

A STAGED APPROACH TO GIS DEPLOYMENT

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TECHNOLOGY TEST DRIVE: INFRASTRUCTURE MANAGEMENT SYSTEM

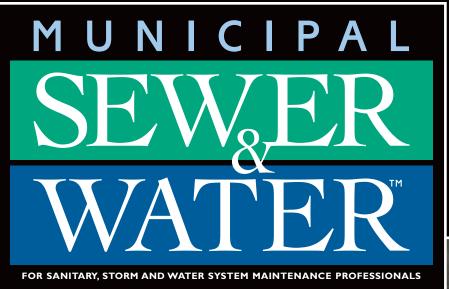
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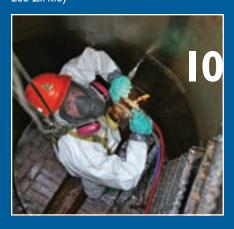






COVER:

The City of Aberdeen (Md.) Department of Public Works embarked on an aggressive plan to rehabilitate its sewer system. In a little more than three years, the system turned the corner, thanks to a diligent fourperson maintenance crew and outside consultants. Here, maintenance worker Tony Scantick grouts a manhole using Avanti grout. (Photography by Shannon Lee Zirkle)



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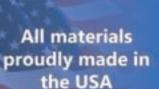
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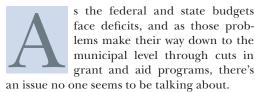


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CAUGHT IN THE VISE

At a time of austerity, what can be done to keep public employee compensation competitive and sustain workforce quality?



A lot of the budget cuts at all levels are falling on employees through pay freezes and reductions in benefits. That trend shows no sign of abating soon. So the issue is: At what point does compensation for public workers —

field crews and office staff alike — become so unattractive that good people simply leave? And remember, the best people always can.

I'm not going to bring in the issue of unions and bargaining rights, which seems to get most of the attention. My question deals with people, dollars and cents. Public agencies have to compete for

quality people, just as private businesses do. What happens if the public sector begins to look like nothing but a dead end, with a future of declining pay and lack of opportunity?

Public vs. private

A lot of people complain that public workers are paid too much, especially in benefits. But there's a key difference, seldom mentioned, between the public and private sectors. If I go to work at a large business, at whatever level, nothing says I can't work my way high up the ladder, even into the executive ranks, and ultimately earn a spectacular salary.

If I go to work for Any City, USA, I can only go up so far. Even if I become a department head, I am not likely to see a six-figure income (unless Any City happens to be a big one). So in effect I trade upward mobility for predictability, less pressure, good benefits and job security.

But if the benefits are no longer so good, if annual budget cuts mean the constant threat of layoffs, and if persistent shortages of funds mean increasing pressure to do more with less, then where is the upside to public jobs?

One could argue that maybe public employment shouldn't be a career proposition — that people who want more opportunity can simply leave after a while for private business. Fine, but if the good people are always leaving, where is the base of experience on a municipal team?

Maybe a way needs to be found within the structures of unions and civil service to fast-track exceptional workers, to provide merit bonuses, or to create something akin to profit sharing for people and teams who find ways to do things more efficiently and save money for the community.

What if the only ones who stay are those who can't get jobs anywhere else or those who are willing to stay on out of pure public spirit?

Isn't there a great deal of value in the 50- or 60-year-old public employee with decades of experience and a head filled with institutional knowledge? Doesn't that person deserve a financially rewarding life?

Time for innovation

In my role as editor at MSW, I regularly run across incredibly bright and dedicated people who add huge value to their communities. How do we continue paying people like that enough to keep them from jumping to the nearest engineering or IT firm or private utility, where there's no cap on their financial future?

There's a balance to be struck here. The well of tax money (or ratepayer money) is not infinite, and we're never going to see equal financial opportunity in the public and private



FROM THE EDITOR

Ted J. Rulseh

sectors. So we may need to start doing some things differently.

Marietta Water, subject of this month's "Human Side" column, is one innovator. Department director Bob Snelson has made it a requirement that his people attain appropriate levels of certification in water distribution and wastewater collection.

The initiative proves that employees respond to rewards other than money: Morale and retention have improved significantly as people

gain a sense of pride and professionalism and a belief that their employer cares about them.

Yet Snelson hints in the article that there's an issue brewing over compensation for these increasingly qualified and valuable people. Opportunities to advance are limited in a relatively small agency, and the city is looking for ways to structure pay

to increase rewards for longevity.

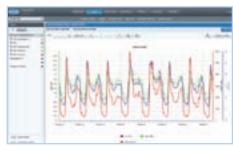
What's your story?

This issue is not going away. Maybe ways need to be found within the structures of unions and civil service to fast-track exceptional workers, to provide merit bonuses, or to create something akin to profit sharing for people and teams who find ways to do things more efficiently and save money for the community. (Would "savings sharing" be an appropriate term?)

MSW would be interested in your perspectives on this issue. Have you developed any innovative programs that help reward and retain your best people? Send me your comments to editor@mswmag.com. I promise to respond, and we'll report on the ideas we receive in a future issue. •

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ALL ABOARD

In a small city with a big I&I problem, an all-out education program led the city council and residents to support system rehab and in-house equipment upgrades



he City of Aberdeen lies about half an hour north of Baltimore. Founded in 1892, the wastewater system is a patchwork of upgrades subject to vicious bouts of inflow and infiltration (I&I).

Encouraging buy-in from the city's administration and citizens about the need for action, the Department of Public Works has embarked on an aggressive plan to rehabilitate the system. In a little more than three years, the system has turned the corner.

With a four-person maintenance crew and the help of outside consultants, the sewer system has been mapped with GIS coordinates, hydraulic modeling has been completed, and every manhole in the system has been inspected. The department is also embarking on an in-house grouting program.

