abuse hydraulic

equipment by going "pedal to the metal" on cold mornings.)

Next, King retrieved an air-powered jack hammer from an equipment locker. In less than a minute he had laid out the air hose and had the tool chattering away as he broke up a slab of concrete.

This demonstration took place at a storage yard, where space for equipment was not an issue. The next worksite was at a busy intersection where an old fire hydrant had become too difficult to operate to be left in service. The close proximity of the hydrant to the corner limited the number of public works vehicles that could get close to the work site at any time.

Public buses, school children crossing the street with a crossing guard, early morning traffic, and Williams' crew competed for the limited space. In addition to the HIPPO unit on the 2003 chassis, a backhoe, dump truck and service vehicle were onsite or holding nearby. In spite of this crowd, the work area remained clean and traffic disruptions were minimized.

On this site, the HIPPO crane unloaded the new hydrant from the truck to a ready position on the ground, steadied the old unit while crew member Angel Rivera entered the excavation to disconnect, then lift the old unit out. With the old one clear, the new unit was lowered into position and supported while it was attached to the main. The crew then backfilled and tamped the excavation.

ET10KX electric/hydraulic crane.

Driver comforts include factory air conditioning, an AM/FM stereo



Operator Amos King (left) and water transmission and distribution supervisor Don Kirchner review the crane's tethered control system.



Don Kirchner (left) and King insert the crane control cable in preparation for a lift.



The crane's master disconnect switch protects the equipment from unauthorized use.



King connects the compressed air system to a jackhammer.

At both sites, an excavation with a backhoe was necessary. Each backhoe traveled to the jobsite under its own power. With a towing capacity of 20,000 pounds, the truck carrying the power unit could have towed these machines to a jobsite.

Connecting tools to any of the three types of power outlets was quick and easy. Crew members showed how all three energy sources are hooked up using industry-standard connectors.

King showed the outlets that accommodate 110V or 220V through

“The machine is compact and mobile. Everything is right there with me no matter where we go. When we are out in a field after dark fixing a water main break, the auxiliary lighting is not a luxury, it is a necessity.”

Amos King

voltage-specific receptacles and the two hose connections for the closed-loop hydraulic circuits — one for supply and one for return hydraulic fluid. Compressed air connections are provided for tools requiring different air volumes and therefore different connection devices.

Crew members demonstrated how the built-in hose reels enabled rapid hose deployment and retrieval and quick connections. Manually deployed hoses and extension cords can be used as well.

Observer comments

The HIPPO unit eliminates the need for a convoy of support vehicles and tow-behind auxiliary power plants. This well-stocked truck, carrying a full assortment of electric, hydraulic and air operated tools and a generic set of standard repair parts, would help keep a crew fully deployed and productive for an entire workday. The truck's large-capacity fuel tank provides a day-long fuel supply.

Disaster and emergency response teams would find value in the unit's versatility and staying power. Any of the hydraulic cir-

cuits can power a hydraulic intensifier, which is a secondary hydraulic pump. This in turn can power an extraction device such as a Jaws of Life unit.

If work site lighting is permanently mounted, these lights can be wired into an onboard electrical distribution panel or energized through manually inserted plugs.

The greatest obstacle to full utilization of the power unit would be the unavailability of tools. Ample storage space onboard should make this a non-issue in all except highly unusual cases.

Manufacturer/operator comments

“The unit can be mounted to almost any chassis so long as it can supply the power needs,” says Jeff Givens, president of Mobile Hydraulic Equipment. “Every unit and vehicle can be designed from the tires on up by the customer.”

The chassis, engine and drive train, PTO, hydraulic-driven pump, air compressor, generator and utility body are all essentially options, which the customer can select from a preferred list of suppliers.

“We work diligently to standardize as many parts as possible across the entire product line,” says Givens. “This reduces our unit cost, and we pass those savings along to our customers. Customers, in turn, have few spare parts to keep on hand. With overnight delivery, most customers are eliminating spares inventory.

