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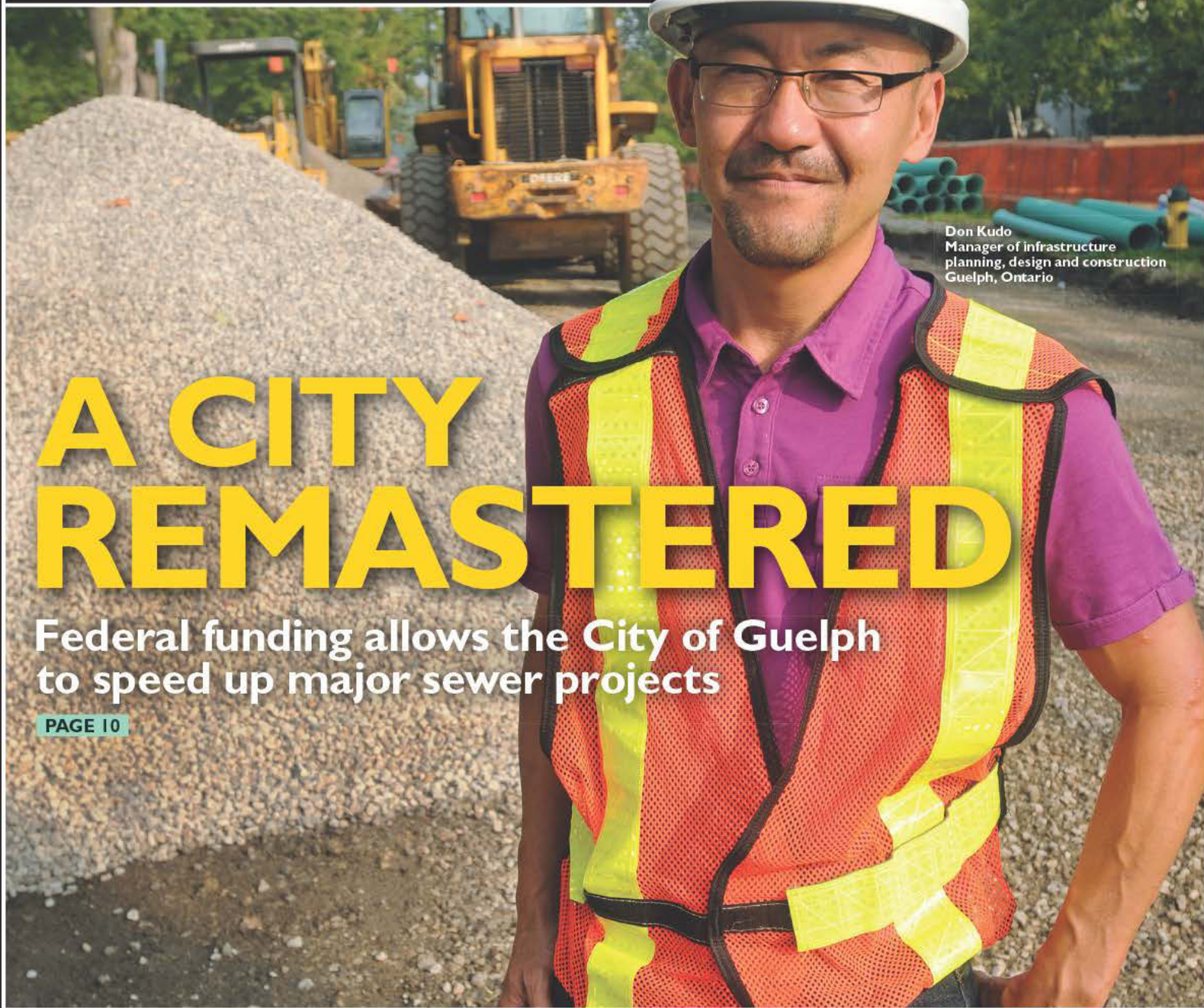
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Don Kudo
Manager of infrastructure
planning, design and construction
Guelph, Ontario

A CITY REMASTERED

Federal funding allows the City of Guelph
to speed up major sewer projects

PAGE 10

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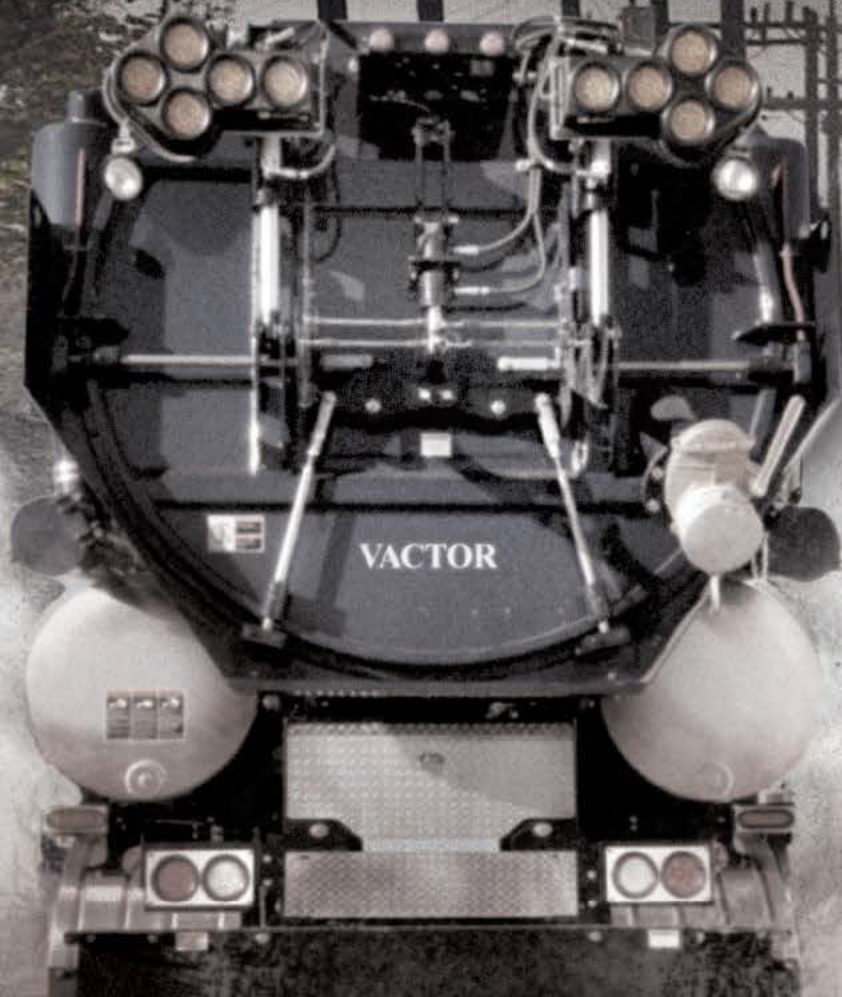
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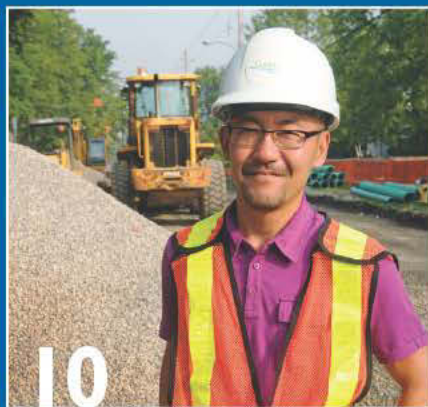
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MANHOLES AND CATCH BASINS/ PUMPER & CLEANER EXPO RECAP



COVER:

Don Kudo, manager of infrastructure planning, design and construction with the City of Guelph, stands amid one of the many sewer and water main infrastructure programs the city has undertaken over the past year. (Photography by Tony Saxon)



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INVENTED HERE

Public agencies should be proud of the ingenious people who use their experience to invent tools that help make systems better

Each year the Pumper & Cleaner Environmental Expo is filled with new products and technologies that can help cities and utilities do a better job maintaining and repairing their infrastructure.

Many of these innovations come from major manufacturers and software developers who show up with large booths and a dozen or more exhibit staff. Others come from startup companies in the basic 10-by-10 booth along a back wall.

Just where do all these ideas originate? Fairly often, they start in the mind of a water or wastewater employee who sees a problem in the field and just can't rest until it is solved. Of course, once they solve it, they may

have an idea for a commercially viable product. And that is where the real challenge begins.

Dangerous gaps

Ask Jerry Taylor, a supervisor with the Cincinnati Department of Public Works. He was concerned when thieves began taking storm sewer grates — of all things! — to sell for scrap. Imagine the hazard created by a large rectangular opening in a street. Just picture a car going down the right lane of a street in traffic and having its front wheel drop into a chasm. Instant calamity, serious injury, maybe a big lawsuit.

Taylor saw the danger and looked around for a remedy. Perhaps not surprisingly — given that such thefts had not been terribly common — he found none. So he invented his own. You can read about it in our Brainstorms feature in this issue of *MSW*.

Now that he has an idea, a prototype and a few production units, how does he get to the next level — the point where he can actually market, mass-produce and sell his storm sewer grate lock? It's not easy. And how many good ideas never become real simply because the inventors couldn't make the long journey from concept to market?

Simple yet great

Look around the industry and you'll likely see a few inventions offered by tiny companies involving maybe not much more than one person. I've seen them over the years. They don't need to be elaborate or high-tech to have merit.

Goodbye and Good Luck!

This issue and this column mark the end of my six years as editor of *Municipal Sewer & Water* magazine. I am on to new responsibilities with COLE Publishing, most notably launching another new magazine, *Water System Operator (WSO)*, for drinking water professionals.

Luke Laggis takes over as editor with the May issue. Please give him a warm welcome.

I've enjoyed editing this magazine, meeting some of you at the annual Pumper & Cleaner Expo, and talking to many others on the phone. I hope *MSW* has helped you in your career endeavors and continues to do so.

As always, COLE Publishing welcomes your thoughts on how *MSW* can serve you better. Please send your ideas to editor@mswmag.com; Luke will see them there. Here's wishing you much success in the future.

— Ted J. Rulseh



FROM THE EDITOR

Ted J. Rulseh

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TAKING ON A NEW CHALLENGE

This issue marks a changing of the guard for *MSW*. Ted Rulseh, who has been at the helm of this publication since its inception in 2006, has moved on to other duties with COLE Publishing that include editing *Treatment Plant Operator* magazine and the brand-new *Water System Operator*.

I come to *MSW* with well over a decade in the news business, including coverage of water and wastewater issues across many municipalities. I've reported on everything from flooded storm sewers and failing lift stations to the planning and construction of a new \$25 million wastewater treatment facility in my hometown of Rhinelander, Wis. I've also served as editor of *Cleaner*, another COLE publication, since September.

As we move forward, I'll do my best to make sure *MSW* continues to deliver information of value to the industry, including profiles of the people and departments that are shaping the future for sewer and water utilities. If you have comments, suggestions or story ideas, please feel free to email me at editor@mswmag.com. I hope to hear from you.

— Luke Laggis

I've seen various iterations of manhole cover lifters, designed to take the strain off workers' backs. I've seen inflow prevention pans that drop into manholes and just sit below the cover, stopping stormwater from running down into the pipe. A personal favorite is the guard that slips into an

open manhole and creates a barrier to keep workers from stepping into the hole.

It's a favorite because once, during a demonstration of a pipe cleaning and inspection technology, I almost stepped back into an open manhole. I remember feeling an instant's vertigo as my foot hovered over the abyss. Maybe sewer workers in time develop a kind of "radar," or instinct, that keeps them from such accidents.

All I know is that if I ran sewer

crews, every service truck would carry one or more of those guards.

I also suspect that the manhole guard exists because some astute sewer worker had an experience like mine, or actually saw someone fall into a hole, and decided there must be a way to keep that from happening.

Fostering innovation

So when you're cruising the aisles at the Expo or any trade show you attend, be attentive for these often less-than-sensational but extremely worthwhile offerings, and consider how they might help your department.

And better still, try to, in the words of an old railroad company slogan, "give a green light to innovators." Listen closely for your team members' suggestions and even try to draw them out in regular meetings or brainstorming sessions. You never know when a member of your team may come up with an invention that can end up saving money, time or lives across the water and wastewater industry. ♦

Comments on this column or about any article in this publication may be directed to editor@mswmag.com.

Good leaders don't carry the load themselves

To the Editor:

I read your "Lessons in Leadership" column in the February issue of *MSW*. As an Air Force veteran — or any veteran for that matter — I will tell you, officers don't get the job done, noncommissioned officers (NCOs) do. These people are the frontline leaders in any unit, be it a combat team or a maintenance unit.

For all that is said about the military academies and their graduates, they owe it all to those wearing stripes. And oddly enough, most in the officer corps think it is their grand ideas and actions that get

things done. It would never happen, and mistakes are often undone and put right by those with stripes.

Every good officer will credit his/her NCOs for his/her success, and those NCOs will in turn credit the troops who work with them. Too many officers never seem to get around to mentioning the outstanding performance of those who serve under them.

Jim Ward
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A CITY REMASTERED



Guelph takes advantage of government stimulus funding to complete five years of sewer and roadwork in just 12 months

By Peter Kenter

Three years ago, the City of Guelph, Ont., found itself in a unique position. After various levels of government announced funds for an infrastructure stimulus program, the city was offered enough funding to complete five years of combined sewer and roadwork projects for about one-third the regular price.

The catch: all of the work had to be substantially completed inside of 18 months. What followed was an intensive effort to stick to construction schedules, keep traffic moving and citizens informed during the heaviest construction in the city's history. Having an accurate assessment of the sewer and water infrastructure and a well-developed asset management plan helped to keep the projects on track.

The funding offer originally came from Canada's federal government, and the province of Ontario kicked in a matching grant.

"We essentially submitted all of the shovel-ready projects we

had available and were surprised to see that they were all approved," says Don Kudo, P.E., manager of infrastructure planning, design and construction with the city.

The projects were carried out in addition to the routine sewer and water main work already planned that year, since the gov-

"We essentially submitted all of the shovel-ready projects we had available and were surprised to see that they were all approved."

Don Kudo, P.E.

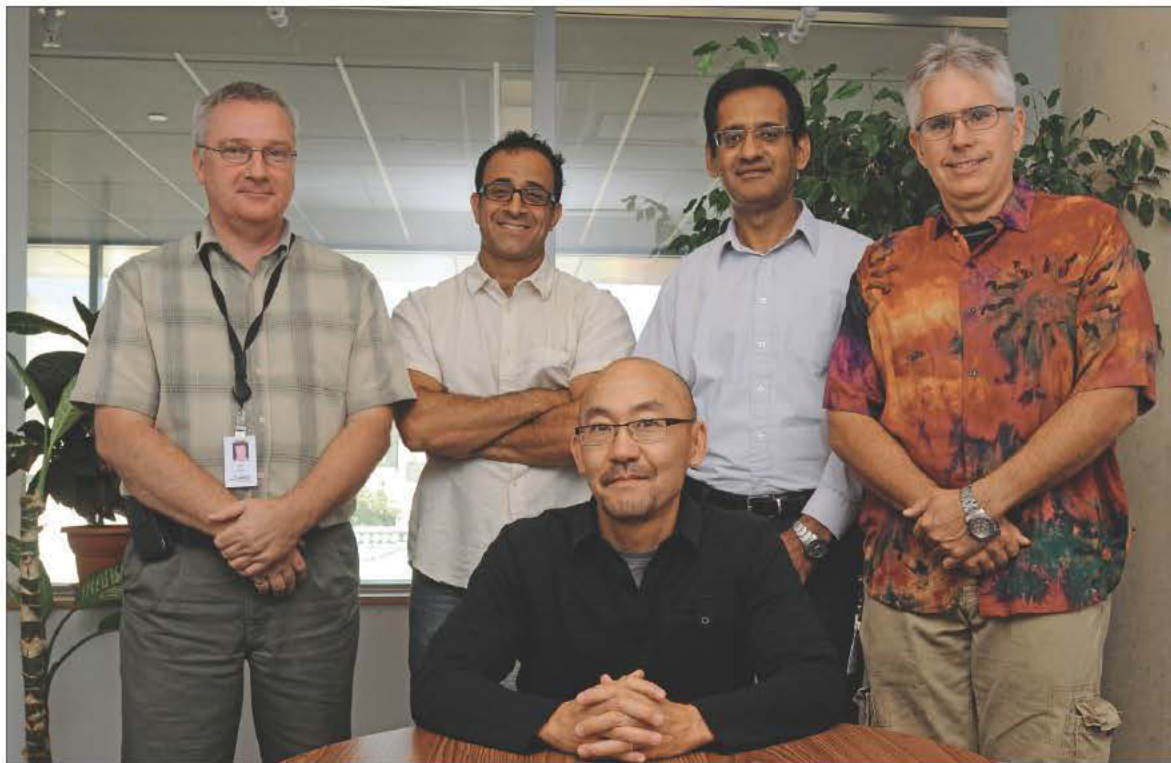
ernment funding only applied to infrastructure projects that had not yet gone forward.

"We put a few previously scheduled projects on hold due to conflicts and workload, knowing we could return to them later," says Kudo. "However, we also moved some projects up when it seemed they would work well with the stimulus projects."