Matt Lapinsky, director of public works, credits much of the drive behind the effort to Josh Quesenbery, who joined the department five years ago as a 19-year-old maintenance worker. Quesenbery hit the ground running, immediately looking for ways to improve the system.

"Josh brings a lot of fire and passion to the job," he says. Lapinsky describes the sewage system by borrowing a line from the Johnny

Collections manager Josh Quesenbery cleans a manhole using a Vactor truck in advance of a confined-space entry. (Photography by Shannon Lee Zirkle)

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Cash song, "One Piece at a Time."

"The main part is 200,000 feet of 8-inch vitrified clay, some Orangeburg pipe, and a lot of it is much older than that," says Lapinsky. "It's the great stuff that everybody in the I&I business loves. On the other hand, we have some pretty stringent regulations and design standards about what has gone in over the past 15 years."

I&I a big problem

However, the newer lines have barely dented the I&I totals. A preliminary study of the system indicated that I&I often overwhelmed the wastewater treatment plant, which processes an average of about 1.9 mgd.

Quesenbery and Lapinsky took the study and began to leverage the data to seek funding for a more thorough investigation. First on the agenda was explaining to the city council what I&I was and how it was affecting the city's infrastructure and water rates.

"You can't go before the politicians and the public and preach the message of I&I remediation unless you have documentation and facts to back you up," says Quesenbery. "We needed solid evidence. But you need to realize that you're never going to convince a small municipality to do everything overnight. It has to be incremental."

Since all of the department's

The Aberdeen collections team includes, from left, maintenance workers Kerry Ramming, Tony Scantick and Steve Jones, and collections system manager Josh Quesenbery. PROFILE: efforts are funded by water rates, in the older sections of town, City of Aberdeen

buy-in from residents was also crucial. Education extended to city streets, where department crew members always take time to explain to residents what they're doing and why it needs to be done. The department also produces a monthly newsletter aimed at resident education.

Quesenbery began to build on the I&I study by examining the infrastructure on an ad hoc basis whenever he could find the time. A 15-year-old trailer-drawn CCTV system wasn't a lot of help. "I



Josh Quesenbery

started to sink some more," says Quesenbery. "That's when I got out of there." The vehicle eventually

came to rest with the truck bed even with the sidewalk.

Only the fact that the truck was resting on a water line below prevented it from sinking further. Quesenbery was quick to use the misfortune to illustrate the dangers of I&I and the need for increased inspection and maintenance.

"Falling through the road was one thing that the city council and the townspeople understood," says Quesenbery. "I was glad it was me and not somebody else."

MAKING A CASE

Working for the Public Works Department in Aberdeen, Md., often means pulling double duty. In winter 2007, Josh Quesenbery, collections system manager, had pulled night snowplow duty.

"I was using a dump truck to plow the main street when all of a sudden, the road swallowed the truck whole," he recalls. Half an hour earlier, a city jetter had flushed out a backed-up sewer line, and the high-pressure jet had blown through about 50 feet of cracks in the vitrified clay. While the original void space underground had formed over an extended period, the jetting operation dealt a final blow to the road surface above.

"Somebody called me in the middle of the night saying Josh had fallen into a sinkhole and that we needed a crane to get him out," says Matt Lapinsky, director of public works. Quesenbery followed protocol, shutting off the truck's engine and waiting in the cab for rescue crews.

That is, until the truck began to sink again. "The tail end of the truck

(continued)

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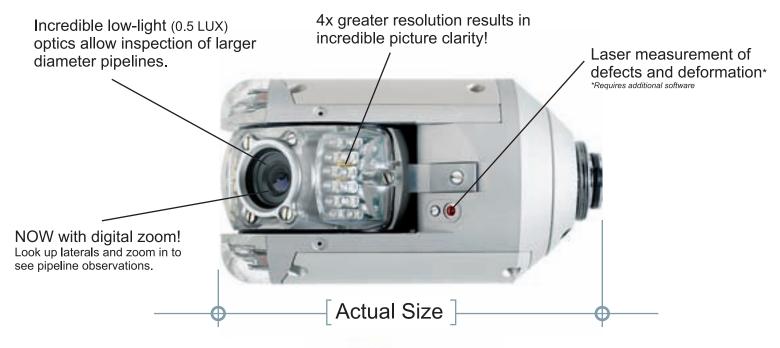
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Aberdeen maintenance worker Steve Jones keeps an eye on the Avanti chemicals used for manhole grouting.

didn't have a rigid plan at the time," says Quesenbery. "I was just going out and popping off manhole covers and checking the lines."

Taking it to council

Lapinsky made a direct pitch to the city council in 2008, presenting the findings of both the I&I study and staff observations. The department's objective was to have the council authorize the purchase of a dedicated inspection van to collect further data.

"Matt and I did our homework and made up a PowerPoint presentation that included graphs, maps and actual photos taken by the camera system showing infiltration and root problems," says Quesenbery. "We made it clear that these were problems in our own system, not just photos pulled from the Internet. I could tell them that this was a photo of the street they lived on. For budgetary reasons, it was not an easy sell."

The council approved the request, though, and the department soon took possession of a



combination unit on a Sterling chassis and an assortment of nozzles from KEG Technologies.

In-house, if possible

"We try to do as much work inhouse as possible," says Quesenbery. "We don't need to reinvent the wheel and go to outside contractors if there's already a wheel

"You can't go before the politicians and the public and preach the message of I&I remediation unless you have documentation and facts to back you up."

Josh Quesenbery

2008 Ford F-550 diesel truck with an Omni III Pan and Tilt Zoom Model 10-1650 camera from RS Technical Services, with pole and push-camera accessories.

"The camera truck was the fruit of our labor," says Lapinsky. "At that point, Josh went from maintenance work to the person in charge of inspection and was promoted to collections system manager. The camera was a means to gather more information and formulate a more elaborate action plan."