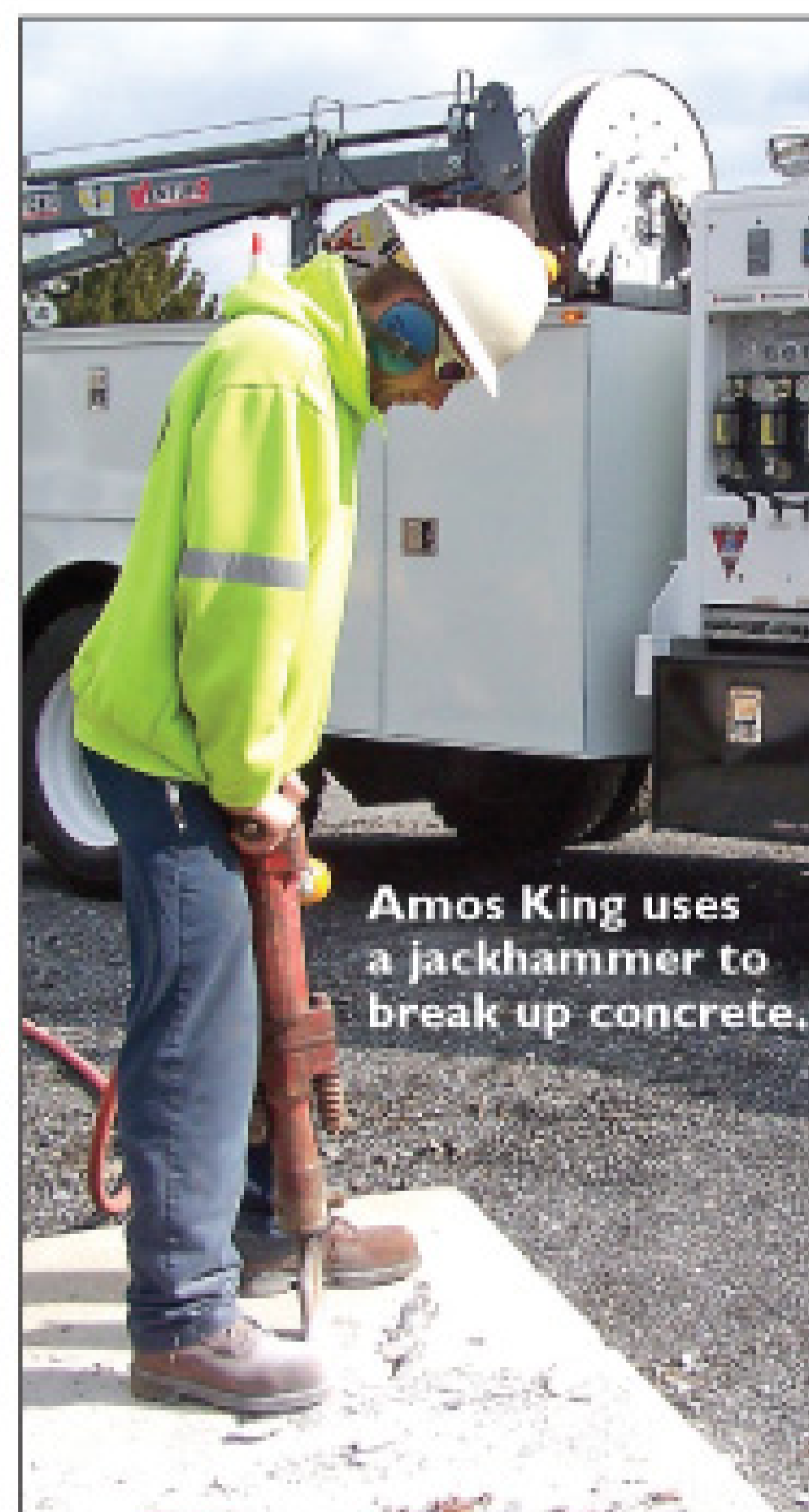
“Even with standardization, the type of hydraulic fluid in a unit can be customized. Some of our machines are put to work in fragile environments. The owners have chosen to specify EnviroLogic 132 biodegradable hydraulic fluid. This alternative to petroleum-

based fluids reduces the impacts of a potential spill.

“The development of the multipower unit sprang from several customers' needs. They wanted to get away from multiple auxiliary-powered tow-behind units and move to a single consolidated unit that would satisfy all their remote power needs.”

City water transmission and distribution supervisor Don Kirchner says the city staff first saw the machine at an American Public Works Association conference. When he showed the device to Donna Jessup, public works operation supervisor, and Charlotte Katzenmoyer, public works director, they said, nearly in unison, that the unit would help cut travel costs and reduce equipment overhead and inventory.

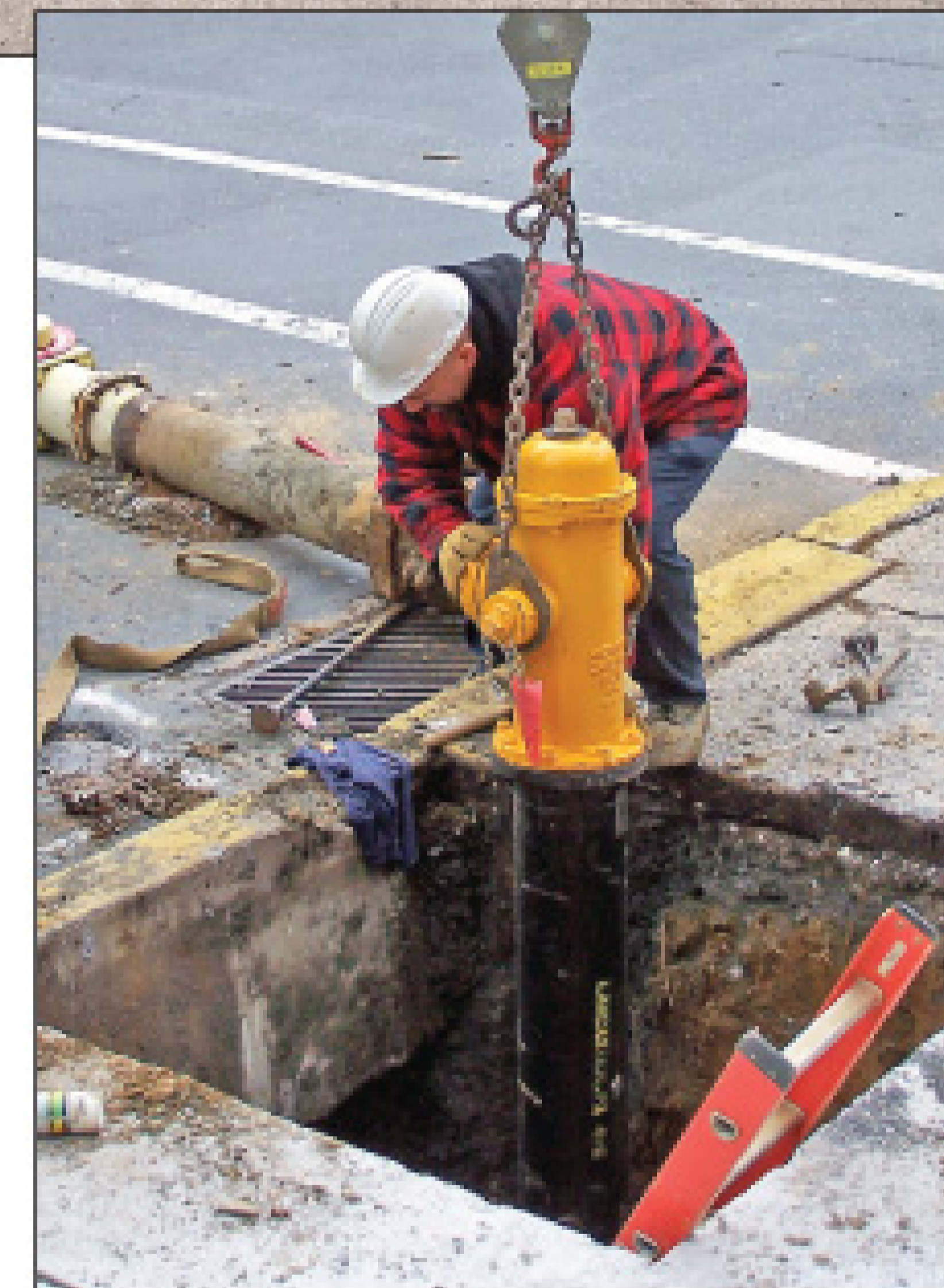
Operator Williams observed, “This machine lets us handle a lot of different jobs from the same truck.” He reports using an air wrench to open or close curb stops when muscle power alone would not do the trick.