Spurring construction

In June 2009, the governments of Canada and Ontario awarded Guelph a total of \$44.4 million (Canadian) to upgrade sewers,

Isaac Resendes, foreground, and Ryan Nichol of private contractor Drexler Construction work in a trench installing a new sewer line in one of the City of Guelph's older neighborhoods. (Photography by Tony Saxon)



Don Kudo, sitting, the City of Guelph's manager of infrastructure planning, design and construction, is surrounded by his project team of, from left, Brad Hamilton, project engineer; Majde Qaqish, project engineer – water/wastewater; Ike Umar, project manager – design and construction; and Andrew Janes, project engineer supervisor.

water mains, roads, transit infrastructure and municipal buildings. The city contributed an additional \$24 million.

Of the 25 projects approved, 17 involved combined sewer and water main work. The goal was sub-

stantial completion of more than 28,000 feet of water mains, 21,000 feet of sanitary sewers, 19,000 feet of storm sewers, and more than eight miles of roads by an initial deadline of March 31, 2011. To show good faith, the city had to

pay all bills for the projects up front — reimbursement depended on the projects being completed on time.

Guelph typically packages road construction and sewer main work as a single contract. If the project

is primarily sewer or water main work, the contractor engages a sub-contractor to complete the road-work, and vice versa.

"For the past 10 years we've been carefully coordinating road and water infrastructure work to achieve the greatest efficiency," says



PROFILE:

City of Guelph,
Ontario, Engineering
Services Department

INCORPORATED:
1879

POPULATION:
115,000

AREA SERVED:
33.5 square miles

INFRASTRUCTURE:
300 miles of sewers,
310 miles of water mains

ANNUAL BUDGET:
\$8.5 million roads, \$5.9
million water, \$3.7 million
wastewater, \$1.9 million
stormwater (Canadian dollars)

WEBSITE:
www.guelph.ca

EMPATHY, BUT NO APOLOGY

The City of Guelph set aside \$325,000 for the public information campaign, dubbed "Guelph Remastered," to support the many infrastructure projects completed in 2010-11. While much of the conceptual work was done in-house, the city engaged communications agency DDB Canada to deliver much of the program.

"One of the points the agency stressed was that we weren't to apologize for the disruption," says Stacey Hare, the city's senior communications and issues management coordinator. "We could be sympathetic and listen to everyone's complaints and answer their questions. We agreed that it was ugly, and that it was dirty, and that it was inconvenient — but temporary. And we were on their side."

The city also worked with the chamber of commerce and the Downtown Guelph Business Association to develop the campaign. While the campaign used newspapers and flyers to deliver the message, the communications department realized that print alone would not suffice to deliver the detail needed to keep up with the pace of construction.

The city set up a website informing citizens of project progress and any expected delays in traffic and transit systems. The project also had its own Facebook page and Twitter account.

"We also bought time on the radio, delivering traffic reports, and always explaining that we were working toward a deadline, and that

taxpayers were benefiting enormously from the work," says Hare. "We wanted as few surprises as possible."

Once citizens began to get on board, their biggest frustration was traffic delays. The city channeled that anger into a contest in which citizens shared their traffic frustrations to compete for monthly prizes of one of 10 GPS systems over 44 weeks.

"The winner of one contest told us he had visited the website to yell at us, then wound up submitting an entry," says Hare.

The results of the public information effort proved impressive, says Don Kudo, P.E., manager of infrastructure planning, design and construction. More than 90 percent of those polled after the work said they considered it important for the city to undertake the construction projects.

"Overall, we know what level of public complaint to expect on a typical construction project," Kudo says. "It's clear to us that the program helped to inform the public about the project and to minimize complaints and comments."

City representatives presented a report on the campaign at the 2011 annual congress of the American Public Works Association.

RIGHT: A construction worker from private contractor Network Sewer and Watermain Ltd. walks past sections of old sewer pipe along a line that was recently replaced in Guelph, Ontario, Canada. BELOW: A Network Sewer and Watermain Ltd. worker cuts into a piece of concrete sewer pipe.



Richard Henry, general manager/city engineer, planning, engineering and environmental services with the city. "We always look at the condition of the water infrastructure as we move ahead."

Water lines are generally buried about five feet deep. That allows at least one road lane to be left open during replacement or repair. However, sanitary lines run 12 to 15 feet deep, so shoring and barrier requirements mean traffic usually must be rerouted.

"About 80 percent of Guelph's sanitary sewer infrastructure is more than 50 years old," says Kudo. "Before the announcement of the stimulus program, we had completed a two-year program of camera inspection of our storm and sanitary sewers, covering about one-third of the city as part of a plan to complete camera inspection of the entire system. The CCTV inspections, performed by a third-party contractor and consultant, revealed that much of the clay pipe infrastructure was deteriorating. The joints were not great even if the pipes themselves were functional."



"For the past 10 years we've been carefully coordinating road and water infrastructure work to achieve the greatest efficiency. We always look at the condition of the water infrastructure as we move ahead."

Richard Henry

Likewise, about 70 percent of the water mains were more than a half-century old, and about 40 percent of the mains were cast iron.

"In some cases, soil conditions have caused the iron lines to deteriorate, but in other cases it's simply the age of the lines and normal deterioration," says Kudo.

"However, as we install new mains, we're using primarily PVC. We considered some options to do cured-in-place lining, but considering the extent of the excavation for roadwork, it made more sense to use open-cut construction techniques."

Overheated market

City engineers realized that flooding the market with tenders would reduce the competitiveness of some bids. Many contractors were considering work not only in the Guelph area but also in other



Ike Umar, project manager – design and construction with the City of Guelph, looks over blueprints of planned infrastructure work in his office at Guelph City Hall.

nearby cities benefiting from stimulus funds.

"In a normal year, our capital program generally runs in the neighborhood of \$20 million," says Henry. "The contractors and consultants knew as well as everybody else that the stimulus funds were available, but we had already worked the costs of heating up the construction market into our plans. We saw a slight increase in prices overall."

Contractors bid on each separate project, and some won multiple bids. Project values ranged

from about \$1.1 million to \$8.4 million. A typical contract description: "Replace sanitary sewers, water mains, storm sewers, curb and gutter, sidewalk and roadway, traffic signals and add bike lanes." The city engaged the services of seven engineering companies to help frame the tenders and to help manage the work, under the direction of four project managers.

Work on some of the projects began in fall 2009, and all the projects were in full swing by spring 2010, under the banner: "Guelph Remastered — It'll be worth it."



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Citizen involvement

While City of Guelph staff and contractors waged a battle against the clock to complete a slate of challenging sewer and road construction projects in time for a funding deadline, the city's communications specialist organized a public information program to keep citizens informed and involved (see sidebar).

"When we learned that we had received so much money under the infrastructure stimulus programs, we plotted all of the work on a map of the city," says Stacey Hare, senior communications and issues management coordinator with the city. "At that point we realized this was going to be a different year in the life of the city than any we'd experienced in a long time, and that we had to do something to minimize the shock."

The information campaign was necessary because the traffic impacts alone were immense.

"A lot of the projects involved arterial roads, and there was not a single transit route that wasn't affected by construction," says Kudo.

"We kept in close contact with the city's traffic services so they could post detour and alternate direction signs."

Project managers maintained close contact with contractors, holding weekly site meetings to ensure

system (GIS) data to make sure the infrastructure immediately became part of the asset management system.

The city uses GIS-based InfoWater and InfoSWMM software by Innovyze for water and waste-

**"Always have a slate of shovel-ready projects
sitting on the shelf. If funding is offered, you've
got projects that are ready to move ahead."**

Don Kudo, P.E.

that timelines and budgets were met. Despite the immensity of the effort, Kudo notes that the projects were relatively trouble-free.

"We have a strong asset management program in place, and we already knew the condition of our sewers and water mains," says Kudo. "Our water works staff had to make some minor adjustments to valving, but they were very quickly able to analyze the impacts of each project on the entire system, using water flow modeling."

All new construction was tagged with geographic information

water modeling, respectively. GIS software systems are supplied by Esri.

Extension offered

During the term of the project, as the end of the year approached, the federal government announced an extension of the substantial completion date to Oct. 31, 2011.

"We were right on schedule with the sewer, water and roadwork, but the extension was great news for Guelph regarding the transit and railroad bridge projects we were also completing at the same time," says Henry. "This

also gave us a chance to perform some of the work in the warmer spring weather."

Work was completed to the satisfaction of government agencies by the new deadline; only some landscaping, paving and road line marking were left to complete.

Kudo's advice to communities that find themselves in Guelph's position: "Always have a slate of shovel-ready projects sitting on the shelf. In this case, the scope of the work was already defined, and we just needed consultants to come in and provide detailed design. If funding is offered, you've got projects that are ready to move ahead." ♦

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From left, crew members Roy Hudgens and Brooks Jackson, crew leader David Bell, and crew member Marvin Adams prepare a 2-foot liner repair patch (Stephen's Technologies) for installation. (Photography by Matt Walsh)

FOCUS: SEWER

GROWING PAINS

Rigorous planning and new technology help bridge the budget gap for Greenwood Metropolitan District

By Peter Kenter

Growth is generally regarded as a good thing, but few utilities are equipped to take on a nearly instant infrastructure expansion of 900 percent. The Greenwood Metropolitan District (GMD) took the challenge head-on.

Collection system director Wayne Daniel joined the district in Greenwood, S.C., in 1996, as part of a two-man crew responsible for repair and maintenance of 40 miles of sewer trunk line as well as rights-of-way. The equipment roster consisted of a pickup truck and a tractor with a Bush Hog.

The small crew's responsibilities exploded in 2000 with the acquisition of sewer lines from the City of Greenwood and 36 associated political sub-districts, bring-

ing the system length up to 378 miles. Working to elevate the system to uniform standards has been a decade-long effort that consists of rigorous planning to work within tight budgets, and the adoption of new technologies that promote efficiency, including closed-circuit television (CCTV) inspection cameras and a computerized work order system.

"In the late 1990s, we were seeing that we couldn't control some of the flows that were negatively affecting the sewage treatment plant," says Daniel. "The district realized that to effectively address the inflow and infiltration (I&I) issues, the best way was to work with the sub-district commissioners who managed the sewer systems."

The commissioners, however, signed a petition that resulted in

GMD taking ownership of their systems on Jan. 1, 2000. The City of Greenwood simultaneously entered into a maintenance and operations agreement and passed ownership of its system to GMD in March 2004.

The added responsibility led to a dramatic increase in staff — now 15 employees. Fleet requirements expanded to include additional trucks and a new combination sewer truck.

The entire system averaged about 50 years of age, with the oldest sections dating back to 1900. About 80 percent of the lines were made from vitrified clay pipe with the remainder made of ductile iron, PVC and a few miles of concrete.

GIS mapping a priority

Daniel saw inspection, mapping

PROFILE:

Greenwood Metropolitan District, Greenwood, S.C.

ESTABLISHED: 1959

POPULATION SERVED: 50,000

AREA SERVED: 115 square miles

STAFF: 20

INFRASTRUCTURE: 380 miles of sewer mains, 8,500 manholes

ANNUAL BUDGET: \$2.1 million

WEBSITE: www.greenwoodmetro.com





Camera operator David Symmes watches the lining of a sewer from a PowerVision camera (Power Equipment Mfg. Inc.) that is attached to a remote vehicle inside of the sewer system.

“Some (manholes) were sodded over, some were paved over and we even found a couple with houses built on top of them that we could no longer reach. By the end of the initial mapping process, three years later, we were confident that we found 99.9 percent of them, although we’re still finding a few today.”

Wayne Daniel

and geographic information system (GIS) tagging of the expanded system as the GMD’s first priority. In 2001, the department bought its first CCTV inspection van.

“We had a lot of issues with that particular camera model,” recalls Daniel. “I think it spent more hours on the road going out for repair than it did with us, so it took a while to be productive. We also have a large number of 4-inch collection lines, and the crawler camera will do only six inches and above so we had to do a lot of tedious and aggravating work with a push cam. That slowed us down a bit.”

The entire camera procedure took until 2007 with coverage gradually ramping up to 60 miles per year. During that time, the GMD focused its rehab efforts on point repairs, targeting obvious problems, any serious conditions recorded by the sewer cams, blockages, complaint calls and reportable

sanitary sewer overflows (SSOs).

In the meantime, the district fought a preventive maintenance battle against root intrusion using in-house line cleaning equipment and a chemical foaming program administered by Duke’s Root Control, an outside contractor.

“Our video inspections showed us for certain that roots were a major problem,” says Daniel. “Instead of waiting four to five years before we developed a comprehensive plan, we were buying time by becoming more aggressive on root control on the front end, initially treating and clearing about 12 miles of sewer line per year.”

The great manhole hunt

Part of the initial camera work involved accessing sewer lines through manholes. In 2001, the GMD embarked on the task of mapping and GIS-tagging all of the remaining system manholes using Esri software, which mapped survey-grade Global Positioning System coordinates. The CCTV system was often used to help find the next manhole from the last one mapped. All subgrade manholes were restored back to grade. However, what looked like a simple job expanded into an all out manhole-hunt that took several years to complete.

“There were quite a few of them that were covered and bur-



Greenwood Metropolitan District collection system director Wayne Daniel.

WAYNE DANIEL PRESENTED DENNIS PITTMAN COLLECTION SYSTEM AWARD

The Water Environment Association of South Carolina recently honored Wayne Daniel, collection system director for the Greenwood Metropolitan District (GMD), with the Dennis Pittman Collection System Award. The award is presented to an individual who displays excellent achievement in the maintenance of a wastewater collection system. Daniel received the award during the 2011 South Carolina Environmental Conference.

“Wayne has the unique ability to make some of the most mundane jobs a bit more exciting,” says GMD’s general manager George L. Martin. “It’s interesting to listen to him convince a group of co-workers that no matter how tough the job may be, they are lucky because it could be worse. Whether cleaning sewer lines with a hand rod, replacing a manhole in a swamp, or clearing a right-of-way, we are so lucky because we could be ...”

Daniel admits that, although he’s increasingly bound to the office, he loves to experience projects firsthand.

“I’m a visual person and I like to have a personal connection with the projects we work on,” he says. “However, this award belongs just as much to the people who helped educate and advise me when I took on this position, and to the workers who keep the district running. I’m just driving the bus, but I’m not the engine.”



The Greenwood Metropolitan District crew includes, from left, Marvin Adams, David Bell, Vernon Griffin, Bill Wilson, Mathew Overstreet, Brooks Fuller, Eric Gentry, David Symmes, Bryan Weeks, Brooks Jackson, Bo Harter, Chad Chafin, Brent McKellar, Charlie Barr, Robby White and David Ek.

ied over time," says Daniel. "Some were sodded over, some were paved over and we even found a couple with houses built on top of them that we could no longer reach. By the end of the initial mapping process, three years later, we were confident that we found 99.9 percent of them, although we're still finding a few today."

The final tally: more than 8,500 manholes, with about three-quarters of them constructed of brick and mortar. A significant number of them revealed root intrusion, crumbling mortar and heavy I&I, particularly around the seals between the lid and frame interface.

Substantial completion of video inspection of the entire system was achieved in 2010. "We still need to inspect a few lengths of 4-inch line, because the pushrod cameras are limited in range and we don't own a 4-inch camera crawler," says Daniel.

In 2008, GMD contracted with Frazier Engineering of Stanley, N.C., for the installation of 12 permanent flowmeters. "These are situated on the larger trunk lines to

"Every year as we gain experience, we know more of what to look for, and do the homework, including which services need to be reconnected after dye testing, and we're becoming more confident about designing the jobs ourselves."

Wayne Daniel

monitor 10 different basins," says Marion Boone, director of the district's dedicated I&I department. "We monitor the sites daily and download the information monthly so we can interpret the data."

The current maintenance and rehab regimen centers on the findings of the recently completed video work and flow monitoring program, stretching scarce budget dollars to make the greatest difference in the overall system.

Crew dedicated to manhole rehab

A three-person crew is assigned to rehabilitating manholes full-time, four days a week. The crews use QM-1s Restore and Aluminaliner products supplied by Quadex Inc. to reline the manholes.

"After the arduous task of pressure-cleaning the walls, benches and inverts of the manhole to receive the coating, the product is sprayed out of a spinner that we lower down into the manhole," says Daniel. "It sprays about an inch of cementitious material over the bricks. After we raise the spinner, we then go down and trowel it smooth to make it look better cosmetically."

The frame and manhole interface are initially bolstered with cementitious grout followed by Flex-Seal, a flexible sealing compound from Sealing Systems Inc. The seal provides improved water resistance and prevents the concrete seal from cracking, particularly in high-traffic areas subject to vibration and movement.



Crew member Mathew Overstreet repairs the inside of a manhole with Quadex sewer rehabilitation products.

"Last year we completely rehabbed 157 manholes and put our hands on another 604 for other maintenance," says Daniel.

From roots to repair and replace

For sewer lines, the emphasis has switched from root control to



Crew members Vernon Griffin, background, and Marvin Adams use a jetter from US Jetting to clean a residential sewer line.

replacement and repair. Line replacement is handled in-house, although about a third of the lines are buried eight feet or deeper. The GMD equipment fleet includes a mini excavator, but the depth of the lines limits the scope of replacement the crews can handle.

"The mini excavator gets the heck worked out of it, but there are tons of repairs on the books that we can't do, or can't do quickly enough with a small excavator," says Daniel. "We're currently budgeting for a larger excavator that will help us to complete more work faster — all in-house."