Quesenbery also took charge of a crew of three workers who perform a wide variety of functions, ranging from cleaning, inspection and root control to tap cutting, main replacement, manhole grouting and pipe lining. The department uses a dedicated Vactor 2100 available right here."

In October 2008, the department initiated a hydraulic model and flow monitoring study of the city. For the purposes of the study, they broke the city into nine distinct groundwater basins to see where I&I was worst.

The city contracted the local office of environmental engineering firm Stearns & Wheler GHD to prepare the hydraulic modeling. Rather than lease equipment, the council directly purchased a mix of a dozen Hach Sigma Model 910 and 920 flowmeters and 20 rain gauges by the same manufacturer from local rep firm North East Technical Sales of Harleysville, Pa. Insight software was used to analyze the data.

"We could see that three of the basins were in the worst shape, and we focused our repair activity on those," says Lapinsky. "The data doesn't lie. We can see what we're doing cost-effectively, and flow metering is the most important part of that."

Infiltration sources include leaking manholes, high ground-water entering the joints of vitrified clay pipe, and rainwater-derived I&I entering through holes and fractures in the clay. Exfiltration from storm drainpipes also allows rainwater to migrate through the ground to the sewers through open channels created by repeated water flow.

Quesenbery was actually looking forward to camera inspection of 34 storm drain inlets marked as suspicious during smoke testing, expecting to find significant sources of I&I there. The drains were actually in surprisingly good shape, indicating that further study was necessary.

A thorough map

In 2009, the department embarked on a more thorough study that included GIS mapping employing Real Time Kinematic satellite navigation, I&I quantification, manhole inspection, and a system smoke test. The study was funded jointly by the city and the Maryland Department of the Environment. The work was carried out by the Department of Public Works, Stearns & Wheler, and indepen-

dent state agency Maryland Environmental Service.

While satellites worked from the sky, Quesenbery and his crew provided ground support, supplementing the study with visual inspection and CCTV service. The study uncovered a surprising cache of hidden infrastructure that had dropped off the city's radar. "We found roughly 350 to 400 manholes we didn't know we had," he says. "We had to clear each one off and in some cases had to bring them back above grade."

The study also showed that the wastewater treatment plant processed a peak of 6.93 million gallons over a 24-hour period that year, about 5 million gallons of it from I&I. The smoke study, testing about 80 percent of the system, revealed a surprising statistic: As much as half the city's I&I originated on private property. In a mini-pilot program of 60 home inspections, the department found at least seven residences with sump pumps emptying directly into the sewer.

Private matters

"We believe that illegal connections and leaking clay laterals are a major contributor to I&I," says Quesenbery. "We're also finding roof and foundation drains going directly into the sewers. By removing these illegal connections, we believe we'll be able to

(continued)

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reduce I&I considerably."

The biggest stumbling block to controlling private I&I is the municipal code, which isn't clear on where municipal ownership of the lateral ends and private ownership begins. "I believe we need to strike some sort of balance here," says Quesenbery. "For a member of a middle-income family, it's not easy to be told you have to do something and it's suddenly going to cost you this much. However, we do need to settle the question at the municipal level."

A proposal that may allow the



Josh Quesenbery performs a smoke test using equipment from Cherne Industries.

department to inspect the drainage systems of private homes is under study. The GIS mapping was completed in 2010, and it provided the ammunition for the department to make a pitch to city council for further repair and rehabilitation efforts.

In-house grouting

The study also determined that an in-house grouting program would be best for combating city infrastructure I&I cost-effectively. Quesenbery and Lapinsky used that recommendation to request the funds to purchase grouting equipment. With council approval, the department has just started work on a manhole remediation program using Avanti liquid acrylic sealers applied with an Avanti variable-ratio pump.

"By doing it in-house we can save money astronomically over contracting out," says Quesenbery. "Avanti came out and trained us to handle the product, and we've just started tackling the problem. Once we paid for the equipment, we were sealing for about half the unit price compared to contracting."

While the department is fully capable of dig-and-replace operations for pipe sections of up to 100 feet, crew members are now training in the use of Link-Pipe trenchless technology, which employs internally applied prefabricated stainless steel sleeves. The target proving ground is the system's leakiest hydraulic basin.

"We have a high degree of confidence that this will work for us," says Quesenbery. "We've got 20 sleeves waiting here in our storehouse. With this technology, we'll take the city from old school right up to speed."

The department is also tendering its first cured-in-place pipe lining contract, a section about 950 feet long. With exceptional progress in stabilizing the system, the department has established a plan to perform a complete cleaning of the system every five years and a camera inspection every 10, contingent on availability of funds.

"We needed a lot of good tools to do all of the jobs we've taken on in-house, and they're all steps in the right direction," says Lapinsky. "Thanks to the response of the mayor, city council and Aberdeen citizens, we've made giant leaps, and we're a lot further ahead than a lot of communities in regaining all of the capacity we once had." •



A team member operates the inspection camera from RS Technical Services.

MORE INFO:

Avanti International 800/877-2570 www.avantigrout.com (See ad page 50)

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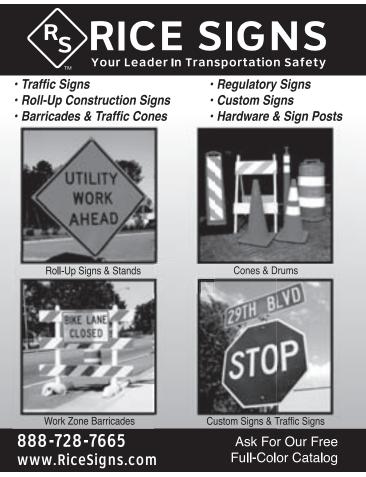
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FOCUS: SEWER

EVERY DAY, ALL HOURS

Dealing with 1&I 24/7 requires vigilant monitoring and rehab. The team in Miami-Dade County has reduced system 1&I by 30 mgd.