Amos King uses a jackhammer to break up concrete.

King adds, “The machine is compact and mobile. Everything is right there with me no matter where we go. When we are out in a field after dark fixing a water main break, the auxiliary lighting is not a luxury, it is a necessity.” ♦

The HIPPO system powers a wide range of electric, hydraulic, and air-driven tools. (Photo courtesy of Mobile Hydraulic Equipment Co., LLC)



Crew member Jorge Vazquez guides a new hydrant into position. Lifted and maneuvered by the HIPPO's onboard crane, hydrant removal and installation were handled with a minimum of muscle power.

MORE INFO:

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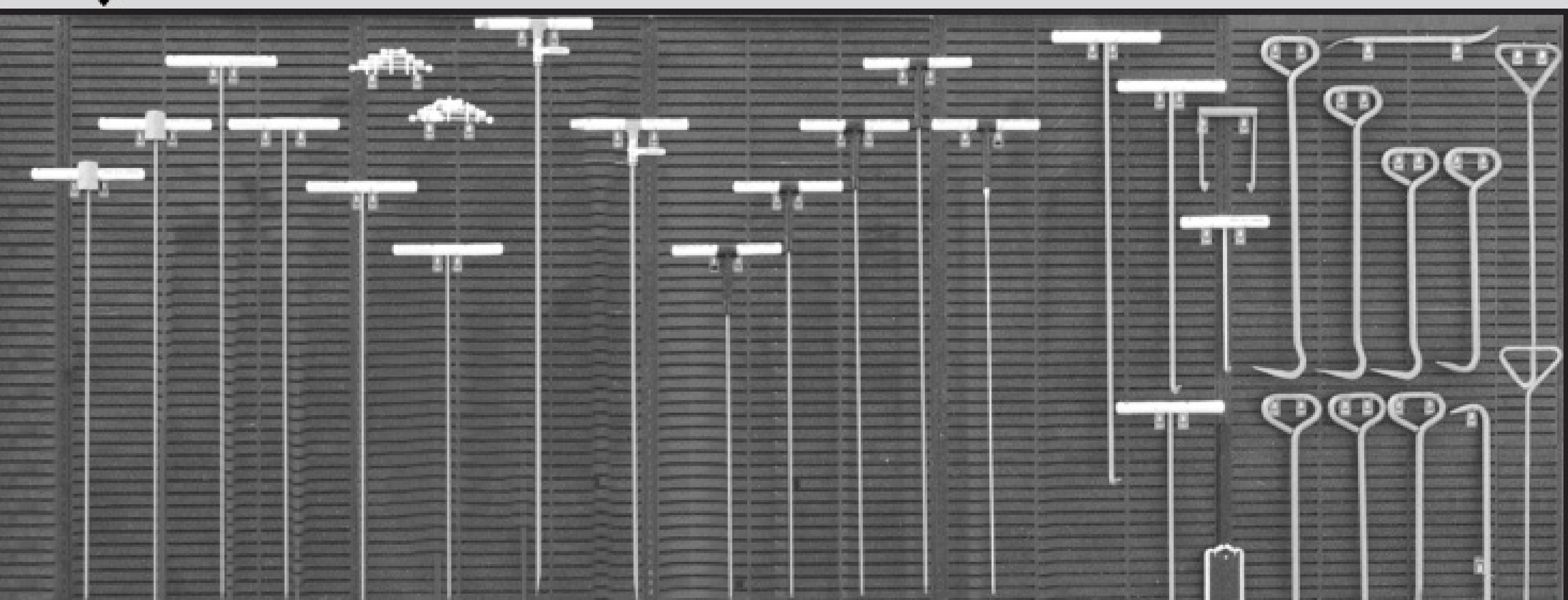
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LEARNING TO LET GO

Delegating authority is not a single action but a process. Here are the basic steps to follow for delegating in a way that gets results.

By *Christi Youd*

If you're one of the many professionals today trying to do more in less time, you know delegation is a must. Unfortunately, many people say they dislike delegating. They fear that the task they delegate will never get done, or that it will get done, but not to their liking. As such, they refuse to delegate anything to anyone unless absolutely necessary.

The reality is that failure to delegate causes more stress and leads others to believe that you don't trust them or don't want them to take on new responsibilities. That's when people view you as a "control freak" who refuses to let anything go.

The good news is that effective delegation follows a simple process that anyone can learn. Whether you are a director overwhelmed with deadlines and meetings or a supervisor trying to stay on time with multiple projects, these tips will enable you to delegate effectively and be more productive.