In-house crews replaced about 3,000 feet of sewer line in 2011.

The GMD favors cured-in-place epoxy pipelining for line rehab projects. On larger jobs requiring extensive design, the district uses Frazier Engineering.

"However, every year as we gain experience, we know more of what to look for, and do the homework,

including which services need to be reconnected after dye testing, and we're becoming more confident about designing the jobs ourselves," says Daniel.

The actual pipe lining is farmed out to two contractors, Southeast Pipe Survey of Patterson, Ga., and Reynolds Inliner, with headquarters in Orleans, Ind.

"We're not yet ready to bring that work in-house," says Daniel. "We tend to leave cured-in-place pipe (CIPP) projects near the end of the budget year, so that any money we don't use can be funneled into that program. Last year we did about \$170,000 in CIPP work."

The district also uses an epoxy short-lining system from Stephen's Technologies to make trenchless point repairs for projects under 300 feet in length. In-house crews completed 62 short-line repairs in 2011.

Coordinating with pavers

Work is scheduled as much as

possible with road maintenance crews from the city, county and the South Carolina Department of Transportation. Although roadwork is planned well in advance, the actual work is sometimes announced with short notice. Little paving work is completed during the winter season, from December to March.

"The paving folks may call us a week before they want to do work on such-and-such a street, and they need to maintain that schedule full-steam ahead to get around the weather," says Daniel. "It's touch-and-go as to whether we can work within that tight schedule to adjust our manhole frames and often we'll have to work right alongside the pavers as they are laying down asphalt."

Today, the GMD Collection Department employs 20 workers and operates a large fleet of equipment. The equipment garage contains: three Vactor combination sewer trucks; two jetters, one by US Jetting and another by Pipe-Hunter; seven service trucks, all four-wheel drive Ford 350s and 450s; three dump trucks; two backhoes; two tractors with Bush Hogs; and two easement machines.

In-house work is scheduled through an automated computer-based system. After about a dozen years of use, the current software no longer meets the district's

needs, so the GMD is migrating to Cityworks by Azteca Systems Inc.

Incentives for education

Daniel is bullish on employee education. "Every person in the department requires a 'D' level Collection System Operator certificate from the South Carolina Voluntary Certification Committee before completing their first year of employment," he says. "We encourage everyone to reach for 'A' level certification and there are financial incentives attached to each level of advancement."

Improvements in the system are occurring incrementally. Blockage reports were reduced from 172 in 2000 to just 28 in 2011, while reportable SSOs were reduced from 41 to zero during the same period. In 2009, the system's largest treatment plant processed an average flow of 5.7 mgd. In 2011, that was reduced to 5.2 mgd, with reduced I&I credited with some of the difference.

"Improvements are not coming in leaps and bounds and at times it seems that we're spending a lot of money to get a little bit of relief, but we're making inroads and those benefits will start to accumulate over time," says Daniel. "We're getting on top of it." ♦

MORE INFO:

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FULL LOCKDOWN

By Ted J. Rulseh

Thieves will steal almost anything these days, and that includes storm drain grates. Jerry Taylor believes he has a remedy.

Taylor, field supervisor for the Metropolitan Sewer District of Greater Cincinnati (Ohio), has developed an easy-on, easy-off lock to secure stormwater grates as a deterrent to theft.

"It all started last year a couple weeks before Halloween," Taylor

says. "We had a couple go missing here and there, and it wasn't that big of a deal, but then on Halloween day, we had eight of them stolen. The grates just sit in the frames. They weigh maybe 100 to 120 pounds. The thieves just pick them up, put them in the back of a pickup, drive away, and sell them for scrap."

Recognizing the extreme danger posed by an uncovered storm drain, Taylor began calling city



This easy-on, easy-off lock secures stormwater grates as a deterrent to theft.

PHOTOS COURTESY OF MATT-LOCKS USA



The grate lock design is based loosely on a C-clamp (a demonstration video can be viewed at www.mattlocksusa.com). The user positions the device in the storm grate and uses a special wrench to turn a tamper-proof bolt and tighten it down.

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suppliers to see if anyone made a lock for the grates. "I couldn't find anything to lock them down," he recalls. "So I got on the Internet and searched around and couldn't find anyone who made a lock."

Necessity being the mother of invention, Taylor began working on the problem himself.

"I went to a hardware store and bought some C-clamps and started cutting them up and welding them back together," he says. He came up with a basic design, then went to his supervisor and asked if he could develop his invention without violating any city policies. After getting the green light, he engaged a manufacturer to refine the design and make it suitable for mass production.

The design is still based loosely on a C-clamp (a demonstration video can be viewed at www.mattlocksusa.com). The user positions the device in the storm grate and uses a special wrench to turn a tamper-proof bolt and tighten it down.

Taylor knew the lock had to go on and off easily. "We clean our storm basins once every two years,"

he says. "It had to be a lock that you wouldn't have to drill or spend man-hours applying — you'd just walk up, put it on, tighten it down and you're done. When it comes time to clean the basin, you just loosen it up, take it off, do your cleaning, and put it back on."

Taylor sees potential for the locks not just for cities but for private businesses with large parking lots that require drainage. He observes that one local grocery store chain has seen 13 storm grates stolen from its properties in recent months. ♦

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FOCUS: STORM

STORMWATER AS A RESOURCE

Detention basins and native plantings help an Illinois community control flooding, improve water quality and recharge aquifers

Mike Pubentz, director of public works, Montgomery, Ill.
(Photography by John Bonk)

By Lisa Balcerak

In July 1996, a millennial storm hit the Village of Montgomery, Ill., unleashing 17 inches of rain in 24 hours — half the area's average annual rainfall for a year.

The flooded village was devastated, and the experience led local officials to revamp the stormwater management program. The results include higher standards for stormwater detention; the use of native plantings and best management practices; and

PROFILE:
Village of
Montgomery, Ill.



ESTABLISHED:
1858

POPULATION SERVED:
18,000

AREA SERVED:
10.5 square miles

ANNUAL RAINFALL:
34 inches

STAFF:
13 in Public Works

ANNUAL BUDGET:
\$300,000 (stormwater)
includes stormwater
maintenance funds and
basin planting management
funds for 24 basins and
stormwater system

WEBSITE:
www.ci.montgomery.il.us



a new philosophy on valuing stormwater as a community asset.

Montgomery is located 40 miles west of Chicago and has seen more than 300 percent population growth in the last decade, from 5,100 to 18,000. The development boom provided an opportunity for the village to design a progressive stormwater management and biodiversity program that encourages natural landscapes and helps reduce flood losses.

“Local flooding is a traumatic experience. It is heart-wrenching to see the look on someone’s face who just had a home completely flooded. The board wanted to avoid people being in harm’s way in the future.”

Pete Wallers

The program has received awards from the Illinois Association for Floodplain and Stormwater Management (IAFSM), the U.S. EPA, regional conservation group Chicago Wilderness and the Chaddick Institute for Metropolitan Development at DePaul University in Chicago.

Storm cleanup

After the 1996 storm, the Federal Emergency Management Agency (FEMA) declared Montgomery a disaster area. Although it lies at the bottom of a few watersheds and had some flood-prone areas, the village had never encountered such a catastrophe.

As an immediate solution, officials saw that the best way to prevent flooding problems in floodplain areas affected by the storm was to remove as many homes as possible. With federal, state and local funding, the village offered to buy out 50 damaged homes at 95 percent of their market value. Thirty homeowners accepted.

The purchased homes were destroyed, and the land was turned into open park space. To address longer-term impacts throughout the community, the village board committed to higher standards of flood control. The board passed regulations to reduce flooding in newly developed areas, which set



City officials get together to discuss upcoming plans. From left, **Michael Brown**, planner; **Steve Anderson**, village attorney; **Mike Pubentz**, director of public works; **Pete Wallers**, village engineer; and **Anne Marie Gaura**, village manager.

an example for the entire region.

“Local flooding is a traumatic experience,” says Pete Wallers, village engineer from Engineering Enterprises in Sugar Grove, Ill. “It is heart-wrenching to see the look on someone’s face who just had a home completely flooded. The board wanted to avoid people being in harm’s way in the future.”

Montgomery manages stormwater by collecting it and moving it through detention basin systems, then discharging it back to the local drainage system and ultimately to the Fox River.

Guidelines for development

In 2004, to prevent flooding problems in new development areas, officials from Montgomery’s engineering and community development departments contracted Planning Resources, Inc. in Wheaton, Ill., to write Naturalized Stormwater Management Facility Design, Planting and Manage-

BUILDING A BASIN

In 2005, the Village of Montgomery built a new police station, providing the perfect opportunity to develop the first village-owned detention basin following its own guidelines.

Design and planning were completed internally with collaboration from the community development, engineering and public works groups. Last year, the U.S. EPA and Chicago Wilderness awarded the 9.4-acre Montgomery police department detention basin with a Conservation and Native Landscaping Award for promoting plant and wildlife biodiversity while protecting water quality.

“We made the commitment to design our own detention basin to the same standards that we hold the development community,” says Mike Pubentz, public works director. “It was a great learning opportunity for us. Admittedly, we stumbled for a year or so to get the plants to the level we wanted them, but we think it is a very successful basin. We are happy that the EPA and Chicago Wilderness felt it should be recognized as such.”

The Montgomery, Ill., area has integrated natural landscapes to reduce flood loss.

ment Plan Guidelines for developers. Even before the official guidelines had been created, the village started implementing these concepts in 2000.

At the time, there were some county ordinances encouraging best practices for flood control and stormwater management, and Montgomery used them as a stepping-stone to develop the more comprehensive guidelines now in place. Since 2007, the guidelines have been codified into the zoning ordinances for new subdivisions, and they are optional for new nonresidential projects. The guidelines are up-



dated periodically to meet new environmental needs and are posted on the village's website at www.ci.montgomery.il.us.

An important part of the guidelines specifies the inclusion of detention basins that hold back water and maintain a consistent level of discharge over property so that downstream flows remain consistent. In 1996, the release rate required for detention basins in Kane County (where Montgomery is located) was 0.15 cubic feet per second per acre (ft³/s/acre). That rate was based on the amount of water that runs off undeveloped property.

However, county research studies determined that to prevent flood profiles from increasing from the sheer amount of new development in the county, the recommended release rate should be lowered to 0.10 ft³/s/acre. The change posed a challenge for turfgrass, which was commonly used to line the detention basins.

Different vegetation

"A slower release rate meant that after a storm, the detention basins would draw down slower, sometimes exceeding the survivability of conventional turfgrass," Wallers says. "A traditional option

to combat this problem was to construct a ring of rock around the detention basin, but that solution was expensive to install and not very attractive."

Montgomery officials realized that native wetland and prairie plants on the shoreline and prairie plants along the slopes of the detention basins would help with cost and aesthetics. Planning Resources identified native wetland grasses and flowers such as fox sedge, Torrey's rush, rice cutgrass, and Common Water Plantain as hardy plants that would stand up to longer submergence. Maintenance costs are minimal because they don't require frequent mowing.

"We have interest from residents who want to get involved and have a personal connection to the basins. It's a good sign for the program and the future of these types of basins."

Mike Pubentz

The basins also become focal points for some neighborhoods. With the development of such natural habitat, Montgomery is seeing a big increase in wildlife, fish, frogs and birds. An additional benefit to the native plantings is improved water quality.

The plants have root systems that can go down 20 feet, helping take up stormwater before it discharges to the drainage system.

"The main focus for the native plantings is flood control, but it gets into more water-quality issues," says Mike Pubentz, public works director. "Wetland and prairie plants clean the water and filter it before it gets into the system."

Valuing stormwater

Recognizing that stormwater isn't a nuisance to eliminate but a community asset, Montgomery set its guidelines to balance the needs for flood control and water quality. That means addressing release rates, cleaning water before

it goes back into streams, and allowing stormwater infiltration to recharge shallow groundwater aquifers.

"We use an integrated management approach to look at the water supply, stormwater and water quality together," Wallers says. "It's not enough to just control the rate of runoff from a property. That used to be a good local solution to flooding, but that volume transfers to a problem downstream. We need to address it upstream of the watershed. Also, we don't want the resource to leave our area without giving some benefit to recharge the aquifers. An integrated management approach treats stormwater as a resource, not a liability."

As outlined in Montgomery's guidelines, developers must not only follow construction criteria, but also comply with longer-term performance standards for detention basin drawdown times and establishment of native plants. During the typical three- to five-year establishment period for native plants, the basins undergo semi-annual surveys to evaluate whether they are meeting the criteria for plant coverage, weed levels and plant diversity. Developers are required to monitor and maintain the plants.



Workers from Pizzo & Associates plant plugs of various prairie species in holes they pre-drilled with a handheld auger at the outermost edge of the naturalized area.



Administrative assistant Peggy Rhodes, left, and village planner Jerad Chipman check one of the rain barrels set up in Montgomery to catch stormwater runoff.

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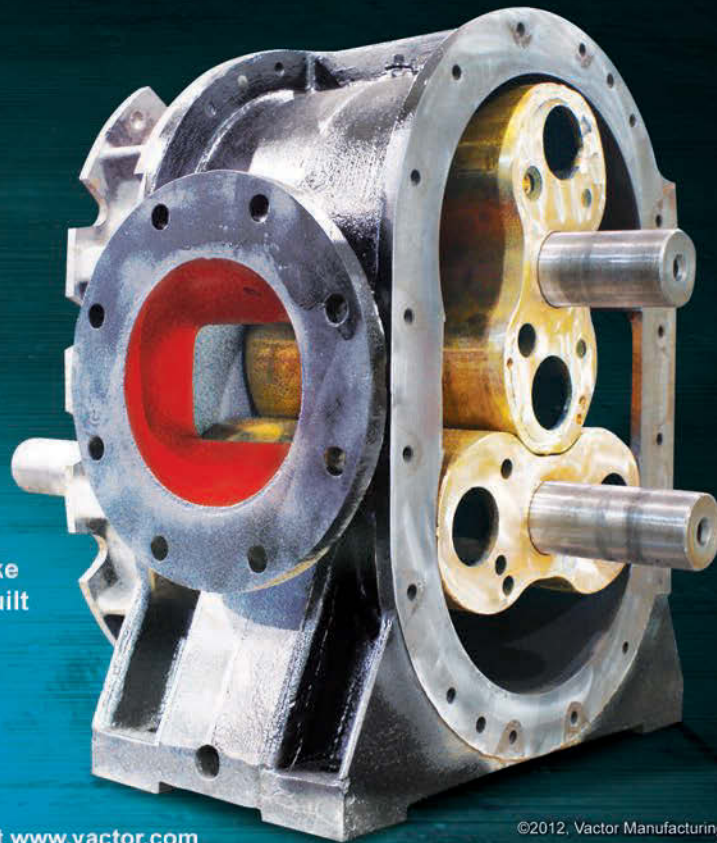
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care are minimal. When weeds are controlled properly early in basin development, the established native plants can out-compete them. The village mows basins once a year to remove old plant material and uses a controlled burn about every two years.

By using native plants instead of turfgrass, village staff estimates annual basin maintenance savings per acre from \$500 during years when controlled burns are performed, up to approximately \$2,500 in non-burn seasons. These figures are based on comparing one acre of naturalized basin plantings maintenance against an acre of turfgrass that is mowed, aerated, treated for weeds and insects, and repaired as necessary. Annual savings are similar for larger basins but are generally realized earlier in the life of the basin, often as soon as two to three years after development.

Wildflower or weed?

When homes in a new subdivision are being built and sold, the native plants are usually still being

"We want the public to take a different look at stormwater management from the traditional hole in the ground with grass around it. Some people may never like this type of design. Some people love it and want to do it everywhere. There's a group in the middle who may not understand it, so we try to educate them and have them see the benefits."

Pete Wallers

established, appearing coarse, weedy and unkempt to an untrained eye. This can cause confusion and anger from residents. To gain public acceptance of native plants, Montgomery educates residents about the benefits of the naturalized basins.

"We want the public to take a different look at stormwater management from the traditional hole in the ground with grass around it," Wallers says. "Some people may never like this type of design. Some people love it and want to do it everywhere. There's a group in the middle who may not understand it, so we try to educate them and have them see the benefits."

Montgomery shares informa-

tion through its website, newsletters and public basin education sessions that target homeowner associations and other local groups.

"We tell people what they can expect to see and how it is beneficial so they have a better understanding of what is outside their back door," says Michael Brown, senior planner in Montgomery's Community Development Department.

One sign that public education is working is growing interest in a basin stewardship program in which residents living near the basins can take part in their upkeep. This involves educating volunteers on weed control, plant monitoring and plant identification.

"We have interest from residents who want to get involved and have a personal connection to the basins," Pubentz says. "It's a good sign for the program and the future of these types of basins."

More best practices

Looking ahead to future stormwater management challenges, the village expects to use more best management practices that reduce pollutants before they get into the stormwater system, such as permeable pavers, plant-lined bioswales, rain gardens and reduced road salt usage. For now, Montgomery officials are confident they have implemented good policies and ordinances to keep people safe from flooding.