By Dan Heim

n most places, I&I is a seasonal problem or is driven by rain events. For the Miami-Dade (Fla.) Water and Sewer Department, it's a continuous issue.

The county lies on the southeast tip of the Florida peninsula. Part of the perimeter is at sea level, the maximum elevation is 50 feet, and the average elevation is about 12 feet. So the county needs a lot of pump stations — 1,039 in all.

The water table averages four feet deep, and 80 percent of the sewer mains are under water. So are some of the laterals. That presents significant I&I challenges. Rod Lovett, chief of the Wastewater Collection and Transmission Division, sums it up concisely: "We have to deal with I&I 365 days a year. It's a never-ending battle."

But it's a battle that's being won: "We've reduced our average daily flow, which is currently north of 300

mgd, by at least 30 mgd through our I&I program, and that's a trend we expect to continue." The department had been under a consent decree to reduce I&I. The team met that decree back in 2001.

Tools of the trade

Key to the department's success in fighting I&I is a grouting program started in the early 1990s. "We're probably one of the major grout users in the United States, and we've been very successful with it," Lovett says. "I've always felt that grouting is as much art as science, and some of our crew have become very good at what they do.

"When you have leaks, you get small voids outside the pipe. The grout gets pumped in, and it flows out through those leaks, fills the voids, and seals the pipe from the outside. The grout mixes with the sand around the pipe and forms a structural matrix stronger than The Miami-Dade Water and Sewer crew includes, front row, from left, Mayco Gonzalez, TV technician 2; Manuel Vigil, semiskilled laborer; and Javier Pantin, sewer collection systems supervisor; back row, Vicente Vergara, TV technician I; and Guido Nabut, maintenance repairman. (Photography by Javier Prado)

"We've reduced our average daily flow, which is currently north of 300 mgd, by at least 30 mgd through our I&I program, and that's a trend we expect to continue."

Rod Lovett

the grout by itself. Some of these repairs are 15 years old and still holding."

The department fields four trucks for grout work. Made by CUES, they are combination TV and grouting rigs equipped to



SERVICE AREA: 344 square miles

CUSTOMERS: 370,000 plus 12 municipalities and 1,000 private systems

INFRASTRUCTURE: 210 miles of force main; 3,070 miles of gravity sewers; 1,039 pump stations; 74,000 manholes

EMPLOYEES:
217 (wastewater collection and transmission)

ANNUAL BUDGET: \$17 million operation, \$21 million capital

AVERAGE RAINFALL: 58 inches per year

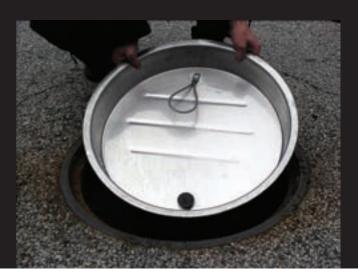
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The Miami-Dade Water and Sewer Department facilities leadership team includes, from left, Juan Bedoya, North Unit inspection supervisor; Rod Lovett, chief of the Wastewater Collection and Transmission Division; Bobby McEwen, South Unit inspection supervisor; Elaine Dennard, administrative officer; and Ini Roberts, engineer for review and evaluation of inspection data.

easier and more effective, and helping to launch the county's Suspect Lateral Program. When conducting mainline inspections, technicians stop at every lateral and pan and tilt for a look inside. If they see water flowing, they watch for at least three minutes. If the flow continues, that lateral is flagged as "suspect" and is scheduled for a follow-up inspection and rehabilitation as needed.

Laterals and manholes

Inspecting and maintaining

DIVIDE AND CONQUER

The Miami-Dade Water and Sewer Department is headquartered in Coral Gables, near the south central part of the county. For service and response, the staff has split the county into north and south sections with three strategically located operations centers.

Miami-Dade is the most populous county in Florida, with 2.5 million residents, or 1,158 per square mile. Traffic is heavy and often slow. In an emergency, getting a crew to where it's needed could take too long to help those affected. Bobby McEwen, South Unit inspection supervisor, notes, "I've been in traffic where it took me three hours to get from one end of the county to the other."

The department recognized and dealt with that challenge. Says McEwen, "We just split the county into North and South Units. It was a matter of logistics. But we still find ourselves working hand-in-hand on many projects.

"With three strategically located maintenance and repair locations, we've been able to reduce our response time to acceptable levels. We're not as spread out as, say, the fire department, but for an emergency, we want to get there in less than an hour. We track those response times, and know we could never operate out of a single location."

McEwen and his colleague Juan Bedoya, North Unit inspection supervisor, are responsible for sanitary sewer evaluation surveys in their areas. That includes camera inspections, manhole inspections and smoke tests. When they find problems, it's up to them to initiate the needed rehabilitation, coordinating with other utilities to ensure the least disruption and inconvenience to residents and businesses.

Ini Roberts, engineer for review and evaluation of inspection data, adds, "We also have access to a network of contractors throughout the county. That helps keep our response time low, whether for scheduled inspections, manhole rehab or line breaks."



Guido Nabut, left, watches as Mayco Gonzalez operates the CUES OZII pan-and-tilt camera unit from CUES.

deliver Avanti AV-118 chemical grout. A contract was awarded in February 2011 to build nine more of those rigs, and delivery was expected by the end of the year.

Grout isn't the only weapon against I&I. In 2006-2007, the department completed one of the largest lateral lining projects in the country at a cost of \$5 million, inspecting and testing 12,000 laterals, replacing 3,500, and lining 1,200, about 75 percent using the Perma-Liner system.