1. Be committed to the full delegation cycle. Proper delegation is actually a cycle with four points. The task comes to you from some other source, such as a supervisor or customer. You then delegate all or parts of the work to someone else. That person in turn reports back to you periodically on progress. Finally, you receive the finished product and report to the

original source of the assignment. Be sure to complete all four points of interaction for every assignment you delegate. If you neglect any one of them, the process breaks down, and delegation fails.

2. Delegate in writing. Often, delegation breaks down because the person you delegate to is unclear on the details of the assignment. Rather than ask for clarification (and possibly appear incompetent), the person sits on the job, hoping you will give some additional clues about what you really want.

That's why you need to put the instructions in writing. You can send a simple e-mail, or provide something more formal, such as a detailed process sheet. In writing the task down, you have to slow down enough to spell out all the details someone needs to complete the task successfully.

Your written note also provides guidance for the person who receives it. He or she then can refer back to your instructions as necessary and so stay on track. Yes, written delegation takes more time. But remember that for every minute you spend writing out the details, you might save an hour in execution.

3. Train your team members to report back on time. In your written instructions, be sure to tell people when you want them to

report back to you, both with progress updates and with the final product. Be specific. Rather than say, "Please give me regular updates on your progress," say, "Please provide a status update every Friday at 2 p.m. for the next two months, or until the project is completed." Being specific removes any guesswork and enables your team to live up to your expectations.

delegate an assignment and completely leave it up to the other person. Just as the person you delegate to needs to be accountable for reporting in, you need to be accountable for following up. Your reminder system can be your daily planner, your Outlook program, a tickler file, or any system that works for you. Make a note to follow up with a team member if you have not received the report,

The good news is that effective delegation follows a simple process that anyone can learn. Whether you are a director overwhelmed with deadlines and meetings or a supervisor trying to stay on time with multiple projects, these tips will enable you to delegate effectively and be more productive.

When team members report back on time, make a big deal about it. Thank them for completing the task and congratulate them for reporting back within the time frame you outlined. If they fail to report back on time, call them to account. If they completed the task but did not report back to you with the final product, point out that reporting is just as important as getting the task done. With every delegated assignment, reinforce the importance of reporting in a timely manner.

4. Use a reminder system to ensure proper follow-up. Never

update, or task as requested.

If you give the team member the deadline of Friday at 2 p.m. for a progress update, then enter into your own reminder system to follow up with the person at 4 p.m. if he or she does not meet the deadline. Give the team member the full opportunity to report to you before you track him or her down for follow-up.

Follow up only when the person misses a requested deadline. You don't want to train people that you will follow-up on a regular basis, as that leaves the responsibility with you. Rather, you want to

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.

train people that they are expected to report back to you.

If they don't report and you don't follow up, the cycle is broken and delegation fails.

5. Report back to the person you received the assignment from. The job is not done just because the delegated task is completed to your satisfaction. You need to complete the cycle by reporting back to the person who initially gave the task to you.

Tell your boss the findings. Give the customer the information he or she needed. Share your report with management. Keep the communication chain intact so that others learn that they can trust you as well.

If you want to free up some of your time so you can focus on your core duties, you need to delegate effectively. So examine your daily tasks and decide which ones someone else can do. Then delegate effectively. Proper attention to the delegation process pays great dividends in higher productivity, on-track company objectives, and reduced work-related stress. ♦

Christi Youd, trained by the National Association of Professional Organizers, is president of Organize Enterprise LLC (www.organizeenterprise.com). She is also author of *Organize Your Office for Success*.

Perma-Liner Becomes Insituform Distributor

Perma-Liner Industries Inc. has become a licensed distributor for Insituform Technologies Inc. and its products for rehabilitating sewer, water and other underground piping systems.

Vision Technology Selects Giveaway Winners

Steve Allen and Ken Davis of Allens Plumbing, The Drain Surgeon, in Hawaii and John Perkins from Washington University in St. Louis, Mo., were winners of the Vision Technology drawing at the 2008 Pumper & Cleaner Environmental Expo International in Louisville. They were chosen from among 150 entrants. Allen and Davis received an Intruder Elite camera system, while Perkins won a VT2000 water detector. ♦



Above, Steve Allen (left) and Ken Davis won an Intruder Elite camera system. At right, John Perkins won a VT2000 water leak detector.

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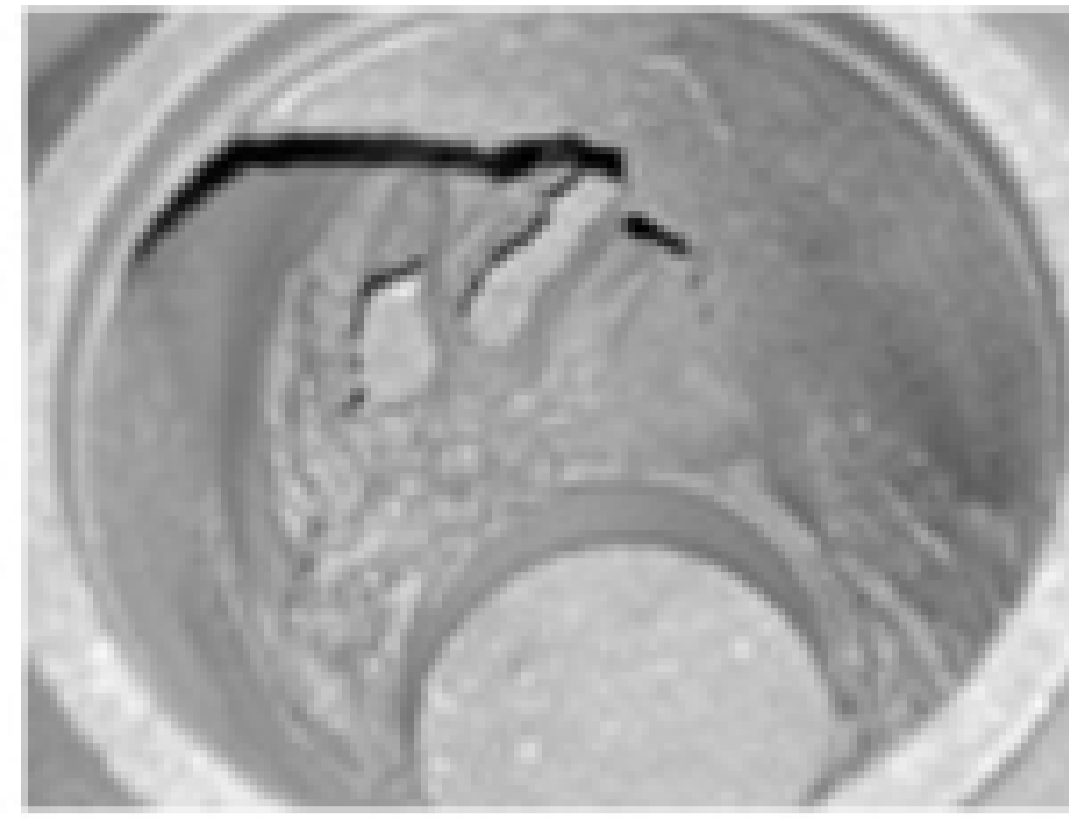