"Our combined commitment to naturalized basins, proper floodplain elevation requirements and proper release rates help us minimize flood damage," Wallers says. "Over the last decade, we haven't had any drainage complaints in any of the new development areas. That alone tells us that the system is working pretty well." ♦



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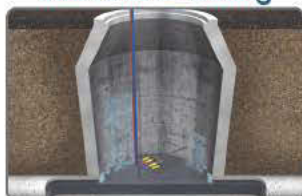


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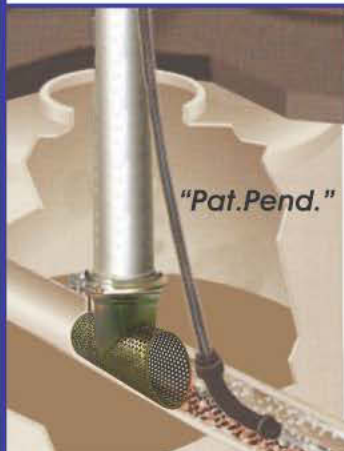
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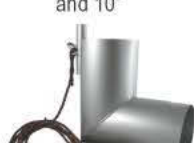
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SMART TOOLBOX

Level 5 ATC Tool Control System from Snap-on uses technology to secure tools and track their usage

By Erik Gunn

Toolboxes might seem to be the simplest of devices in any shop, but a new toolbox system from Snap-on Industrial helps teams of workers keep track of shared tools, identify which ones are due for calibration, and even log when tools are out of service for repairs.

The Level 5 ATC Tool Control System is part of a larger family of products from Snap-on aimed at helping tool users organize, secure and manage their tools and other supplies as assets. The Level 5 ATC consists of a toolbox equipped with a digital scanning system that automatically makes a visual record of the removal and return of tools, along with proprietary software that keeps track of that information.

The system was developed for military, aerospace and utility industry settings, where inadvertently



Access to the toolbox is granted via an employee badge that is read by an electronic reader at the front of the box. A touch screen controls the toolbox system.

leaving a tool behind, such as in an aircraft jet engine or in a power-generation turbine, can result in damage and pose a safety hazard. But Snap-on officials believe the system has broad applicability to larger workgroups who may share tools and require their effective management as important assets to the operation. The company is looking to interest municipal public works operations in the benefits of the system, officials say.

Patrick McDevitt, manager of business development for Snap-on, demonstrated the Level 5 ATC on Jan. 19, 2012, at Snap-on's world headquarters in Kenosha, Wis.

Walk-around

On the outside, the Level 5 ATC is a steel toolbox that stands about chest high when mounted on heavy-duty casters. It's available in two sizes, one 36 inches wide with a capacity of 450 tools, the other 54 inches wide with a capacity of 750 tools.

Heavy-duty drawers that slide out smoothly are equipped with foam inserts cut to snugly fit the tools stored within. Alternative drawer configurations are available.

An interlocking system prevents more than one drawer from being opened at a time, preventing tip-overs. The top is stainless steel and meets standards as a work surface, while the sides, front



A user opens a drawer of the Snap-on Level 5 ATC Tool Control System. (Photography by Erik Gunn)

and back are available in a choice of colors.

In that respect, the unit resembles conventional Snap-on tool chests. The unit's security features and asset-tracking features, however, set it apart.

On the top surface is a small touchscreen used to control the system. At the front edge of the steel top is an HID Scanner electronic card reader that unlocks the unit when an approved employee swipes an ID badge over the reader. The touchscreen also records data as it is input by the user who is retrieving or returning tools.

The heart of the system, however, is not normally visible. Inside the unit, level with the top drawer and located at the rear, are four electronic digital cameras arranged in parallel that point straight forward and constitute the scanning system.

At the front of the unit, mounted in the underside of the stainless steel top, is an angled mirror that runs from one side of the tool chest to the other. A lighting system illuminates the contents of

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LOCATION OF DEMO:
Snap-on headquarters, Kenosha, Wis.

DEMONSTRATED BY:
Patrick McDevitt, Snap-on manager of business development

LIST PRICE AS DEMONSTRATED:
Not including the tools, \$20,000 for the 36-inch model, \$23,000 for the 54-inch model

each drawer that is opened. In a setup that resembles the optics of a periscope, the contents of the drawer are reflected in the angled mirror. The mirror's angle, in turn, allows the contents of the drawer below it to be seen by the camera system behind it.



Views of the interface for the database on the computer.



The database includes images of individual tools and tool parts for easy identification.



If a tool is broken or otherwise needs servicing, such as calibration, the user can log that information via the touch screen. The system maintains a record of all information entered, as well as the user who entered it.

Inside each drawer, running from front to back along either side, there is a pattern of white dots that the software uses to identify which drawer is open and to pinpoint the X-Y coordinates of each tool.

When first set up, an image of each drawer is created with the scanner and filed in a database. Then, as drawers are opened and tools are removed or replaced, the software compares the current state of the toolbox against the baseline images.

"It knows who enters it and it knows what you took," said McDevitt.

The system can transmit data via either wireless or a cable Ethernet connection to a computer equipped with companion administration software for the system.

Operation

McDevitt began the demonstration by swiping a sample employee badge against the card reader. He pointed out that access can be either granted or restricted to par-

ticular cardholders, so that the unit first had to match the cardholder against its database of authorized users of the toolbox.

There was a short electronic beep, and a computerized voice emitted from a tiny speaker in the control unit requested McDevitt to "Select work location."

The control unit can be programmed with a customized menu listing the specific usual work locations relevant to the toolbox owner, such as by department or perhaps cost center. Logging the

from which it was taken (each of the three came from drawer no. 1).

To the right of the data was an ID-badge-style photo image of the user. In this instance, it was a fictional user created for the purposes of demonstrating the unit; normally, it would be the photo of the authorized user accessing the toolbox.

Five button icons across the bottom of the control screen allow access to various information screens: "Tools Out," "Tool Search," and "Setup" to the left, and "Power Off" and "Log Out" to the right.

"I could find the part number, hit it and say, 'Ha! Tom took it.' Then I could go track down Tom."

Patrick McDevitt

intended work location is an optional feature, McDevitt noted, and the purchaser can choose to have it programmed to simply record who is gaining access to the box without identifying a specific work location or application.

McDevitt picked a work department from a short list on the control unit touchscreen. "Access granted," the electronic voice announced.

McDevitt opened the top drawer of the toolbox, picked out a ratchet handle and two socket heads, put them on top of the toolbox and closed the drawer. "Issue three," the electronic voice said — meaning that three items stored in the toolbox had been removed.

The control screen displayed three lines of text, each one showing a part number, the name of the tool removed, and the drawer

He shut the drawer again and touched the "Log Out" button on the control screen. "Log out," the electronic voice said.

With the tools out of the toolbox, the screen continued to display the list of missing items with each tool's name, part number,

and the drawer to which it is assigned. To the right of the screen, the ID-badge photo of the user was replaced by a padlock icon. A small outline image of the toolbox on the screen was clear, except for the top drawer, which was colored yellow.

McDevitt explained that the colored drawer image was an immediate signal that tools were out of the drawer. "If it were red or candy-cane, it would say there's an issue in that drawer — maybe a wrong tool, et cetera," he said.

With the unit once again locked, he used the badge to unlock it. "Select work location," the voice prompted. McDevitt made a selection and again the unit announced, "Access granted."

Now McDevitt returned the tools he had removed, putting two in their original storage spots, but deliberately putting the third — a socket — in the wrong spot. He also removed three other tools before shutting the drawer.

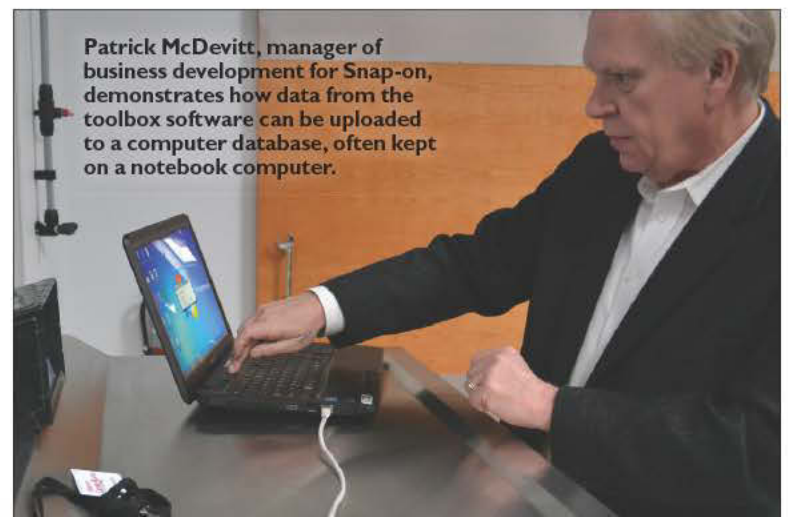
"Incorrect tool in drawer one," the electronic voice said.

It continued: "Return three. Issue three" — in other words, three tools had been returned and three more removed.

The control screen displayed a digital photo, taken by the scanning system, of the drawer as it was supposed to look when stocked properly.

"This is cuing them to go look there and go fix it," he said, referring to the deliberately misplaced tool.

The images are also transmitted to the external computer data-



Patrick McDevitt, manager of business development for Snap-on, demonstrates how data from the toolbox software can be uploaded to a computer database, often kept on a notebook computer.

base as part of an audit trail that the machine keeps to enable review of the use of the toolbox and its contents. The audit trail images are time-dated so that if any questionable actions occurred with the unit they would be traceable to the person responsible.

"For example, I could catch a guy who broke a tool and returned it," McDevitt said. "I can go back through the picture audit trail and see it in good condition and then see it returned as bad."

McDevitt then removed a total of five tools from three different drawers. The display screen listed them all, showing which drawer each one had been removed from. He explained that a toolbox user who wanted to know who was using a particular "checked-out" tool could



A strip containing an arrangement of dots runs alongside either side of each tool drawer. The dots provide coordinates for the drawer, so that the software can establish exactly where in the drawer an object is located.



Having removed tools, Patrick McDevitt logs out of the toolbox using the touch screen control.

learn that by simply touching the icon of the tool on the screen.

"I could find the part number, hit it" — the line on the screen corresponding to the tool — "and say, 'Ha! Tom took it.' Then I could go track down Tom."

McDevitt then pulled out a ratchet from the drawer. "We'll

pretend this is broken," he said.

On the touchscreen, he selected the data line for the tool. A new screen appeared with a series of button icons relating to the status of the tool. The buttons were in different colors labeled "Not Received," "Broken," "Lost," "Out for Calibration," "Calibration Requested," and "Repair Requested." He touched the orange "Broken" button. The database was updated to show the tool as broken, and when the screen returned to the list of tools that were out, the line corresponding to the "broken" tool was colored orange.

Alternatively, he explained, for a tool in need of calibration, the "Calibration Requested" button could be pushed.

In addition, for industries where tool calibration is critical, the system can be programmed with the calibration dates for each tool. When the date approaches, it can signal to the user the looming deadline.

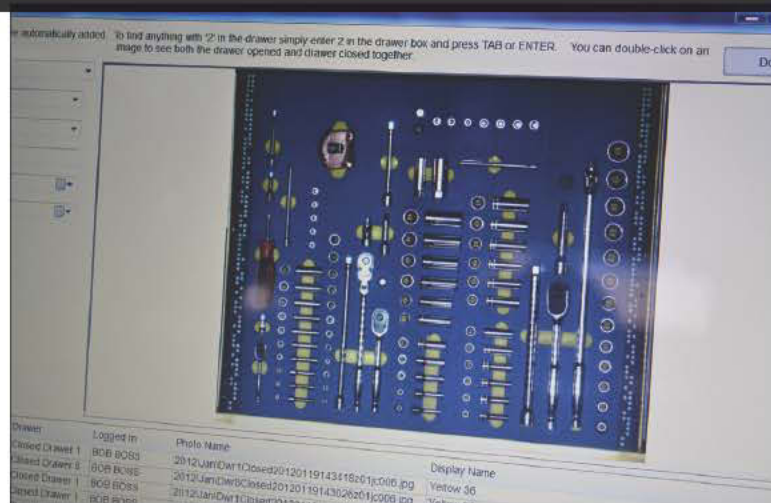
McDevitt returned the tool that had been labeled "Broken" to its drawer. The computer voice responded: "Attention! Return one." McDevitt explained that because he had not cleared the tool as "repaired," the unit was calling his attention to the fact that a broken tool had been put back in the system. Now he retrieved the tool, touched the data line to bring up the tool status buttons, and touched "Normal." He then returned the tool to the drawer.

McDevitt then moved to a laptop computer with the system's administrative software installed. That database is capable of showing the status of the contents of not just the one toolbox but a whole collection of them in a single organization.

The database is searchable by a number of parameters, and synchronizes with the data in the toolbox control unit. It also can be used to track inspection schedules, deadlines and a range of other functions.

Observer's comments

The system appears swift and



The database includes photographs of the contents of each toolbox. The photos are made automatically by the cameras that are the heart of the ATC Level 5 system. These are part of the audit trail the system keeps.

accurate to use, and despite the sophisticated information system behind it, retrieving and returning tools does not appear to take any more time or be any more cumbersome than using a conventional toolbox.

Although municipal public works operations may not have some of the same requirements as the industries for which the system was initially created, teams with larger staffs and expensive equipment that requires certification may find it useful as a way of ensuring that a number of expensive assets are kept secure.

Manufacturer's comments

The greatest use for the system is for expensive tools that require certified users and periodic certification and calibration, said McDevitt. It also reduces the need for tool crib attendants in operations that involve a lot of shared use of tools, or in situations like overnight shifts when it might not be cost-effective to hire a tool crib attendant for an entire tool collection.

McDevitt said the system is customarily sold along with an entire tool collection, although it is possible for buyers to obtain one for their existing tool sets. The foam inserts can be customized to most tool systems the buyers have, so long as they provide Snap-on with comprehensive information about their size and shape. The

company has an extensive library of tool silhouettes it uses to further help in customizing the toolbox. Additionally, the names and part numbers of each tool to be stored in the unit must be entered into the database; that is done using the administrative software package.

While the demonstration model was configured with a "setup" button on the main screen, most standard users wouldn't have that button, McDevitt said. The button is used to create the initial image database for the toolbox contents. "We call it training the drawer," he said. "All you have to do to train this drawer is put the tools in it."

In the process of setting up the drawer — typically done by Snap-on personnel for the customer's desired set of tools — images are made of tools in various positions in their designated spot, so that the system can tell a tool has been returned even if it hasn't been put back in precisely the same way, he said.

Snap-on provides on-site training to all customers upon delivery of the system.

As currently designed, the unit requires an electrical outlet and thus can't be easily moved around without unplugging and replugging it. A portable, battery-powered version is expected to be released soon, McDevitt said. ♦

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A manhole in Waupaca, Wis., after structural rehabilitation with the Monoform system. (Photos courtesy of Infratech Infrastructure Technologies)

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FORMED IN PLACE

A manhole rehabilitation system uses special forms to create structural, monolithic, watertight liners that stand up to wear

By *Scottie Dayton*

“I was extremely happy with their work. It turned out so well that the structure looks like one cast by a manhole company.”

Roger Hansen

Installed in the 1920s, the brick and block manholes in Waupaca, Wis., were failing from age. Some were in danger of collapsing. Most had no flow lines, enabling solids to accumulate and create headloss that reduced hydraulic capacity.

The city consulted senior engineer Taryn Nall of Kaempfer & Associates engineering firm. Nall recommended Infratech Infrastructure Technologies (Infratech) to rehabilitate the manholes using the Monoform system to create structural, monolithic, watertight concrete liners.

Street superintendent Roger Hansen asked Infratech regional manager Matt Huston to demon-

strate the technology on a problem manhole.

“Sewage built up on the trench of this manhole so quickly that my crew had to clean it monthly,” says Hansen.

For the demonstration, the public works department provided a new casting and lid from Neenah Foundry. Two Infratech technicians installed the concrete liner and constructed a bench one inch above the crown of the pipe.

“I was extremely happy with their work,” says Hansen. “It turned out so well that the structure looks like one cast by a manhole company.”

The crew now cleans it annually as part of the sewer mainte-



Infratech project manager Ed Brown measures the diameter of a manhole to select the proper-size forms.

nance program, and the department budgets \$30,000 per year for manhole rehabilitation. In 2011, it



The custom-made Monoform sections are fastened with C-clamps.



A bench with flow channel is constructed one inch above the crown of the pipe.



Ed Brown installs the new manhole frame and lid.

rehabilitated 10 structures with the Monoform system.

Manholes of the year

Many manholes remain to be located on GIS as the department transitions from paper to digital files. The cleaning crew helps identify the worst manholes. Hansen believes the city has rehabilitated all manholes without flow lines.

Lining manholes is a custom job. Workers first measure the diameter at the bottom of the structure, the height of the chimney, and the depth, enabling the Monoform crew to select the appropriate size wall, reducer, and chimney forms. Most of the manholes are 48 inches at the bottom and taper to 28 inches at the top. Depths vary from 4 to 25 feet.

"The chimney must be knocked off to make room for the concrete

forms," says Hansen. "The taller the chimney, the higher the demolition cost."

Going around or abandoning in and out pipes also affects price.

Before the Infratech team arrived, the city cleaned the manholes to be rehabilitated using a 2003 Vactor 2115-J6 combination sewer cleaner with a 15-cubic-yard debris body, four 625-gallon fresh-water tanks, two-stage fan with fluid coupler pulling 450 gpm, and dual-action water pump delivering 80 gpm/2,500 psi.