Miami-Dade began using CUES pan-and-tilt cameras in the mid-1990s, making lateral inspection

more than 2,200 miles of 4- to 12-inch laterals would be enough of a task on its own. As it happens, those laterals are among the weak points in the system and a constant contributor to I&I.

"Wherever you have Ys and Ts connecting, you end up having more stress due to differential loading," Lovett says. "The problem comes from sections that settle by different amounts. Where large pipes meet small pipes, that

(continued)



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"We do have an active
FOG program here, and
there's a county grease
trap ordinance, but I
have to say I wish we had
better compliance."

Rod Lovett



Vicente Vergara mixes the Avanti AV-118 grout in preparation for a rehabilitation project.

often happens. And when that pipe is clay, you often get cracks."

That's not good news, especially since 75 percent of the collection system is clay pipe, and 30 percent of it is more than 50 years old, some dating back to the 1940s. The department is now transitioning to C-900 PVC, which is less susceptible to cracking under stress and far easier to work with.

The department is also responsible for 74,000 manholes. Hydrogen sulfide, in concentrations up to 300 ppm in some areas of the interceptors, attacks those structures. Concrete corrosion is a continuing issue with older manholes as well.

Grouting, while used mainly for laterals and joints, has also been effective on leaky manholes. "We often have to drill through the manhole from inside, and then pump the grout to the outside to seal that leak," says Juan Bedoya, North Unit inspection supervisor. "Only after we stop the infiltration can we apply an inner sealant."

CPP from Epoxytec is the filler of choice, used to restore corroded manholes to their original contour. Here again, AV-118 grout is used as the sealant, and Uroflex (Epoxytec) for a corrosion-resistant coating. "We have other approved fillers and sealants, but some are proprietary and require specialized equipment," says Lovett. "Epoxytec does not."

Daily grind

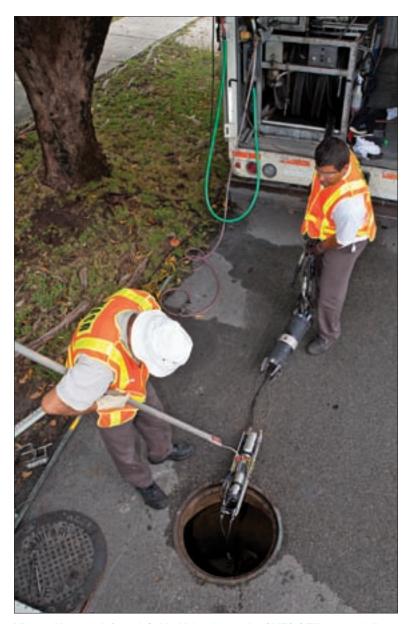
The department fields an impressive array of equipment to meet its I&I challenges. The fleet includes 28 combination cleaning trucks, 15 from Vactor Mfg. and 13 from Vac-Con, all with high-velocity jetting units and positive displacement vacuum blowers. Also deployed are 14 inspection vans using CUES camera equipment, four trailermounted jetters from Harben, and a large complement of dump trucks, sidelifts, crew cabs, backhoes, excavators, and front-end loaders.

Crews tackle all the usual tasks in stride — inspection, jetting, trap cleanout, excavation, dye and smoke tests and more. Much of the routine work is done in-house, but for some processes, like Perma-Liner lateral lining, the county calls on manufacturer-certified contractors. "For dig-and-replace repairs, we handle about 65 percent of that," says Lovett. "For the manholes, we do it all."

Twenty-five percent of customers are commercial, and since many of those are food service, FOG presents another hurdle. "We do have an active FOG program here, and there's a county grease trap ordinance, but I have to say I wish we had better compliance," Lovett says. "And that ordinance doesn't apply to private residences, which we find in some areas contribute to the FOG problem."

Infrastructure issues

Much of the lateral infrastructure is older clay pipe, although there is some cast iron. Mains are generally concrete. Although lat-



Vicente Vergara, left, and Guido Nabut lower the CUES OZII pan-and-tilt camera into the manhole. A tube containing the Avanti grout is connected to the camera.

erals are generally above the water table, that's not true of the mains. The soil on the seaward side is sand with a species of limestone called Miami onlite mixed in.

Administrative officer Elaine Dennard explains, "That's short for oolitic limestone, and it's found all around Florida. It's a very porous rock." The upside to Miami oolite is that, unlike sand, it doesn't need to be shored when trenching and generally can be excavated using just a backhoe.

Any pipes under water are subject to buoyant forces that cause structural stress and complicate repair work. "Small-diameter pipes don't have buoyancy problems, but when you get into the larger diam-

eters, it can create problems," says Lovett.

Further testing the infrastructure is average annual rainfall of 58 inches. Two-year storm events can dump 4.5 inches in 24 hours, and the occasional hurricane sweeps through. Hurricane Katrina sideswiped Florida on its way to New Orleans in 2005, creating what Lovett estimates was a 75- to 80-year storm event. All this means I&I will be a continuing challenge.

Proactive inspection

The department runs an extensive sensor system using hydrograph monitoring. On the mains, laterals, and at pump station basins,

flow is carefully monitored after rain events. The flowmeters are ADS FlowShark units, and the data they provide is run through a SCADA system to generate the hydrographs. Changes in flow are an important clue for where to focus resources.

Comparison of rain event flow rates before and after rehabilitation is also important. Best done after a two-year event, this measurement is crucial. "We always check the hydrographs before and after a repair," says Lovett. "That's how you find out if you did your job."

In addition, there's the Well Field Protection Ordinance, which requires the department to inspect and repair all lines in well field cones of influence. Inspections are mandated on a five-year cycle. With all potable water for the area supplied by wells, it's essential to avoid contamination of the aquifer. Wells are located on the higher west end of the county, tapping the Biscayne Aquifer at a depth of 65 feet.

"Our customers only know about us if their sewer doesn't work, and they have little sense of what it takes to keep that from happening. It's an unfortunate thing, but the more reliable we are, the less appreciation we get."