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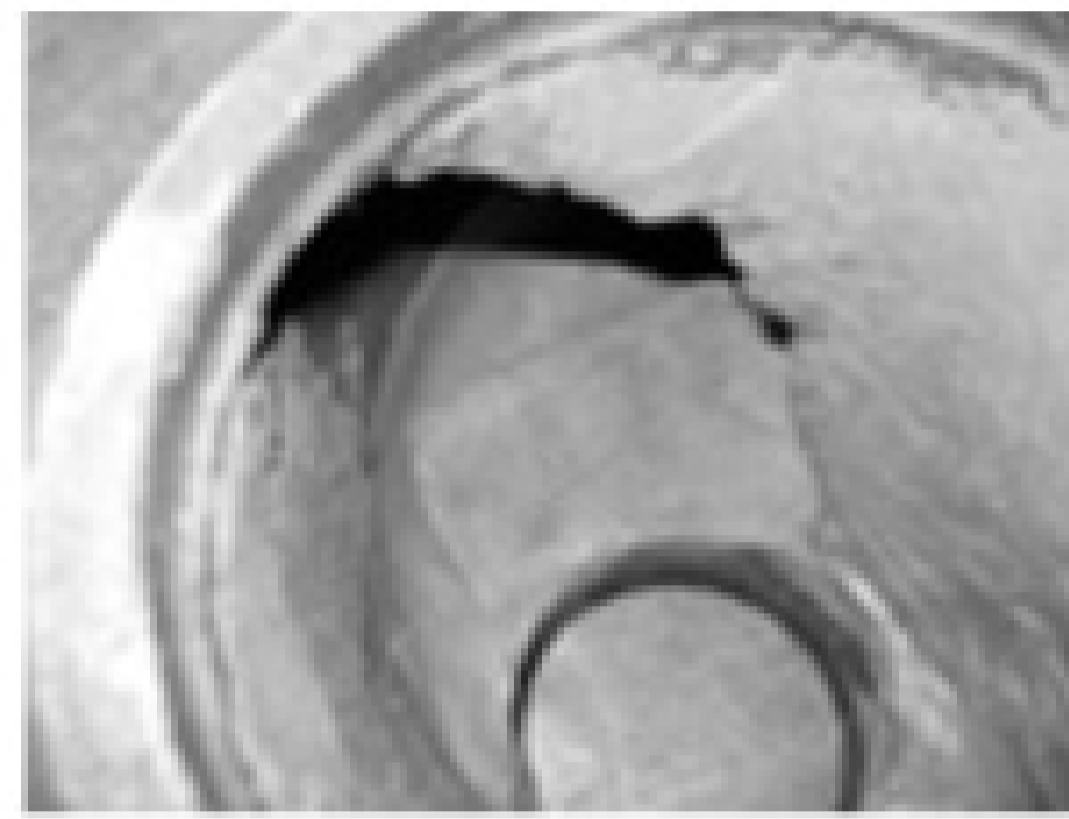
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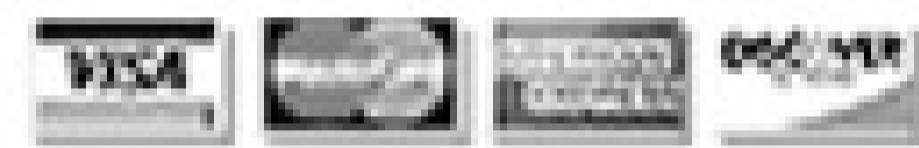
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1998 Vac-Con 2-stage combination cleaner, single axle, 9-yr debris body, International chassis w/62K miles, 65@2000 water pump, 1000 gallon poly tanks, front 600' extension hose reel, 6' boom extension, 1700 hrs. on auxiliary diesel engine, many extras, very good machine, city owned. \$73K OBO. Call Mark @ 515-681-6321. (C5)

1990 Aquatech B-10 (strong vacuum pump - new gear box), Meyers pump, 2000 psi, 80 gpm, International with automatic transmission. Price \$60,000. Call 503-969-9557 or 503-682-2723. (C5)

1997 VacCon V390THA on a Ford, 3-stage fan, articulating hose reel, extendible boom, new white paint. Located in Dallas. 972-938-1905. **www.empireequip.com.** (CPBM)