Infratech project manager Ed Brown and technician Jim Peltier parked their fifth-wheel truck and job trailer in the center of the street next to the manhole, leaving enough space for traffic to pass on either side, and marked the work area with traffic cones.

"Except for one instance when we resurfaced a street, we have never closed a thoroughfare for them to work," says Hansen. "We have always kept live traffic on it."

Smooth process

The Infratech team rehabilitated three or four manholes every two days. For snowplowing purposes, they sawed a square cut through the asphalt, but with the corners pointed toward the curbs and traffic flow. The Infratech personnel checked for gases before entering manholes and followed OSHA confined-space entry standards.

Using a Vanair Viper air compressor driving the jackhammer, Peltier removed the asphalt and soil from around the manhole. Before demolishing the chimney, Brown covered the bottom of the hole with a tarp and a special parachute attached to lift lines to catch falling debris.

"They remove as much chimney as necessary to achieve a uniform diameter with a 4-inch space between the form and manhole wall," says Hansen. "That eliminates thin spots in the concrete liner, especially important at frost depth."

Brown and Peltier cut a 36-inch Sonotube concrete form from Sonoco Construction to the proper

depth, then grouted it to the manhole's rim. After removing the tarp and parachute, Brown scrubbed the lower areas of the hole to remove remaining dirt or bits of brick and mortar.

Inside job

To build the manhole liner, Peltier handed down the custom-made sections to Brown, who fastened them with C-clamps to form a 40-inch ring, then mudded it in place. The rings tapered to 26 inches as the column rose.

"They form manholes the first and second day, then pour concrete in the afternoon," says Hansen. "At first, I wasn't positive that I liked the idea of pouring concrete surface patch with the asphalt. I'm okay with it now, as we haven't seen any settling or joint problems."

A pouring cap on top of the chimney form kept 7-bag 4,500 psi concrete mix from entering the

manhole. With the pour completed, Brown entered the manhole and tapped the wall to settle the concrete into any voids. A sheet of plywood covered the hole while the concrete cured. After it had hardened, the crew removed the forms, applied urethane sealants at the pipe connections, and placed the new casting and lid.

Hansen appreciates that the work is flexible.

"If we find a critical manhole not in this year's allotment, I ask Ed and Jim to take the measurements," he says. "Matt faxes a quote and allows us to change which manholes we want done."

Hansen estimates that excavating and replacing the manholes would cost \$8,000 to \$10,000 each.

"The Monoform system averages \$3,000 per manhole, saving us \$5,000 to \$7,000 a unit. That's a substantial amount of money for any city." ♦

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2012 EXPO

ON DISPLAY

Pumper & Cleaner Environmental Expo exhibitors use the big stage in Indianapolis to unveil the latest industry products and innovations

By Luke Laggis and Mike Schoblaska

A giant showroom of cutting-edge municipal and environmental services equipment and products greeted attendees at the 2012 Pumper & Cleaner Environmental Expo at the Indiana Convention Center Feb. 27-March 1.

The Expo, held for the first time in Indianapolis, offered 501 exhibits and attracted 8,595 attendees representing 3,875 companies in a wide range

of water, wastewater, environmental service and gas and oil service industries.

Attendees kicked the tires on heavy-duty vacuum and hydroexcavation trucks, tested a wide range of software, and learned about tools and accessories as varied as trailer-mounted waterjetters, smoke blowers and mobile dewatering equipment. Here's a sampling of the new products seen at the Expo for the first time.



New hydroexcavator

The **Mud Dog 1600** hydroexcavator from **Super Products** delivers up to 18 gpm at 3,000 psi. An 8-inch, positive displacement vacuum system provides 5,800 cfm airflow and 28 Hg of vacuum. 800/837-9711; www.muddogeasy.com.



Smoke blower eliminates residue

The **Air Loc Plumbing WV Smoke Blower** from **Cherne Industries** detects odor sources in a building's pipes. It uses liquid smoke that is atomized before heating, eliminating liquid residue. 800/843-7584; www.cherneind.com.



Quickset epoxy lining system

The newly patented **epoxy lining system** from **ACE Dura-Flo Systems** can remedy pinhole leaks, lead/copper contaminants, discolored water and low water flow with a 2-hour return-to-service time. 949/724-0323; www.aceduraflo.com.



Lift station valve

The **Termex** valve from **Mainline Backflow Products** is a PVC valve with an O-ring seal, lightweight ABS gate and two-hinge system. They are available in various sizes and normally open or normally closed designs. 877/734-8691; www.backwatervalve.com.



Improved vacuum containers

Vacuum containers from **Wastequip** are available in 20- and 25-cubic-yard capacities and are tested to 27.5 Hg of vacuum. Features include a 1/4-inch steel plate body, one-piece floor and roof, simplified ratchet and chain sealing mechanism, and a one-piece t-seal gasket. Options include placard holders, additional valves and drains, and side hinge pull bar design. 877/468-9278; www.wastequip.com.



Symmetrical plunger pump

The new **MW Series** of high-pressure triplex plunger pumps from **General Pump** feature the capability to run dry for up to 30 minutes without causing any damage to the wet-end components. The pump is designed to be symmetrical from top to bottom so it can be converted in the field for use in either a right- or left-hand crankshaft configuration. Simply remove the manifold and crankcase cover and flip the pump. Engineered for 80 gpm, 2,000 psi machines, it works with the most popular spec for sewer jetting equipment. The pump has a maximum inlet pressure of 45 psi, maximum fluid temperature of 140 degrees F and weighs 540 pounds. 888/474-5487; www.generalpump.com.



Versatile waterblaster

The **Torus XL** waterblast tool from **StoneAge** features replaceable manifolds for different operating conditions, adjustable speed control, replaceable 1-inch O.D. extensions, OC8 carbide nozzles, stainless steel construction and can be hung from either end. It has a maximum pressure of 15,000 psi and maximum flow of 200 gpm, weighs 98 pounds and has an entry diameter of 8 inches. 866/795-1586; www.stoneagetools.com.



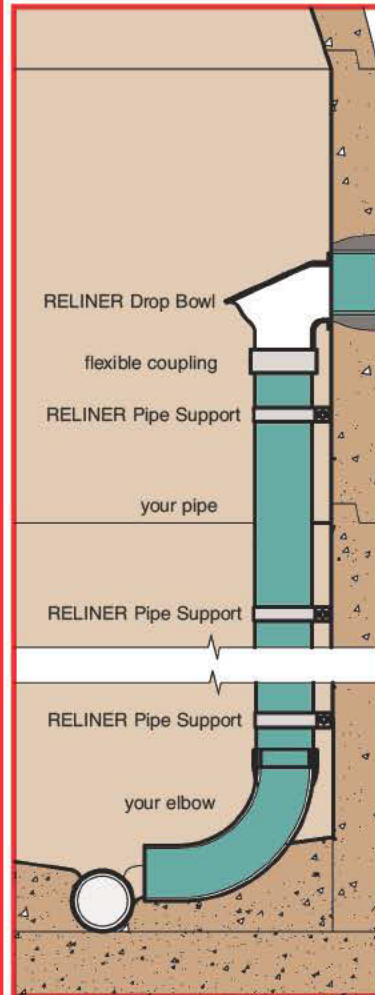
Compact mainline televising system

The **Predator Advantage** portable mainline system from **UEMSI** features a new compact reel for a televising unit that can be transferred from truck to truck and access backyards and narrow easements. The unit, designed for televising 6- to 60-inch sewers, comes standard with 500 feet of cable, or can be ordered with 600-foot or 1,000-foot options. The heavy-duty unit is accompanied by the Prowler and optional Trax Jr. wheeled tractors and Explorer Zoom pan and tilt camera. Other standard features include a 10.4-inch color LCD monitor, built-in DVR with 160 gb hard drive, USB port, built-in SD card holder and wired handheld remote control. 800/666-0766; www.uemsi.com.

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Flexible drain flusher

The **DrainJet-Pro** hydraulic drain flusher from **Petersen Products Co.** is available in sizes from 1 1/2 inches up to 6 inches and can be used on jetters with pressures up to 1,000 psi. It can be used to clean and flush clogged and slow lines and also to prevent backflow. Constructed from heavy-duty ballistic nylon, the unit is flexible enough to maneuver around bends in pipes. **800/926-1926; www.pipeplug.com.**



Increased cleaning pressure

The **Vactor 2100 Plus** catch basin cleaner from **Vactor Manufacturing** has a fan and air-routing system that delivers increased vacuum pressure in single-stage and dual-stage fan configurations. Ergonomic controls make it easy to operate and maintain. Additional features include a 1,250-gallon water capacity, 12-cubic-yard debris capacity, 20 gpm at 2,500 psi hydroexcavation kit and an 8-foot telescoping boom. **800/627-3171; www.vactor.com.**



Complete mortar application system

The **Pro50 Starter** mortar spray system from **Parson Environmental Products** is a complete mortar application system that includes mixer, pump and spray gun. An onboard computer balances the spray rate with the pumping volume to prevent clogging. The hopper has a 12.5-gallon capacity with a flow rate of 2 to 3.5 gallons per minute. The system includes 50 feet each of 1-inch material hose and 1/2-inch air hose. **610/582-6060; www.parsonenvironmental.com.**



Remote-controlled manhole cover lifter

The **Magnetic Lifter** from **Rock Mills Enterprises** safely and efficiently removes and replaces heavy manhole covers with the push of a button. It is powered by a 12-volt system and mounts to the front or rear of a vehicle with standard 2-inch hitch receiver. The electromagnet delivers 5,000 pounds of lifting force and 7,000 pounds of down pressure. The wireless remote control, weather-proof camera and monitor system enable the system to be remotely operated from the cab. **712/451-6550; www.rockmillsent.com.**



Remote vacuum truck monitoring

Offered by **Vac-Con**, the **OmniView** data logging and telematics system keeps track of current and past vacuum truck locations using GPS tracking. It also tracks numerous truck functions, including fuel usage on the main and auxiliary engines, vacuum and pump run times, hose footage, water quantity on-board, system pressures, vehicle rpm, and vehicle and auxiliary engine hours (for maintenance interval tracking). A total of 70 functions are monitored. **904/284-4200; www.vac-con.com.**



Continuous hemispherical scanning camera

The **Digital Universal Camera (DUC)** from **CUES** is a high-resolution digital CCTV side scanning camera designed for rapid and detailed condition assessment of wastewater systems. The system produces a continuous hemispherical scan of the internal conditions in 8- to 60-inch pipe. It operates at a constant speed without the need to stop or pan and tilt. It can inspect and assess 5,000 feet per day when used in conjunction with the asset-based Granite XP decision support software. **800/327-7791; www.cuesinc.com.**



Multi-mode vacuum trucks

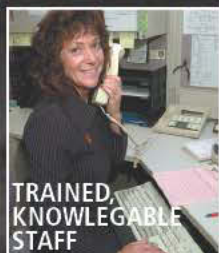
Jack Doheny Companies are now distributing the **OmniVac** series of vacuum trucks from **Wastequip's Cusco Division**, featuring five operating modes: 1,400 cfm wet mode operating in both vacuum and pressure modes, 1,400 cfm dry mode operating in vacuum mode and 360 cfm industrial mode operating in both vacuum and pressure for smaller jobs or for jobs where hydrocarbons are present. It also offers the additional filtration of a complete baghouse and air cannon pulsation cleaning system. **888/936-4369; www.dohenysupplies.com**



Reliable pumping without clogging

Godwin Dri-Prime NC Series pumps from **Xylem** are designed for energy efficiency and non-clogging operation even when moving liquids containing stringy solids, fabric and plastics including bubble wrap. Applications include sewer bypassing, pump station backup, sludge pumping, stormwater pumping and industrial effluent. An automatic self-priming venturi priming system primes and re-primers from dry up to 28 feet with no operator assistance or foot valve required. **914/323-5700; www.godwinpumps.com.**

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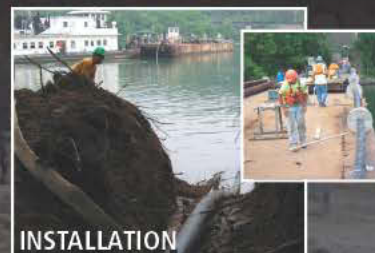
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Double-duty inspection system

The **MainLite** portable pipeline inspection system from **Rapid-View IBAK North America** has 1,200 feet of fiber optic cable and is compatible with all of the company's cameras and inspection equipment. It can also be truck-mounted for stationary use. Controls include a touchscreen and dual joysticks, one for the camera and one for the tractor. 800/656-4225; www.rapidview.com.



Portable pipeline vise

The portable **460-12 TRI-STAND** chain vise from **RIDGID** can hold pipe up to 12 inches in diameter and features an adjustable rear leg that provides the ability to level the stand. Other features include an integrated ground lug that provides a conductive surface to connect the weld ground, a leg chain that keeps the legs folded when not in use, and a tool tray. 800/769-7743; www.ridgid.com.



Updated command module

The **P350 flexitrac** system command module from **Pearpoint** features an 8-inch industrial grade TFT screen with anti-reflective protection, splash-proof keyboard for text entry and report writing, and Bluetooth wireless technology to send photos. The USB 2.0 port allows transfer of files to a PC or laptop, and the unit is also compatible with the P340 flexiprobe pushrod system. 800/688-8094; www.radiodetection.com.



Real-time pressure testing results

The **pressure testing system software** from **Pipeline Observation System Management (POSM)** is used for pressure testing joints, laterals, grout repairs, quick line repairs and entire lateral sections. The software allows the user to control the bladder pressure involved, add observations, start and stop the test, and view the real-time results of the test. 859/274-0041; www.posm.us.



Pumps for varied liquids

Priming-assisted **Prime Aire Plus** pumps from **Gorman-Rupp Co.** offer venturi/compressor priming systems along with increased head and flow and enhanced maintenance features. Models in sizes up to 8 inches are suitable for clear liquids and liquids that contain large solids. Features include externally adjustable running clearances, ductile iron body and impeller, oil-lubricated bearings, and a fuel-level monitoring system. 419/755-1011; www.gormanrupp.com.



Versatile vacuum truck

The **Aquatech F-10** combination jet/vac truck from **Hi-Vac** is designed for easy operation and efficiency in a host of municipal and industrial applications. It includes the same proven components as B-Series units and features a front-mounted reel, positive displacement blowers, a self-cleaning, top-loading boom that extends 26 feet from tank inlet, and single-engine drive that decreases fuel consumption and saves on maintenance expenses. 800/752-2400; www.aquatechinc.com.



Complete rehabilitation in a kit

The **Perma-Patch** kit from **Perma-Liner Industries** is designed for 3- to 24-inch diameter pipes with cracks, holes and separation in joints. The system uses a fiberglass mat with sodium silicate resins creating a structural repair with a minimum life span of 50 years. The kit includes two-part epoxy in a ready-to-mix bag, bladder protection sleeve, fiberglass mat, trowel, ground protection, hand protection gloves, zip ties and complete instructions. 866/336-2568; www.perma-liner.com.



Self-sufficient bundle cleaning

The **ATL-5000** from **NLB Corp.** is a self-sufficient high-pressure I.D. tube cleaning system that requires no external power or air supply. The system includes a three-cylinder diesel engine rated for 31 hp and can operate at pressures up to 20,000 psi. Fully adjustable lance stroke length allows configuration for various length bundles, and the optional HVAC package provides heat and cooling to the operator system. 800/441-5059; www.nlbcorp.com.



Heavy-duty steam units

Enclosed steam trucks from **CIPP Services** feature fuel-efficient Clayton steam units and offer protection from rain, snow and ultraviolet ray damage, which reduces maintenance and keeps units running longer. Trucks include 3.5 or 5 million Btu steam boilers, diesel-powered air compressors with up to 375 cfm output, MultiQuip three-phase diesel-powered 25 Kva generators, inline water softener treatment system and a central operators station inside the truck body with fold-up access staircase. Trucks are equipped with system drains to purge water for easy winterization when not in use. 815/712-8708; www.cipp-services.com.



Compact, expandable gas monitor

The **GX-2012** confined-space multi-gas monitor from **RKI Instruments** is the company's smallest personal five-sensor gas monitor weighing only 12.3 ounces. The handheld unit uses micro-sensor technology to measure oxygen, methane gas, carbon monoxide and hydrogen sulfide, and is also designed to add a fifth sensor when necessary. The detector has a low cost for the entry-level market, has glove-friendly large buttons, high-impact protective rubber covering, utilizes an easy-read automatic backlight during alarms, and is powered by lithium ion or alkaline batteries. 800/754-5165; www.rkiinstruments.com.



Simple, steerable camera

The **Rovver X** steerable six-wheel drive camera crawler from **Envirosight** provides extended crawl range with a touchscreen control pendant. Twin multifunction joysticks simplify operation, and MPEG video and JPEG still images can be uploaded directly to WinCan software. The crawler and pendant connect directly to the video cable reel without a control unit. The system also includes a detachable remote-operated camera lift, three onboard cameras and an integrated sensor package. 973/252-6700; www.envirosight.com.