Rod Lovett

Plans for the future

The recent economic downturn affected budgets in all sectors. Staffing levels have fallen 32 percent over the last 14 years. The Miami-Dade staff believes a force main inspection program is essential to proactive rehabilitation, but funding it is difficult. "Property and tax values have tumbled," says Lovett. "We don't operate on tax revenue, we operate on water and sewer revenues. But as a department, we're still affected.

"If we had more mains failing, we'd probably get all the funding we need. And that's the ironic thing about this business — if you're doing your job right, people think there are no problems. The way I see it, we just have to do the best we can with what we've got. Our customers only know about us if their sewer doesn't work, and they have little sense of what it takes to keep that from happening. It's an unfortunate thing, but the more reliable we are, the less appreciation we get."

Bedoya adds, "We've got some really good people here, some of the best in the business, and we're lucky to have them."

Lovett concludes, "I really believe our I&I program is second to none. We have one of the most comprehensive and in-depth programs around. You've got to have a well-designed program for the area and conditions you've been dealt. Our program wouldn't work in, say, Atlanta. We've got the right program, and I believe our people do an outstanding job." And do it 365 days a year. •

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Harben, Inc. 800/327-5387 www.harben.com

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ON A SHOESTRING

Ingenuity helps an Arizona city achieve compliance with U.S. EPA stormwater regulations at low cost and with a soft touch

By Scottie Dayton

hase II of the Clean Water Act hit the small rural community of Sierra Vista, Ariz., squarely between the eyes. With no state or federal money to fund the stormwater management mandate, the city council told the Department of Community Development to figure out how to achieve compliance.

James Herrewig, director of Community Development, and Jenifer Thornton, management analyst, volunteered. "It was a huge learning curve because we aren't engineers, and we have to do everything as inexpensively as possible," Thornton says. "It came down to incorporating stormwater into our jobs."

The MS4 program approved by the council left Herrewig and Thornton struggling to comply with regulations geared not for desert washes or arroyos, but for major cities with storm sewers. Experience told them that with eight inches of annual rainfall, residents would never accept a stormwater fee. To persuade them and contractors to accept an ordinance diehards viewed as ludicrous, the pair focused on education delivered with a soft touch — and succeeded.

Today, Community Development still has no separate stormwater line item in its \$400,000 operations and maintenance budget, but the accomplishments of Herrewig and Thornton have attracted the attention of other small MS4 communities, asking how they did it with little or no money.

Capture and filter

Sierra Vista, 75 miles southeast of Tucson, lies at the base of the Huachuca Mountains to the west. The Mule and Dragoon Mountains are to the east. The San Pedro River runs through the

"It was a huge learning curve because we aren't engineers, and we have to do everything as inexpensively as possible. It came down to incorporating stormwater into our jobs."

Jenifer Thornton

valley and mainly underground.

The river, originating in Cananea, Mexico, flows south to north, supporting an important riparian habitat in the Upper San Pedro Watershed. During the monsoon



season from mid-June through mid-September, stormwater drains off the land in sheets and into centuries-old natural washes flowing west to east. The water never reaches the river, 10 miles outside the city limits.

The monsoons provide the only opportunity for the city to recharge its aquifer. Vegetation is allowed to grow in the washes to slow the flow; Public Works crews cut it once after the rains. From then on, the washes are dry.

Scientific studies revealed that the soil in washes increased absorption rates, so the city, the U.S. Army Corps of Engineers, and U.S. Army Fort Huachuca built retention ponds in them. Additional studies showed that detention basins captured and filtered runoff better.

Beginning in 2003, the ponds were replaced with basins: four large ones on the west side of the city where it abuts the Army base, and four built by the Corps of Engineers inside the base. The city owns six large detention basins within its 20 square miles. Subdivisions and commercial developments have a multitude of smaller basins.

PROFILE: Sierra Vista, Ariz., Department of Community Development

FOUNDED:

POPULATION:

SERVICE AREA:

EMPLOYEES:

ANNUAL RAINFALL:

8 inches

INFRASTRUCTURE: 4.5 miles of paved drainage ways, 22 miles of native drainage ways

OPERATING BUDGET: \$400,000

WEBSITE:

Walking the dry washes is a routine chore for Jim Herrewig and Jenifer Thornton. Here they check Soldier Creek, part of the many miles of dry washes, looking for potential problem areas to correct.

Building detention basins involves scooping out a depression in the wash, then constructing a check dam with a culvert downstream. During rainstorms, the culvert releases water more slowly than it comes in, causing the basin to fill as the deluge progresses. Alan Humphrey, senior civil engineer, balances release time with basin size and expense to design the most efficient regional facilities.

Walk the line

While the city welcomes the monsoons, they mean increased paperwork for Herrewig and Thornton as they double-check that contractors have prepared their sites to prevent the rains from washing away soil. Some storms, however, dump copious amounts of water in minutes, then stop. "No matter how contractors plan, they can't keep the soil on-site," says Thornton. "It just pours off, making even more paperwork."

Smaller, long-time contractors laughed when the pair told them that mud could no longer fall off their trucks as they left construction sites. "They couldn't see the logic of the mandate when that mud ran into muddy washes," says Herrewig.

The Southeastern Arizona Contractors Association (SACA) rode to the rescue, supporting the MS4 ordinance and telling the few resistant companies that they must comply. Thornton worked with the association to establish a training curriculum for installing silt fences, straw bale barriers, and other Best Management Practices. She hired Jay Knoll of the Environmental Planning Advisory Committee (EPAC) in Green Valley and Tracy Castell, president of Sonoran Enviro Tech in Tucson, to teach it.