2002 VacCon V390LHA on a Sterling L7501, articulating hose reel, 10' extendible boom, 3-stage fan, pump-off system, 65 gpm, 3000 psi pump, new paint, excellent condition. Located in Dallas. 972-938-1905. **www.empireequip.com.** (CPBM)

VacCon model VPD4209 THA on a 1997 Ford, **PD blower**, 4200 cfm, articulating hose reel, extendible boom, new white paint. Was a city owned unit. In excellent condition. 972-938-1905. **www.empireequip.com.** (CPBM)

1998 Vactor 2110 on a Freightliner FL80, 28,213 miles, 2-stage fan, 80 gpm, 2,000 psi pump off system accumulator. Was a city owned unit. Located in Dallas. 972-938-1905. **www.empireequip.com.** (CPBM)

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2004 Vactor on International, 16" 1998 VacCon V312THA on a Ford LT8000, 3-stage fan, 65 gpm, 2000 psi pump, extendible boom, articulating hose reel, 12 yard debris tank, new paint. Was a city owned unit. Located in Dallas. 972-938-1905. **www.empireequip.com.** (CPBM)

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**KEEPING THE
GULF STREAM
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PAGE 16

Boynton Beach stormwater
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PPI Educational Awareness Campaign

The Plastics Pipe Institute (PPI) began an educational awareness campaign targeting city mayors and municipal staff members. The "Be A Hero — Building Community" campaign focuses on the benefits of high-density polyethylene (HDPE) pipe for water, sewer and stormwater systems, natural gas lines, and fiber optic cable runs.

"We undertook this initiative to call attention to HDPE pipe as the correct solution to rebuilding and modernizing America's disintegrating underground infrastructure," says Tony Radoszewski, executive director. Visit <http://plasticpipe.org> or call 469/499-1044.

Hearing Loss Prevention Award

The National Institute for Occupational Safety and Health and the National Hearing Conservation Association created the Safe-in-Sound award for organizations that have the best hearing-loss prevention programs. An additional award will be given for an innovation in hearing loss prevention such as a new product, training program, or software program. For more information, visit www.safeinsound.us.

Lifetime Achievement Awards

The American Society of Civil Engineers announced the winners of its Outstanding Projects and Leaders (OPAL) Lifetime Achievement Awards. The 2008 winners are:

- William H. Luytics III, P.E. — Construction
- Clyde N. Baker Jr., P.E. — Design
- Ernest T. Smerdon, Ph.D., P.E. — Education
- Gerald E. Galloway, Ph.D., P.E. — Government

- John M. Dionisio, P.E. — Management

To read a full account of their accomplishments, go to www.asce.org/pressroom/news/display_press.cfm?uid=4015.

Florida Scholarship Program

The Florida Stormwater Association is accepting applications to its scholarship program for students interested in stormwater research, management or finance. The application deadline is Aug. 8. Download the form at www.florida-stormwater.org.

Best Tasting Water

A panel of judges named West Anderson Water District the Best Testing Water in South Carolina for the second time. Entries are judged for clarity, smell, taste, and aftertaste. The contest is hosted by the South Carolina Rural Water Association. West Anderson Water District is managed by Steve Wilson. The system shares ownership over the Anderson Regional Joint Water System with 13 other water systems.

Wastewater Infrastructure Security

The American Society of Civil Engineers' Environmental and Water Resources Institute is conducting a public comment period on Guidelines for the Physical Security of Wastewater Utilities. The period ends May 20. The standard applies to physical security for wastewater treatment plants, collection systems, pumping stations, and wastewater/stormwater system support facilities. To participate, contact Phillip Mariscal at pmariscal@asce.org or call 703/295-6338. For more information on the standard, e-mail Karen Albers at kalbers@asce.org or call 703/295-6404.

LEARNING OPPORTUNITIES

UW-Madison Engineering Courses

The University of Wisconsin-Madison Department of Engineering Professional Development is offering the following CEU, LU, PDH classes at the Madison campus.

- May 8-9 – Preparing an Effective Municipal Capital Improvements Plan (J488)
- June 11-13 – Designing Wastewater Pumping Systems and Lift Stations (J796)

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

American Public Works Association

APWA has these courses as classroom workshops or audio/Web-based broadcasts:

- May 7-9 – Public Fleet Management Workshop, Grimsby, Ontario.
 - May 15 – Delta Force Readiness! Developing Tomorrow's Elite Corps of Public Works Leaders (Web).
 - June 12 – Developing a Successful Fleet Replacement Program (Web).
 - June 26 – Municipal Stormwater Self-Audit: A How-To Guide (Web).
- Call Carrie Merker at (816) 472-6100, ext: 5213 or visit www.apwa.net.

Joint Environmental Training Coordinating Committee (JETCC)

Programs are approved by Maine DEP for Wastewater Operator certification renewal credits. Some are approved by ME DHS for Drinking Water Operator (DWO) certification.

- May 8 – PVC Valves, Connections & Joining, Boothbay
- May 15-16 – Filament Identification, Portland

- May 20 – Pump Station Retrofits & Troubleshooting, Bangor
Call 207/253-8020 or visit www.jetcc.org.

American Water Works Association

The organization is offering the following CEU/PDH Webcasts:

- May 21 – Ductile Iron Pipe — Innovations and Technologies
- Aug. 6 – Pump Station Maintenance
Call 800/926-7337 or visit www.awwa.org.

Water Environment Federation

The WEF has the following seminars:

- June 10-11 – NPDES Permits Program Overview Course for Permittees – Including New and Emerging Issues, Milwaukee, Wis.
- June 18-19 – Asset Management for Water and Wastewater Utilities, New Orleans, La.
- June 24-25 – Fats, Oils, and Grease Management Training, Phoenix, Ariz.
Call 703/684-2441 or visit www.wef.org.