Metering device for fats, oils and grease

The **F.O.G. Buster** system from **F.S. Solutions** meters the amount of detergent used to clean pipes that have a lot of buildup of fats oils and grease, such as sewer lines near restaurants. The unit comes with a 25-gallon detergent tank and can be easily retrofitted for an existing work truck or specified for a new truck. The detergent solution goes down the line, foams up over 10-15 minutes to liquefy greases and coats the pipe for a longer-lasting solution to prevent buildup. The meter improves efficiency, reduces water usage and can be shut off when not needed. 800/822-2253; www.fssolutionsgroup.com.



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Under-dash truck GPS device

The **NTX5B** under-dash GPS tracking device from **US Fleet Tracking** enables fleets with a few or 500 trucks to follow trucks in real-time as they run routes for maximum productivity. The system updates latitude, longitude, heading and speed of a vehicle every 10 seconds, and keeps 90 days of history. Records can be saved for up to a year. The system works with third-party software for dispatching. Data is sent through satellite networks. 405/749-1105; www.usft.com.



Short-run lining alternative

EcoCast Advanced Geopolymer from **Inland Pipe Rehabilitation** is designed for pressure pipe repair. The spray-in liner provides structural repair for manholes and large-diameter sewer and storm sewer pipe with as little as a half inch of material. The product is billed as a strong alternative to CIPP on smaller lengths of pipe, according to the manufacturer. An antimicrobial component can be added for protection against hydrogen sulfide gases. 281/362-1131; www.pmconst.com.



New way to scan pipes

The **ES-38** electro scanner from **Electro Scan Inc.** is designed for scanning laterals 3 to 8 inches in diameter, and can cover 30 feet per minute. Electrical variances — where electricity (and water) is flowing through cracks, leaks or defects in non-metallic pipes and associated distance measurements are transmitted to a smartphone application (included) to display and record defect locations and relative size. The probe includes 200 feet of 1/4-inch fiberglass pushrod. An optional printer and the ES-Air Push Rod are also available. 800/975-6149; www.electroscan.com.



Versatile transitional liner

The **Transition Liner** from **Easy Liner** is an elastic, knitted inversion liner that handles lining through 4- to 6-inch pipe transitions and also works on straight runs of 4-, 5- and 6-inch pipe. The liner negotiates 90-degree bends with minimal wrinkling and maintains a thickness of 3.5-mm when expanded to 6 inches. It is ambient-cured with a 90-minute cure time and works with most epoxy, polyester and silicate resins. 888/639-7717; www.easy-liner.com.



Single conductor camera

The **TrakSTARII** from **RS Technical Services** is a microprocessor-controlled single conductor camera that is half the size of the TrakSTAR and is designed to fit on the TranSTARII steerable tractor. Other features include 40:1 zoom, pan and tilt, auto iris and focus, adjustable lighting and internal condition sensors. 800/767-1974; www.rstechserv.com.



Double-duty nozzles

The **Rotodrill** nozzle from **Enz USA** features a rotating front jet for improved cutting performance and efficient cleaning. It combines the flushing capability of a standard nozzle and the penetrating and cutting capabilities of a hydroexcavation nozzle in one unit. It is available in 1/2-, 3/4- and 1-inch systems. 877/369-8721; www.enzusainc.com.



Main trunk condition assessment

The **HD Profiler** system from **RedZone Robotics** is a laser/sonar/video assessment system deployable up to 10,000 feet in pipes ranging in size from 30 to 118 inches. Additional features include integrated corrosion/debris measurement, V-360 virtual pan/tilt/zoom, and 3D pipe-line modeling. 412/476-8980; www.redzone.com.



Lightweight debris grabber

The **Puma Grabber** from **Southland Tool Mfg.** is a lightweight tool with a three-pronged grabbing head used for removal of debris and heavy objects from manholes. Made of aluminum, it is available in 6-, 12- and 18-foot lengths, and the 18-foot length can also be used in 6- and 12-foot configurations. 714/632-8198; www.southlandtool.com.



Manhole infiltration prevention

The **Internal Uni-Band** manhole grade adjustment sealing method from **Sealing Systems Inc.** has a polyisoprene rubber foam backing to ensure a watertight seal over the irregular surface of the structure and 16-gauge stainless steel bands at the top and bottom with turnbuckles to allow for precise adjustment to create a secure fit. 800/478-2054; www.ssisealingsystems.com.



Updated manhole adjustment system

The **PRO-RING** manhole adjustment system from **Cretex Specialty Products** is made of expanded polypropylene and comes in a new, larger size of 40-inch O.D. by 31-inch I.D. Featuring an improvement to the interlocking system, this product has an adhesive trench in lieu of the previous tongue-and-groove design. 800/345-3764; www.cretexseals.com.



Versatile pump controller

The new **EMS PRO** and **EMS PRO Lite** pump controllers from **FW Murphy** meet the varying needs of industrial, engine-driven equipment applications. The EMS PRO all-in-one controller is made for use across multiple engine lines. It features numerous start/stop and throttling options via the back-lit operator interface mounted behind a lockable door. 918/317-4100; www.fwmurphy.com.



Controlled-speed nozzle

The new **Rotor** nozzle from **USB-Sewer Equipment Corporation** uses magnets around the shaft to control speeds. The nozzle utilizes Advanced Optimized 3D HydroMechanics, with two jets that serve as drivers and two as brakes. It has double-sealed bearings, requires no lubrication and is well suited for removing grease and scaling. It is available in sizes for 6- to 24-inch sewer lines. 770/984-8880; www.usbsec.com.



Bigger UV light

The **LQ-30** from **Reline America Inc.** is a new model of UV fiberglass and resin curing light train for pipes from 24 to 48 inches in diameter. The legs are extendable to properly guide the light train down pipes of various sizes. 866/998-0808; www.relineamerica.com.



New partnership

Sekisui SPR Americas has partnered with **Innovative Sewer Technologies (I.S.T.)** to distribute their line of **Lateral Technology Systems**. 866/627-7772; www.sekisui-spr.com.



New low-profile plunger pump

The **HPL 120-30** low-profile, reciprocating plunger pump from **Myers Pentair Water** is designed for mobile sewer jetting applications. The pump delivers up to 120 gpm at a maximum discharge pressure of 3,000 psi. Features include side-gear reduction, open cradle, independent and removable stuffing boxes, spin-on oil filter and pressurized power end lubrication. **419/289-1144; www.myersaplex.com/hpl120.**



New trailer drain jetter

The **EJT** series of economy drain jetters from **Cam Spray** feature a 28 hp Honda engine with flows and pressures at 7 gpm at 4,000 psi or 11.5 gpm at 2,700 psi. Models include a manual reel with 250 feet of 3/8-inch or 1/2-inch hose for jetting 6- to 10-inch lines. Features include an industrial three-plunger pump with stainless valves and ceramic plungers, power pulse valve, air purge and recirculation for freeze protection, a 5-gallon fuel tank, heavy-duty trailer, 2-inch ball hitch and 150-gallon water tank with auto-shutoff. **800/648-5011; www.camspray.com.**



Versatile truck jetter for municipal work

The **Dyna-Jet 6520** truck jet from **Dyna-Vac Equipment** features a 65-gpm, 2,000-psi truck-mounted PTO-drive jetting system with a 600-foot hose reel designed to serve the municipal sector for use on larger sewer lines, culverts and storm drains. The swivel reel provides easy access on both sides of the truck and to line up with manholes, and stows inside the insulated, heated box on the back of the truck to prevent freezing in cold weather. **888/298-8668; www.dynavacequipment.com.**



Built to handle tough jobs

The **XtremeFlow (model HJ2TA1736)** twin-engine, twin-reel hot-water jetter from **Hot Jet USA (Power Line Industries Inc.)** delivers up to 17 gpm at 3,600 psi of hot or cold water. Features include twin 35 hp Vanguard gasoline engines and pump units and two onboard hose reels: one with 300 feet of 3/8-inch Piranha hose and one with 300 feet of 1/2-inch Piranha hose (rated to 150 degrees) and standard 1/2- and 3/8-inch nozzles. The jetters are mounted on a 5-foot by 12-foot trailer. **800/213-3272; www.hotjetusa.com.**

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High-pressure jetter

The 6,000 psi **Platform Series** high-pressure jetting unit from **US Jetting** for sewer and drain cleaning applications features a seven-position swivel hose reel, jump jet pulsation system and 325-gallon HDPE water tank. The 6018 run dry pump allows for outputs of 6,000, 5,000 or 4,000 psi at 18 gpm. 800/538-8464; www.usjetting.com.



I&I control for less

The **Pure Fused** calcium aluminate mortar from **Madewell Products Corp.** is a stand-alone mortar with a high compression strength of 10,000 psi. The product was developed to control I&I issues where an epoxy topcoat for protection from hydrogen sulfide is not required. 800/741-8199; www.madewell.net.



Remote vehicle fishes cords

The Hound from **C-Tec** is a watertight remote control vehicle that fishes cords through 8-inch-diameter and larger pipe. It is housed in a heavy-duty stainless steel body, features an all-wheel drive asymmetrical traction system, and can cover 200 feet per minute. 866/993-0366; www.ctecworld.com.



Skids will not scratch

Epoxy-coated skids from **MAX-LIFE Mfg.** are designed for use in relined pipes and will not cut or scratch the new liner. Skids are coated with Scotchkote, a fusion-bonded epoxy coating. It has been tested and found to have negligible wear on relined pipe, according to the manufacturer. 888/873-6295; www.flexmax.com.



New hydroexcavator display panel

The **MC Advanced Series** hydroexcavator from **GapVax Inc.** features a monitoring system that enables the operator to observe and troubleshoot from a single display (one inside and one outside the cab) as well as control hydraulics, blower and water pump operations with a complement of gauges. 814/535-6766; www.gapvax.com.



Concentrated bacteria delivery

The **DrainCobra Biologi-cal System** from **Chemsearch - Ecoflow** automatically transforms three grams of Free-Flow pellets into 100 billion live bacteria in a water-filled and oxygen-rich vessel. It releases a dose of live bacteria to the drain system every two hours, and flushes completely once per day. 800/527-9919; www.chemsearch.com.



No-dig lateral repair

Mainline and lateral point repair systems from **Infrastructure Repair Systems Inc.** are available with push or pull lateral carrier and four weight options. The lateral repair system can navigate 90-degree turns. The no-dig, ambient-cure system can repair 4- to 36-inch-diameter pipe up to 15 feet in length. 877/327-4216; www.irsinc.net.



Portable jetter

The **M30E MaxBlast** electric jetter from **MyTana Mfg. Company** is a mainline jetter for 1 1/2- to 6-inch lines with 4 1/2 gpm at 3,000 psi. The jetter features a 25-foot heavy-duty power cord, 200 feet of 3/8-inch jetter hose, 75 feet of 1/8-inch hose, three stainless steel nozzles, a wand and wand nozzles. 800/328-8170; www.mytana.com.



Versatile milling robot

The **Power Cutter 200** from **Innovative Sewer Technologies (I.S.T.)** features a high-resolution front CCD camera with 200-degree swivel range, no external supply lines, a remote maintenance module and a zero position (reset) for all movable axes. 858/997-0004; www.ist-web.com.



Foaming FOG eliminator

The **Bio-Septic F.O.G.** liquid biocatalyst from **Municipal Sales Inc.** stimulates biological activity in sewage systems to increase the metabolic and reproductive rate of naturally occurring bacteria. It is applied using a foam generator to coat the entire surface of structures. 518/747-2044; www.municipalsales.net.

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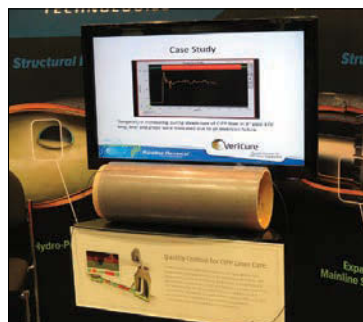
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The **VeriCure** system from **Pipeline Renewal Technologies** monitors cure temperature continuously along the entire length of a CIPP liner during installation. Readings are taken every inch and averaged into 18-inch zones, represented by real-time and historical data software tailored to CIPP professionals. The unobtrusive 3-mm probe preserves the flow of the liner. 866/936-8476; www.pipelinert.com.



Waterproof locator

The **ML-3** magnetic locator from **SubSurface Instruments** is fully waterproof (readings can be heard under water) with internally mounted controls for one-hand keypad control. Available in 40- (short) and 55-inch (long) models, the locator is made of aircraft-grade aluminum and has an LCD meter with bar graph that expands according to signal strength and a "+" or "-" that illuminates above the graph to indicate polarity. 920/347-1788; www.ssilocators.com.



No-dig point repair

The **QuickLock** no-dig point repair system from **Rausch Electronics USA** features a V4A stainless steel liner and EPDM rubber compression seal that works in water and sewer lines. Two lock-and-gear mechanisms on either end of the sleeve lock into place when maximum compression pressure is reached. The entirely mechanical system needs no cure time and allows continuous flow during installation. 877/728-7241; www.rauschtv-usa.com. ♦



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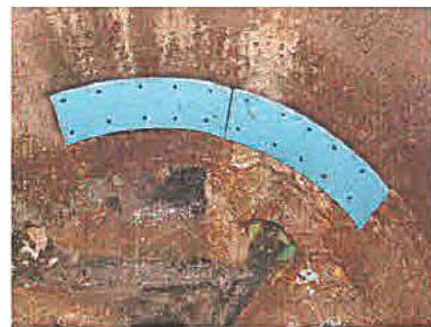
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We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets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

Kelley Dearing-Smith of the Louisville Water Company works with a group of students on a field trip. They are reading a map of the Ohio River.

TAKING AIM

Louisville Water Company volunteers help the community while building strategic business partnerships

By Ken Wysocky

Volunteer programs help water and sewer utility employees give back to their communities and generate public good will.

The Louisville (Ky.) Water Company takes that concept even farther, using volunteers to help establish relationships with organizations that can help achieve strategic goals. The program may even help the company find future employees.

Established in 2009, the utility's Stewardship Program is the brainchild of CEO Greg Heitzman.

"Greg is a strong believer in community involvement, right down to managers and employees," says Carl Blanton, manager of organizational effectiveness. "He wanted a formal program to get employees more involved in the community."

Judging from the numbers, the program is thriving. In 2010, about 15 percent of the utility's staff members donated 5,468 volunteer hours to various agencies and organizations. That's a 13 percent increase in hours over 2009. The volunteer work ranges from serving on or chairing boards to grassroots, hands-on activities.

Strategic approach

While many organizations offer employees more-or-less random volunteer opportunities, LWC has a cohesive, strategic volunteer program, organized in three tiers, each with a specific purpose. Overall, the work covers about 150 local agencies and organizations, and employees can nominate groups for each tier.

"We didn't want employees to

do something just to be doing it," says Kelley Dearing-Smith, manager of strategic communications. "The activities must have value — a benefit — for both parties."

Tier one takes in nonprofit organizations whose work aligns directly with LWC's mission, strategic vision or regional business strategy. LWC identified 47 such organizations, and in 2010, employees served 45 of them.

Groups in tier one include Greater Louisville Inc., the Center for Infrastructure Research at the University of Louisville, the Jefferson County Fire Service, the Louisville Fire Department, the American Water Works Association, and EDGE Outreach, an international nonprofit that helps provide safe drinking water in developing countries.

Tier two groups include nonprofit social groups, businesses and educational institutions that have a secondary connection with LWC. There are 51 such groups, and in 2010, employees helped 45, including the Louisville Chapter of the American Red Cross, the University of Louisville — J.B. Speed School of Engineering, and the Leadership Louisville Center.

"The American Red Cross is a good example because we can provide it with bottled drinking water during emergencies within the city, and can help the organization distribute them," Blanton says.

Hands-on volunteerism

Tier three groups provide more traditional volunteer opportunities. There are 53 such community-based organizations, including Big Brothers/Big Sisters of Kentuckiana, the greater Kentucky Chapter of the March of Dimes, the Louisville Area Command of the Salvation Army and the Kentuckiana Chapter of the Juvenile Diabetes Research Foundation.

"These groups have no connection to us except that they're here in the community we serve," Blanton says. "They make our community a better place to live, so we want to support them, too. We want people to know we're interested in more than just getting water safely from Point A to Point B."

"This tier is where a lot of our employees are interested in helping. Many who volunteer for these groups belong to the organizations or have benefited from them."

LWC employees volunteered at 23 of those organizations in 2010, giving 1,158 hours of volunteer work in 2010.

Wide range of benefits

Some volunteer opportunities yield less tangible, long-term benefits. For example, a local Archi-

"We didn't want employees to do something just to be doing it. The activities must have value — a benefit — for both parties."

Kelley Dearing-Smith

itecture, Construction and Engineering (ACE) mentoring program helps attract young people to the engineering profession "that could help us with our future operations," Blanton says.

The same concept applies to a heavy-equipment science program at a local high school, where the utility may spot promising young tradespeople.

"We look at students in their senior year who are interested in heavy equipment and construction trades and try to hire them for summer employment," Blanton says.

"That way, they can gain experience from our trained employees. It gives them something to put on their resumes."

In another case, involvement with the Jefferson County Fire Service and Jefferson County Fire Chiefs Association helped the utility forge a fire-hydrant maintenance agreement. "We used to do all of the maintenance on fire hydrants — exercising valves, painting hydrants and flushing them," Blanton says. "But we couldn't do as many as we wanted, so we worked out an agreement to pay them to do the maintenance."