"We held four basic education classes and one on advanced stormwater management," says Thornton. "The city provided \$15,000 and the classroom. SACA advertised the courses and filled the seats. We were fortunate that both



TOUGH ON GREASE

The Sierra Vista Public Works and the Water/Sewer Services Section stop fats, oils and grease at the source. Besides contaminating soil and stormwater, making the area's natural washes unsafe for people and wildlife, FOG upsets the microorganisms in the wastewater treatment

The city's 4 mgd water reclamation facility has four complete-mix lagoons and four partial-mix lagoons, the last two with clarifiers, on 10 acres. Effluent from the clarifiers flows into 10 wetland cells on 50 acres, then into 11 rapid infiltration recharge basins on 30 acres. The facility recharges up to 4,000-acre-feet of water annually.

"If FOG kills the bacteria, we have to drain and dredge the stricken lagoon," says Hector Hagele of Water/Sewer Services. "Beginning in 2002, we worked to develop a strong FOG management program. Our role is education. We visit the restaurants to teach Best Management Practices and leave fact sheets on ways to prevent pollution."

Hagele's work assists the MS4 program by ensuring that restaurants use grease traps and pump them regularly. He inspects them, measures the grease, and reminds owners how FOG obstructs sewers and can cause overflows that create health risks.

In 2009, the city implemented a Residential FOG Program and established three drop-off locations for citizens to bring grease in plastic containers. The grease is converted into biodiesel fuel.

entities believe in education and working with the contractors rather than alienating them through strong-armed tactics and fines."

Most contractors sympathized with Thornton and Herrewig, realizing that they were learning on a job nobody wanted. John Eyre, P.E., of the state Department of Environmental Quality, taught them how to inspect sites and answered questions. Eyre and Knoll worked with the only resistant contractor without penalizing him.

"It's remarkable how contractors assist each other to avoid infractions," says Thornton. "They'll drive past a site, see something wrong, and call each other or us. We evaluate the situation, then alert the contractor and work with them to fix the problem. Our enforcement is education and our results are positive."

Available resources

The city's education program included creating stormwater pollution prevention fact sheets for residents and contractors. Rather than reinvent the wheel, staff searched southwestern city and agency websites for information, focusing on Texas, New Mexico, Arizona, and southern California because their climates are similar and they have no underground stormwater infrastructure.

Following Best Management Practices, fact sheets for residents provided ways to keep home and yard pollution from reaching the washes. Since the city has no industry, the staff wrote fact sheets for carpet cleaners, auto mechanics, restaurant owners, and construction companies, focusing on the use of BMPs and MS4 reporting requirements.

The effort is paying off. For the most part, carpet cleaners no longer pour dirty water on streets, and pest-control contractors no longer dump leftover pesticides in washes. Nevertheless, the washes and state trust land within the city limits remain wildcat dumpsites for garbage and household goods. The practice is a problem because sheet flow drainage carries the trash directly to the washes and pollutes the water.

"When we find illegal trash, we cut open the bags and search



Michael Cerepanya, president of MGC Consulting, left, and Jim Herrewig inspect an installed waddle at The Retreat by Castle and Cooke, an active construction site.

"It's remarkable how contractors assist each other to avoid infractions. They'll drive past a site, see something wrong, and call each other or us. Our enforcement is education and our results are positive."

Jenifer Thornton

for names," says Herrewig. "Then we work with police to track down the perpetrators and make them clean it up." In one instance, Herrewig was in his snake boots walking down a wash in response to an illegal dump call when he smelled something awful. "I was praying that it wasn't human remains," he says. "The source was a fully loaded refrigerator. Public Works had to pull it out with heavy equipment."

The city established a hotline to report violations anonymously. It also created an Adopt-A-Wash program. "Activities like picking up trash and monitoring a small segment help volunteers develop stewardship and empower them to make a difference," says Thornton.

Clean water, please

Stewardship even extends to backyards, the only area where the city water conservation code allows grass. Development codes require stormwater to flow from the rear of lots to the front, enter the streets, and discharge to the wash.

Lots along washes may drain into them. These properties often have brick walls at the rear. Homeowners occasionally remove a brick to release ponding water from monsoons, or run a pipe (illegally) through the wall to drain swimming pools.

Herrewig walks the 26.5 miles of washes looking for these discharge points and others. When he talks to homeowners with swimming pools and weep holes, most are receptive to his cleanwater message.

"I don't ask them to plug the hole because it relieves water pressure against the wall, but I do stress the importance of not allowing pesticides and fertilizer to enter the wash," he says. "The owners often replace the brick or plant vegetation in that corner to slow the flow."

Herrewig initially marked the discharge points on an aerial map as part of the stormwater mandate. Now he uses a handheld GPS unit. "Our goal for 2011 is to enter all locations into our Encompass GIS mapping system from Geodesy," he says.

Herrewig and Thornton have tapped into the WaterWise program from the University of Arizona Cooperative Extension Cochise County for advice on using graywater, rainwater harvesting, rain gardens, water-efficient landscaping, and indoor and outdoor water conservation. Cochise County, Sierra Vista, and Fort Huachuca contribute money to the program.

State and county laws require graywater to remain on-site and not come in contact with the public. "It can't even drain down the street," says Thornton. "Those restrictions make it impossible for smaller lots to use it."

Regulation strangulation

The challenges of the past six years have stretched Herrewig's and Thornton's imagination and resources, but the U.S. EPA mandate to test stormwater for turbidity in 2012 may be asking too much of a community with only natural washes.