New England

The New England Interstate Water Pollution Control Commission (NEIWPCC) Training has the following courses.

- May 5- June 16 – Preparing for Your Grade 3 & 4 Operator Certification Exam, Hartford, Conn.
- May 6 – O&M of Wastewater Collection Systems, Pittsfield, Mass.
- May 8 – Get Control of Fats, Oil and Grease!, Concord, N.H.
- May 13-15 – O&M of Wastewater Collection Systems, Norwich, Conn.

CALENDAR

May 4-7

National Clean Water Policy Forum, Renaissance Mayflower Hotel, Washington, D.C. Call 202/833-2672 or visit www.nacwa.org.

May 18-21

Collection Systems, sponsored by the Water Environment Federation, David I. Lawrence Convention Center, Pittsburgh, Pa. Call 800/666-0206 or visit www.wef.org.

May 18-22

National Water Quality Monitoring Conference, sponsored by the National Water Quality Monitoring Council, Atlantic City (N.J.) Convention Center. E-mail Monitoring2008@wef.org or visit www.wef.org.

May 19-21

New England Interstate Water Pollution Control Commission Annual Nonpoint Source Pollution Conference, Mystic Marriott Hotel and Spa, Groton, Conn. Call Laura Chan at 978/323-7929 or visit www.neiwpcc.org.

May 19-21

American Backflow Prevention Association International Conference and Trade Show, Sheraton Keystone at the Crossing, Indianapolis, Ind. Call 979/846-7606 or visit www.abpa.org.

May 31-June 5

American Industrial Hygiene Conference and Expo for Occupational and Environmental Health and Safety, Minneapolis Convention Center, Minn. Call 703/849-8888 or visit www.aiha.org.

June 1-3

International Water Association-Water Environment Federation Wastewater Treatment Modeling Seminar, Château Mont-Sainte-Anne, Quebec. Call Bruce Johnson at 720/286-5373 or visit www.modeleau.org/WWTmod2008.

June 1-4

PennTec Annual Conference, Penn Stater Conference Center, State College, Pa. Call 717/642-9500 or visit www.pwea.org.

June 8-12

American Water Works Association Annual Conference and Exhibition, Georgia World Congress Center, Atlanta. Call 800/926-7337 or visit www.awwa.org.

July 15-18

National Association of Clean Water Agencies Summer Conference and Meeting, Hilton Hotel, Anchorage, Alaska. Call 202/833-2672 or visit www.nacwa.org.

Aug. 3-7

StormCon North American Surface Water Quality Conference and Exposition, Orlando World Center Marriott, Fla. Call 805/682-1300, ext: 129 or visit www.stormcon.com.

Aug. 17-20

American Public Works Association Congress: The Best Show in Public Works, Morial Convention Center, New Orleans, La. Call 800/848-2792 or visit www.apwa.net.

Sept. 7-10

WaterReuse Symposium, Hilton Anatole, Dallas, Texas. Call 703/548-0880 or visit www.watereuse.org.

Sept. 21-24

Distribution Systems Symposium and Exposition for Distribution, Engineering and Plant Operations Professionals, Austin, Texas. Call Tricia Loughead at 800/926-7337 or visit www.awwa.org.

Sept. 30-Oct. 3

Wisconsin Wastewater Operators Association Conference, Holiday Inn, Stevens Point. Call Richard McKee at 608/795-0024 or visit www.wwoa.org.

Oct. 5-8

National Rural Water Association Convention, Reno, Nev. Call 800/545-1054 or visit www.nrwa.org.

Oct. 18-22

Water Environment Federation WEFTEC conference, Chicago, Ill. Call 800/666-0206 or visit www.weftec.org.

Jan. 17-20

Utility Management Conference, Hotel Monteleone, New Orleans, La. Visit www.awwa.org.

- May 20-22 – O&M of Wastewater Collection Systems, East Providence, R.I.
- June 11 – Care of Emergency Generators, Millbury, Mass.
- June 11-13 – Preparing for Your Grade 1 & 2 Operator Certification Exam (with Math), Hartford, Conn.
- June 12 – Operation and Maintenance of Centrifugal Pumps,

- Millbury, Mass.
 - June 17 – Geographic Information Systems (GIS) for Wastewater Collection Systems, Hanover, N.H.
 - June 24-26 – O&M of Wastewater Collection Systems, Buffalo, N.Y.
- For information, call 866/824-9656 or visit www.neiwpcc.org/training/schedule.asp. ♦