"By combining forces, we're able to accomplish a lot more, and having established relationships through volunteer work helped us to more easily set up the program. You already know the right people and can get your foot in the door with proposing an idea."

Adds Dearing-Smith: "Established relationships help get things off the ground. It's not like you're sitting at a table with strangers because you already know them. And you really save time because you already know if they'll be a good partner."

Aiming for synergy

One of the best examples of a synergistic match for the utility's volunteer efforts is Smile Kentucky. Based on a partnership between the utility, the Louisville Dental

Society and the University of Louisville School of Dentistry, the program provides free annual dental screenings and treatment for children in grades 3-6 in metropolitan Louisville and surrounding counties.

"Public health is at the core of what a water utility does, so we hang our hat on things that provide overall better health for the community," says Dearing-Smith. "In this program, we coordinate educational efforts. We're in the schools, grades K-8, teaching dental health and touting water as a healthy choice. We reach about 14,000 students a year."

The volunteer program also offers public relations benefits. For instance, it provides good touch points to talk with customers about things such as fire protection and water quality — opportunities LWC otherwise might not enjoy. It also helps people understand the value of water and LWC's



A Louisville Water employee volunteers his knowledge in Haiti after the devastating 2010 earthquake.

role in delivering a quality product. That, in turn, can make it easier when the utility needs funding for new infrastructure.

"It's good PR, but that's not the whole reason for doing it," says Dearing-Smith. "It's just one of those things that in your gut you know is the right thing to do." ♦



LWC employees at Kentucky Construction Day show high school seniors the jobs available to them in the skilled labor area.

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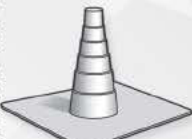


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SUSTAINING AN INSPECTION STANDARD

Appropriate updates are critical to maintaining integrity of PACP

By Ted DeBoda, P.E.

For many years now, you have heard PACP (the Pipeline Assessment and Certification Program) proclaimed as “the standard” in pipeline inspection. It is important to understand how it became the U.S. standard and how we can keep it current without losing the qualities of the standard.

PACP was initiated in 2002 at a time when many large consent decrees were being negotiated between municipalities and the U.S. EPA. For those of us who worked with CCTV data at that time, PACP was a welcome standard that defined many pipe defects, including the difference between fractured and broken pipe. While many

system owners had developed their own standard, it soon became obvious that adopting a national standard would not only leave the responsibility for administering the program to someone else (NASSCO), but as more contractors became certified and proficient in PACP, it encouraged more competition in the marketplace.

Another reason PACP became a successful standard was its ability to accept data using technologies other than CCTV cameras, without the need for significant changes. As an example, PACP has the ability to record percent deformation in the percent column for CCTV observations, but we know that laser profiling provides a much more accurate measurement of the cross-sectional area lost than can be seen with just CCTV. Sonar has been used to record the volume of deposits that are underwater and cannot be seen.

NASSCO will be making significant changes to help incorporate new technologies and meet the needs of the industry in 2013.

As we move toward more sophisticated equipment to provide quantitative and qualitative inspection data on our pipes, and even the soil surrounding the pipes, we need to be mindful of the ramifications that significant modifications can have on PACP’s qualities as a standard.

Certainly, we have competing requirements. On one hand, we want to keep PACP current and relevant by addressing current technologies and applying new knowledge of rehabilitation technologies. On the other hand, we need to guard PACP from being a moving target in which software vendors need to constantly update their products, and users need to constantly review new codes and processes.

In 2010, NASSCO made some

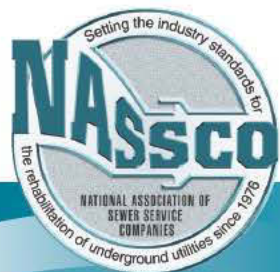
relatively significant changes (Version 6.0) to incorporate new codes and modify MACP (Manhole Assessment Certification Program) to include the level 1 and level 2 inspections. This year, we plan to make several minor modifications to PACP, including clarification of some of the verbiage and improved training material, but these improvements will mostly provide the same basic material in an updated format.

Another relatively minor modification to PACP includes allowing entry of fracture lengths (for non-continuous defects) and widths. Fracture widths can now be measured with significant accuracy, and this data can be entered in the “value 2nd” column of the details form.

It is important to note that NASSCO will be making significant changes to help incorporate new technologies and meet the needs of the industry in 2013. Since it is important that we do not make major changes for several years after these updates are made, it is critical that we get it right the first time. We have many members who use these technologies successfully and we hope to work with them to make sure we meet their needs.

That said, I ask qualified members of our industry to get involved in helping us evolve PACP to meet our needs while maintaining the standard we have enjoyed all these years. We need to prepare now, as 2013 is right around the corner. Feel free to send me an email to express your interest in helping PACP meet these needs. ♦

Ted DeBoda is executive director of NASSCO. He can be reached at director@nassco.org. NASSCO is at 11521 Cronridge Drive, Suite J, Owings Mills, MD 21117



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MANHOLES AND CATCH BASINS

By Briana Jones

Manhole renewal

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Dynarail handrail and ladder systems from **Fibergrate** combine corrosion resistance with long life and low maintenance. Lightweight components make installation easy. The handrail line includes everything to install OSHA- and IBC-compliant horizontal and inclined handrail systems with two or three rails. Specialty picketed handrail systems are also available.

The ladder line includes ladders, standard walk-thrus and safety cages. The retractable walk-thru is available for manholes, pits or indoor roof access points where covers are used. **972/250-1633; www.fibergrate.com.**



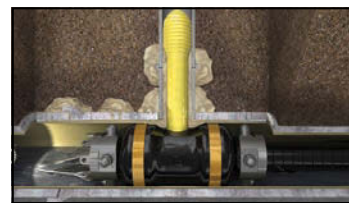
Manhole ventilation

The **Ripcord** ventilator/stringer from **Hurco Technologies** ventilates sewer manholes and makes it easy to get ropes and cables through pipe for testing procedures. It comes in two sizes: the standard Ripcord at 4,200 cfm and the Super Ripcord at 8,000 cfm. The ventilator uses a spark-proof, solid-cast aluminum impeller to ensure high airflow and high static pressures. The impeller is precision balanced for smooth performance. The unit comes with a standard 30-inch ring and fits on most manhole configurations. It can be modified for special applications. The ventilator can be used to pull deflection testing gauges through pipelines. **800/888-1436; www.gethurco.com.**



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Manhole seals

Manhole chimney seals from **Cretex Specialty Products** stop water inflow between the manhole frame and chimney. The seals consist of a rubber sleeve and stainless steel bands. The bands are designed to compress the rubber sealing fins against the frame and the chimney or cone section to create a watertight seal. The rubber sleeves are designed to allow for up to two inches of movement between the frame and the chimney so frost heave, soil movement, traffic loading or thermal expansion will not compromise the seal. The rubber can withstand pressures of 1,500 psi and meets ASTM C-923. The seals are available as internal or external. **800/345-3764; www.cretexseals.com.**



Grout rehabilitation

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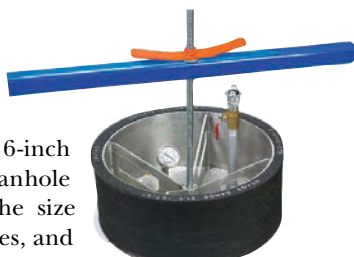
Epoxy coating

Infraguard topcoat and chim coat from **Infra-structure Repair Systems** are two-component, non-hazardous ambient cure, trowel or brush-on epoxy systems for small concrete patches, manholes and retaining walls. Chim coat's flexible feature maintains adhesion while expanding and contracting with changing temperatures. Both products are easy to apply, corrosion resistant, and have superior adhesion to most surfaces. **877/327-4216; www.irsi.net.**



Multisize test heads

Lansas multisize vacuum bladder test heads use the company's wide bladder technology, giving the units a 6-inch sealing range. Three sizes cover manhole openings from 21.5 to 36 inches. The size ranges are 21.5-27.5 inches, 27-33 inches, and 30-36 inches. Made of lightweight aluminum, the test heads include built-in handles for easy lifting and lowering the units in and out of manhole openings. A super wingnut makes it easy to adjust the height of the bladder. **800/452-4902; www.lansas.com.**



Manhole liner

CIPMH (cured-in-place manhole) liners for chimney or full-depth manhole lining from **LMK Technologies** eliminate infiltration and inflow through manhole walls. The universal-sized manhole liners resist freeze-thaw cycles and create a watertight, corrosion-resistant structural lining. The liners fit all manholes, including barrel sections, eccentric and concentric cones constructed of brick and mortar, precast, or block.

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Cleaning nozzle

The **Alphajet** nozzle from **USB-Sewer Equipment Corporation** is designed to clean grease, sludge and crusts from lift stations and manholes prior to rehabilitations. The nozzle is actuated by water from the pressurized hose of a jetter truck. Four driving nozzles cause 360-degree controlled rotation in a horizontal plane, which eliminates the need to cover the manhole. The horizontal rotation allows for observation of the cleaning progress. The body requires no lubrication or replacement of internal mechanical parts within the first 12 months of operation. Driving nozzles can be extended to accommodate various sizes of manholes/lift stations. **866/408-2814; www.usbsec.com.**



Drop bowls

Inside Drop Bowls from **RELINER/Duran** eliminate outside drops in manholes and clean up failed inside drops. When used in wet wells to eliminate uncontrolled drops, they prevent pump cavitation, prevent aerated influent from being drawn into the pumps and increase pump life. Made of marine-grade fiberglass, the bowls are simple to attach to the manhole wall with stainless steel expansion bolts.

By providing easy cleaning and inspection from grade level, maintenance time and cost are reduced and their compact, low profile provides full access to areas below. The units are available for outlets ranging from 4 to 24 inches for box and round structures in most diameters. High-quality, laser cut, stainless pipe supports for the drop pipe are available. **800/508-6001; www.reliner.com.**



Manhole protection

Manhole Guard from **Southern Sewer Equipment Sales** enhances open manhole safety. The durable, lightweight plastic cylinder reduces the chances for slips and falls by workers and pedestrians into open manholes. Injury time loss and replacement tool cost are decreased by the 6-inch rise above the manhole surface. The unit is available in round models, fitting most manhole and storm drain applications. The optional hose guide reduces wear on sewer hoses. The roller guide option reduces wear on camera cables and grout lines. Other accessories include a lid, LED kit and bypass kit. **800/782-4134; www.manholeguard.com.**



Polymer cover

FiberShield from **McGard** is a polymer cover that weighs 80 percent less than cast iron, while maintaining an H₂O and EN124 rating. The system is easy to handle and transport, and installs and removes in seconds without bending over. The integrated locking system prevents removal and requires a registered key to operate. **888/888-9192; www.mcgard.com/security.**



Fixed-point gas monitor

The **iTrans** fixed-point gas monitor from **Oldham** employs an intelligent electronics platform to provide one or two points of detection from a single head for maximum flexibility, high performance and low installation costs. The unit uses smart sensor technology and safety features including automatic sensor recognition, access code security, and zero and cal fault protection. The monitor is all enclosed within an explosion-proof aluminum or stainless steel housing. The microprocessor-controlled transmitters are capable of independent operations, allowing for remote sensors or multipoint system configuration. **800/338-3287; www.oldhamgas.com.**

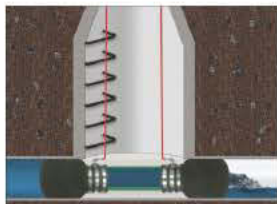


(continued)

PRODUCT FOCUS MANHOLES AND CATCH BASINS

Flow diversion

Large flow-thru **pipe plugs** from **Logiball** divert flows during work on manhole structures. The double-action bladders offer optimum flow capabilities and save on costs in bypass pumping charges. Many configurations are available. 800/246-5988; www.logiball.com.



Manhole cutting teeth

Plug-in teeth for the Six Shooter manhole cutter from **Mr. Manhole** can be replaced or rearranged, even on the job site. The teeth are made of hard carbide, providing long cutting life. The shape and reduced size allow for high performance when cutting in hard concrete. All teeth are the same, so they can be rearranged if the front teeth become dull. 419/229-3015; www.mrmanhole.com.



Polymer concrete

Steel-reinforced **precast polymer concrete** from **U.S. Composite Pipe** resists H₂S gas corrosion and is comprised of resin, acid insoluble aggregates and invert filler. It does not require any coatings or linings to protect it from corrosion. Once a polymer concrete structure is installed, there is no need to come back and apply a protective barrier and test it because the structure itself is the protection. The structures are capable of handling substantial live loading and deep installations with compression strengths above 9,000 psi. Manholes are available in standard ASTM C-478 4- to 16-foot diameters and the water-tight connections are achieved with rubber gaskets and flexible pipe-to-manhole connectors. 817/783-3444; www.uscompositepipe.com.



Cement mortar

SewerCrete from **GML Coatings** is a 100 percent fused calcium aluminate cement based mortar. The material contains aggregate and polypropylene fibers, which are resistant to hydrogen sulfide attack. The product components also fight against microbial growth, which can lead to early deterioration of concrete from sulfuric acid. The one-component, polymer-modified, cementitious mortar can be applied overhead, vertically, and horizontally, demonstrating high bonding properties. Application thickness ranges from 1/2 inch to 3 inches.



Contractors or municipal employees can easily use the product to rehabilitate or patch brick manholes and a variety of precast concrete structures. The mortar offers easy shaping and molding, and can be trowel or spray applied and given a brushed finish. Complementary products include SewerCrete Leak Stop, an injection grout, and SewerCrete Hydraulic Cement for preparation before application of the mortar. 941/755-2176; www.sewercrete.com. ♦



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Flexible epoxy repairs manhole chimneys

Problem

Inflow and infiltration entering the sewer system through manholes during wet weather caused severe overflows at the three New Lenox (Ill.) Wastewater Treatment Plants. Senior operator Keith McKeen looked for a cost-effective and easy way to remove as much I&I as possible.

Solution

The village applied **Parsonpoxy FP** from **Parson Environmental Products** to manhole frames where they meet the riser rings. The two-component, flexible, 100-percent solids polyamine epoxy absorbs stresses created when cracks and joints move with freeze and thaw cycles. The corrosion-resistant and waterproof epoxy is applied to dry surfaces with a putty knife or brush.

RESULT

"The compound is cheaper per manhole than purchasing chimney seals, and is easily and correctly applied by our summer staff," says McKeen. "It also has greatly reduced our I&I problem." 800/356-9023; www.parsonenvironmental.com.



Fast-curing spray revives recreational lake

Problem

Lake Heron's 42-foot-diameter, 20-foot-deep corrugated metal overflow manhole leaked enough to lower water levels, causing the City of Liverpool, Pa., to prohibit recreational activities. Officials looked for a corrosion barrier with structural strength.

Solution

The municipality chose **SprayWall**, a 100-percent volatile organic compounds-free self-priming polyurethane coating from **Sprayroq**.

To reach the manhole four feet from shore and surrounded by thin ice, city workers built a wooden walkway to dissipate their weight. They eliminated infiltration by pumping chemical grout into the numerous holes, then dried the walls with a blower.

Workers sprayed multiple applications of the coating to build up a 12-inch-thick layer. The product's formula enables initial curing in less than 30 seconds. The material has a 50-year design life, retaining 70 percent of its original flex modulus.

RESULT

The project took two days and water levels returned to normal. 205/957-0020; www.sprayroq.net.



Lining system restores pump station

Problem

After only five years of service, operators at the Washington (N.C.) Wastewater Treatment Plant noticed significant concrete deterioration from hydrogen sulfide in its main sewer pump station. The city considered a mortar/epoxy liner, HDPE liner, or a multi-layered polymeric lining system to rehabilitate the structure.

Solution

The city received quotes on the first two systems and chose the mortar/epoxy liner as the most affordable. Then **SpectraShield** provided a quote competitive enough for the city to change its mind.

After setting up the bypass systems, utility workers cleaned the station. The SpectraShield team built scaffolding inside the 20- by 30- by 36-foot-deep wet well, abraded the walls, then bored into them and injected fast-acting **SpectraGrout** to stop severe leaks. They plugged minor leaks with quick-setting hydraulic cement.

The first layer of the SpectraShield system is a primer designed for saturated concrete. The thin film provides adhesion to the substrate. After the primer dried the required four hours, the crew sprayed on a layer of silicone-modified polyurea, followed by a layer of tight closed-cell polyurethane foam to fill voids and restore placement.

The foam dried tack-free in 8 to 12 seconds. The crew then applied a second thin film of silicone-modified polyurea as the final corrosion barrier. It dried just as quickly. The pump station was rehabilitated in a week.



RESULT

The project was completed two weeks ahead of schedule and 8 percent under budget. 800/284-2030; www.spectrashield.com.

Turnbuckle risers solve resurfacing problem

Problem

Transportation and Public Works crews in Fort Worth, Texas, paved over utilities as they resurfaced 300 to 400 streets annually, then returned to raise the manholes to grade by pouring concrete collars. "The mismatch between the new asphalt and cement caused cracked concrete, bumps, and other problems at the joint," says George Behmanesh, P.E., assistant director of the department.

Solution

The city purchased pivoted turnbuckle **manhole risers** from **American Highway Products** and installed them before paving the streets. The solution was faster, more durable, and less expensive than previous methods.



RESULT

The risers, in use for 12 years, ended incompatibility issues between materials. "So far, we have received no complaints and have not had a riser fail," says Behmanesh. 888/272-2397; www.ahp1.com. ♦

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Atlas Copco acquires Houston Service Industries

Atlas Copco North America LLC acquired Houston Service Industries Inc., a U.S. manufacturer of low-pressure blowers and vacuum pumps.

NozzTeq names DeCarlo VP of sales

NozzTeq Inc. named Anthony "Tony" DeCarlo vice president of sales. He will continue working directly with customers in 19 states and authorized dealers throughout North America.

Jetter Depot names Pisaniello sales manager

Jetter Depot named Kim Pisaniello sales manager for its Atlanta location. Pisaniello has 16 years of industry experience and will be responsible for sales, service and customer support.

Vermeer launches HDD tooling online warehouse

The BORESTORE tooling and accessories online warehouse from Vermeer Corp. (www.borestore.com) makes the company's horizontal drill tooling and accessories available to contractors 24/7.

ADS opens second Michigan facility

Advanced Drainage Systems Inc. opened a manufacturing plant in Clifford, Mich. The plant is the company's second Michigan manufacturing facility and will make HDPE pipe for the region's agricultural and commercial markets.

Azteca Systems opens Wisconsin Cityworks office

Azteca Systems Inc. opened an office in West Bend, Wis., for its Cityworks customers in the Great Lakes Region. The office provides customer support, sales, services and training for its GIS-centric asset management systems.

Hach names Brown corporate accounts manager

Dave Brown joined the Hach Flow team as corporate accounts manager. His experience includes business development, management and customer support. ♦

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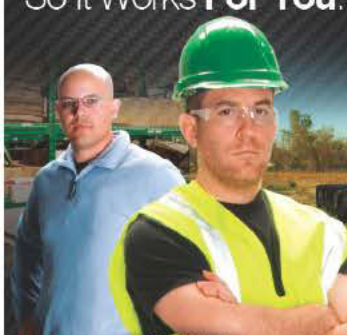
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4" Percussion Milling Cutter Enz Golden Jet for 3/4" - 1" hose version 14.100. LIKE NEW - used on one job! \$3,500. Plumbing Anytime, Inc. 307-733-3534, WY. (CMBM)

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SUPERINTENDENT OF WATER RECLAMATION ATHENS-CLARKE COUNTY UNIFIED GOVERNMENT, ATHENS, GA The purpose of this job is to perform managerial and technical functions associated with operations of Water Pollution Control facilities and compliance with EPA and EPD guidelines. TO APPLY: The job description, application and questionnaire may be downloaded from our website at www.athensclarkecounty.com. Athens-Clarke County does not discriminate on the basis of disabled status. The telecommunication device for the deaf (TDD) number is (706) 613-3115. Qualified applicants must possess: 1. Bachelor's Degree in Water Distribution/Wastewater Management or related discipline; 2. Four years of experience involving water distribution/wastewater treatment services administration required; 3. Or any equivalent combination of education, training, and experience which provides the requisite knowledge, skills, and abilities for this job; 4. Two years of supervisory experience; 5. A Class I state certified license for wastewater treatment and Wastewater Laboratory Analyst as appropriate; and 6. A valid driver's license. See job description for further details. (M04)

POSITIONS AVAILABLE

SALES REPS: Looking for energetic and motivated, centrally located on East Coast. Sound transportation desired but not required. Send resumes to resume@nozzteq.com, or call 815-482-0600. (M04C05)

PUMPS-HIGH PRESSURE

Myers DP-80-20, 80 gpm/2,000 psi, fully refurbished jet pump for sale. \$8,750. Also have Vaccon parts for sale. Contact Ralph at 866-599-7378, NY. (M05)

SERVICE/REPAIR

Dynamic Repairs - Inspection Camera Repairs: 48 hour turn-around time. General Wire, Ratech, Ridgid, Electric Eel, Gator Cams, Insight Vision, Vision Intruders. Quality service on all brands. Rental equipment available. For more info. call Jack at 973-478-0893. Lodi, New Jersey. (CMPBM)

SEPTIC TRUCKS



2003 Sterling L7500 Vac Truck: Cat 3125 @ 315 HP, A/T, 55K miles, spring susp., 2003 Vac-Con V390LHAD, 3 compressor fans, 10' telescopic boom, HS drive, articulating hose reel, hi-dump debris tank.....\$99,500
715-546-2680 WI (MBM)

SEPTIC TRUCKS



1988 Ford L8000 Vac: Ford @ 210 hp, A/T, 81K miles, 6K hours, spring susp., spoke wheels, Vac-Con body, Cummins showing 1,292 hrs., s/n: V290T-0488186.\$22,500
715-546-2680 WI (MBM)



1978 Mack Vac Truck: Mack diesel, M/T, 10,500/19,040 axles, camelback susp., spoke wheels, 22.5 tires. \$24,500
715-546-2680 WI (MBM)



2006 Sterling LT9500 Vac Truck: Acert C-13, Fuller 8LL, lockers, 18/40 axles, 4x6 drive, air ride, 24K miles, 208" WB, 227" frame behind cab, 22.5 tires, engine brake, disc wheels, 2006 Presvac tank, s/n: APV-4000-0705-7052, 4,000 gal. tank, Masport pump.....\$89,500
715-546-2680 WI (MBM)

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PEOPLE/AWARDS

William Battaglin was named the president of the American Water Resources Association for 2012.

Warren County (Kentucky) announced the following Stormwater Stewardship Award winners:

- Project: Three Springs Park
- Plan Preparer: Arnold Consulting Engineering Services

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

LEARNING OPPORTUNITIES

American Public Works Association

The APWA is offering these courses:

- April 3 – Clients and Consultants: How to Work Together for the Best Possible Project, Audio/Web
 - April 6 – Self Assessment Using the Management Practices Manual, Tampa, Fla.
 - May 9 – Stormwater Manager Certification Study Guide Part 1, Audio/Web
 - May 16 – Stormwater Manager Certification Study Guide Part 2, Audio/Web
 - May 23 – Stormwater Manager Certification Study Guide Part 3, Audio/Web
 - June 12 – Low Cost Safety Improvements, Audio/Web
- Visit www.apwa.net.

American Society of Civil Engineers

The ASCE is offering these courses:

- May 10-11 – Pumping Systems Design for Civil Engineers, Denver, Colo.
- May 10-11 – Structural Condition Assessment of Existing Structures, Madison, Wis.

Visit www.asce.org.

Wisconsin

The Wisconsin Department of Natural Resources is offering these courses:

- April 10 – Permit-Required Confined Space Entry, Janesville
- April 10 – Collection Systems, Chippewa Falls
- April 25 – Permit-Required Confined Space Entry, Spooner
- June 6 – Customer Service, Richfield
- June 7 – Collection Systems, Watertown

Visit www.dnr.state.wi.us.

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

- April 12-13 – Using WinSLAMM v. 10: Meeting Urban Stormwater Management Goals, Madison
 - April 23-24 – Using WinSLAMM v. 10: Meeting Urban Stormwater Management Goals, Baltimore, Md.
 - May 2-4 – Using HEC-RAS to Model Bridges, Culverts and Floodplains, Madison
 - May 7-9 – Using HEC-HMS to Model Watersheds, Madison
- Visit www.epdweb.engr.wisc.edu. ♦

CALENDAR

April 1-4

Virginia Rural Water Association Annual Conference, Roanoke, Va. Visit www.vrwa.org.

April 2-5

New Mexico Rural Water Association Annual Conference, Albuquerque, N.M. Visit www.nmrwa.org.

April 16-18

Oklahoma Rural Water Association Annual Conference, Oklahoma City, Okla. Visit www.okruralwater.org.

April 16-19

Wyoming Association of Rural Water Systems Annual Conference, Casper, Wyo. Visit www.warws.com.

April 23-26

California Rural Water Association Annual Conference, Lake Tahoe, Calif. Visit www.calruralwater.org.

April 29-May 2

American Public Works Association 2012 North American Snow Conference, Frontier Airlines Center, Milwaukee, Wis. Visit www.apwa.net.

May 2-3

Vermont Rural Water Association Annual Conference, Fairlee, Vt. Visit [www.vtruralwater.org](http://vtruralwater.org).

May 8

Georgia Association of Water Professionals Stormwater and Watershed Specialty Conference, College Park, Ga. View www.gawponline.org.

May 15-17

North Carolina Rural Water Association Annual Conference, Greensboro, N.C. Visit www.ncrwa.com.

May 19-21

Georgia Rural Water Association Annual Conference, Jekyll Island, Ga. Visit www.grwa.org.

May 21-23

Ohio Rural Water Association Annual Conference, Huron, Ohio. Visit www.ohioruralwater.org.

May 21-24

New York Rural Water Association Annual Conference, Verona, N.Y. Visit www.nyruralwater.org.

June 3-6

Water Environment Federation Collection Systems 2012: Show Me The Green – Confluence of Planning, Implementation and Regulations, St. Louis Convention Center, St. Louis, Mo. Call 703/684-2441 or visit www.wef.org.

June 10-14

ACEI 2: American Water Works Association Annual Conference and Exposition, Dallas, Texas. Visit www.awwa.org.

July 18-20

Water Environment Federation Stormwater Symposium 2012, Sheraton Baltimore City Center, Baltimore, Md. Visit www.wef.org.

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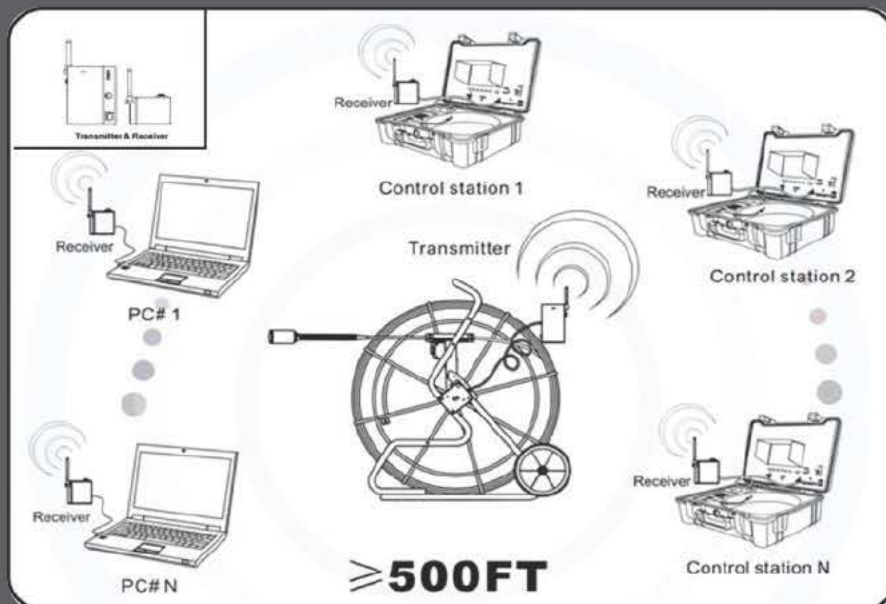
Municipal Sewer & Water invites your national, state or local association to post notices and news items in this column. Send contributions to editor@mswmag.com.



As a leading manufacturer of sewer and drain video inspection cameras, Forbest Products Co. has just launched the first **Wireless Pipe/ Duct Video Inspection System** and the first **(Wireless) Network Pipe/ Duct Video Inspection System** in the world. These two new systems offer you the most efficient way to inspect at a remote site or to communicate on site with your central office at a distance.

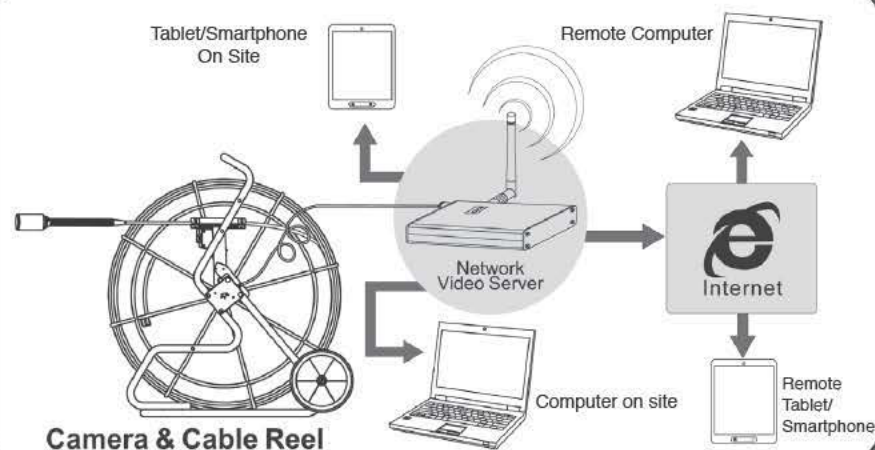
Wireless Pipe / Duct Video Inspection System

- With a "Forbest" Wireless Transmitter and Receiver, you can upgrade a "Forbest" video inspection camera to a wireless system, allowing you to watch the video/image captured by the camera on a "Forbest" control station or your own laptop/tablet up to 500 feet away from the cable reel.



Wireless Network Pipe/ Duct Video Inspection System

- With a "Forbest" network video server, you can watch the live video/image captured by the camera not only on a computer or a tablet/smartphone on site via Wi-Fi, but also on a computer or a tablet/smartphone connected to the Internet worldwide. Now you are able to discuss the issues of the inspection on site with your colleagues in the central office.



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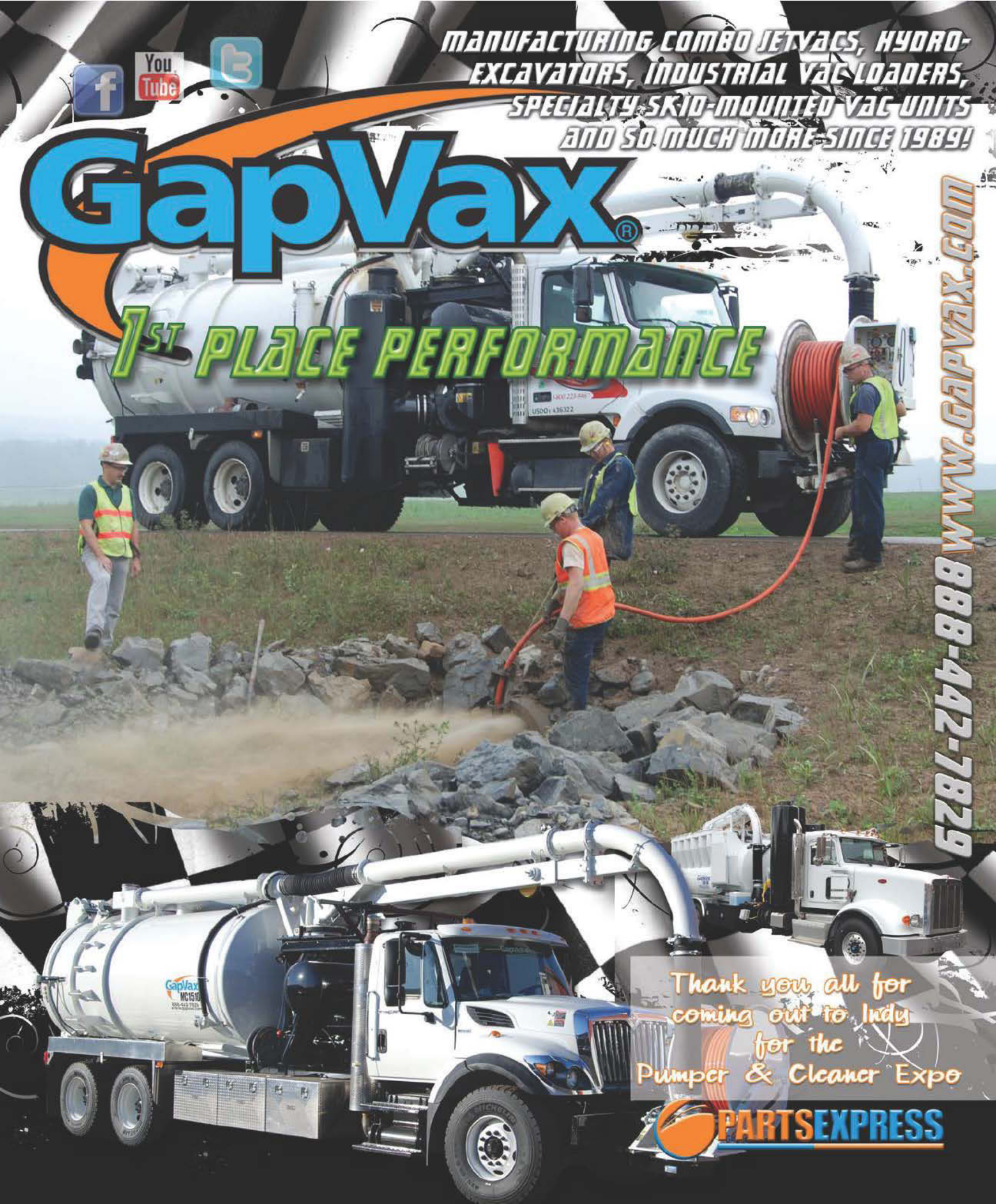


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