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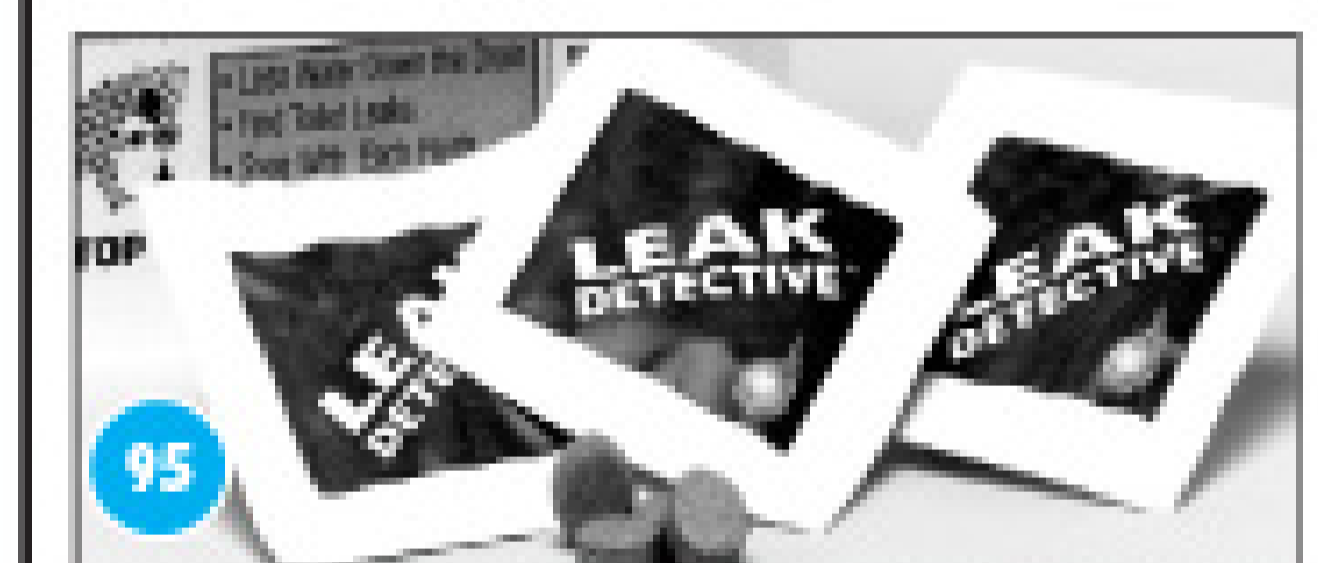
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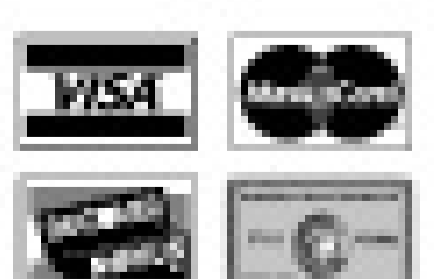
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LOOKING BACK WHILE MOVING FORWARD

A NASSCO membership can help pipeline repair professionals use their knowledge and experience to build a successful future

By Irv Gemora

Not a week goes by where I don't think how lucky I am to be in this position. As executive director of NASSCO, the leading trade organization for the sewer and water pipeline maintenance and rehabilitation industry, I can help my industry grow and simultaneously give back to my profession.

I call myself a sewer rat, having spent many years working in the field, learning the trade and getting my hands and the rest of me dirty. That firsthand knowledge was essential in helping me see and understand the technical part of rehabilitation.

Back then, we didn't have the procedures and extensive documentations that we do today. A lot of learning happened on the spot. One not so technical lesson I learned the hard way was that it is dangerous to focus so intently on working on a lateral in a large-diameter sewer that is directly opposite another. The unexpected flow down my neck and back was an unforgettable lesson.

Looking back on my career experience has guided my efforts to move our industry forward. The trenchless technology industry is fairly young, but boy have we grown in the past few decades.

For example, when NASSCO was formed in 1976 it was primarily a contractor-based organization. In the past five years alone our membership has doubled and includes a diverse group of contractors, manufacturers, engineers, municipal managers, and academics. We're on course to double our membership again in a few years, bringing our total to more than 600 members.

Today's sewer rats have all kinds of technical information at their fingertips, largely due to NASSCO's efforts in training, education and networking opportunities. Here are just a few examples of the technical information NASSCO provides:

- Specifications guidelines
- Sewer Jetting Code of Practices
- MACP/PACP/LACP reference manuals with training
- Manual of Sewer Condition Classifications

NASSCO also offers an array of training opportunities, such as PACP, MACP, and Inspector Training for CIPP.

What does this all mean to today's budding and experienced sewer industry professionals? It means you can embrace this information and use it to grow in your

career and build your business.

The PACP program is now recognized in North America as the standard for assessing the condition of pipelines. Our new Inspector Training for CIPP is the first of its kind, and I expect it to be embraced like PACP or even more. I know this because I still have my eyes and ears in the field.

If you're a seasoned professional, you still have more to learn. A wise man said, "You can never step in the same river twice," and that is true of our industry. The best way to keep up with it is to embrace the training and education that are at your fingertips.

2008 is an exciting year at NASSCO with a record-number of training and education opportunities, new office space, and much more. If you're not already a member, I welcome you to join us.



Members tell me over and over that the networking alone is worth the membership fee.

Many others tell how being a member of NASSCO has helped their careers and their businesses. I invite you to reflect on your experience, invest in your education, and propel yourself into a successful future. I'm proof that it works. ♦

Irv Gemora is executive director of NASSCO. He can be reached at director@nassco.org. The new NASSCO headquarters is at 11521 Cronridge Drive, Suite J, Owings Mills, MD, 21117. Call 410/486-3500.



JOIN THE UNDERGROUND

Until now, NASSCO, Inc. has been a well kept secret - but all of that is changing. Through our continued dedication to training programs, education, and networking among sewer service professionals, the secret is out: To compete in this marketplace, you need to have access to NASSCO's growing list of training, education and assessment tools, including the soon-to-be released Inspector Training Certification Program (ITCP) and the Trenchless Assessment Guide to Rehabilitation (TAG-R). Become a part of the movement and join NASSCO, the industry's leading association, today.

For information on member benefits, training programs, and to complete an application online, visit our Website at www.nassco.org or call us at 1.410.486.3500.



SETTING THE INDUSTRY STANDARDS FOR THE REHABILITATION OF UNDERGROUND UTILITIES

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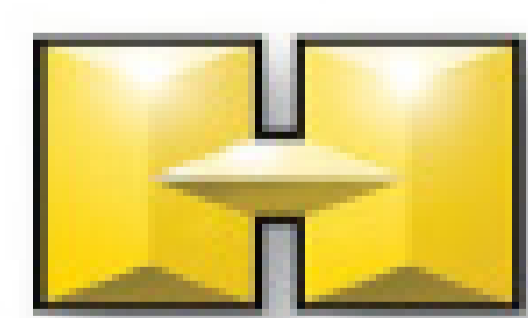
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