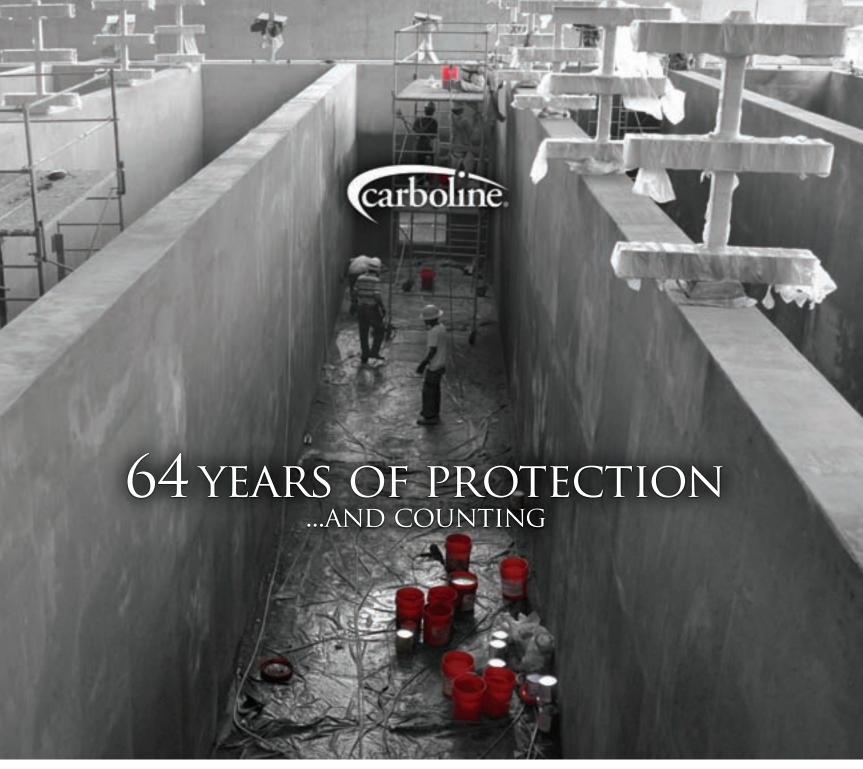
"Compliance will be hard because our runoff has a lot of turbidity," says Herrewig. "We can't afford to set up our own laboratory, and sending out samples is expensive. However, we've always found ways to do things inexpensively in the past, and hopefully we'll find a low-cost way to test the water."

Meanwhile, the two continue to educate homeowners and contractors. "Taxation and enforcement will never work in rural Arizona," says Thornton. "Education is the only route, and it is achieving the result anticipated for the program." ♦

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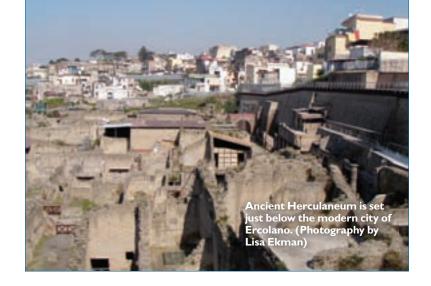
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LEARNING FROM THE **ANCIENTS**



Sewers under an ancient Italian city buried by the eruption of Mount Vesuvius reveal how the Romans handled wastewater and stormwater

By Lisa Ekman

n A.D. 79, Mount Vesuvius buried the Roman town of Herculaneum, and its sewer system, under 60 feet of debris. After a farmer rediscovered the ancient town 1,600 years later, archaeologists had their hands full studying mosaics, paintings and water features.

Recently they've turned their attention to the sewers. Their studies have brought insights into how Romans handled wastewater and stormwater, how they built, how they lived, and even what they ate.

Elaborate systems

Herculaneum lies five miles from modern Naples in the south of Italy. Two thousand years ago, it was a seaside town of 4,000 with elaborate wastewater and stormwater systems. Households collected



rainwater to store in cisterns, disposing of what was left over both on the sloping streets and in the sewers below them.

Rainwater was not residents' only concern: They also had to dispose of wastewater from the public bath complex, the town pool, and public and private restrooms.

We might not know much about the sewers of Herculaneum if archaeologists hadn't been forced to rethink the way rainfall drains from the site. When the city was occupied 2,000 years ago, rainwater had somewhere to go: the city's system sloughed it off. When archaeologists excavated the site, though, they opened up the fragile houses, with all their paintings and mosaics, but didn't open up the sewers that had formerly drained water from them.

An archaeological near-disaster ensued. Unmanaged rainwater caused dampness and mold, which began to destroy the ancient treasures. As a solution, the Herculaneum Conservation Project decided to open up the old sewers for modern use. In the process, archaeologists have learned about how Herculaneum's ancient population dealt with stormwater and wastewater.

Exploring the workings

It's hard to say exactly how the system worked — archaeologists are constantly learning more but here is an outline.

Many residents of Herculaneum had private toilets. To flush a toilet, they would pour water down sloping tiles that led toward a hole, cleaning the toilet surface while moving the waste along. If they were lucky enough to have a toilet in the upstairs, they needed very little water, because the waste would make a vertical drop down a terra cotta pipe.

After the waste left the house, it flowed toward a sewer under the sidewalk or street. The sewer carrying that toilet waste could be as large as 6 feet wide and 12 feet tall. The sewers had relatively straight walls and vaulted ceilings built from volcanic tuff. The floors were made of cement. At the junctions between sewers, corners were rounded to improve the flow of water and reduce its pressure.

Depending on where people lived, the toilet waste might mingle with stormwater and bathwater before plummeting down a shaft to flow toward the sea. Or it might flow into a giant septic tank that had to be emptied every so often. Archaeologists think the contents of this tank might have been used to fertilize surrounding fields.

What we can learn

Besides creative design, what do the ancient sewers teach us? We learn about daily life from the objects residents dropped into the sewers — everything from coins



The town's largest sewer runs beneath this street.

to pots. The sewers also demonstrate Roman building techniques: In some, it's still possible to see impressions of the wooden forms used to build the vaulted ceilings.

And, of course, ancient feces have revealed details about diet and health. Archaeologists think residents of ancient Herculaneum ate (among other things) figs, fish, eggs, bread, chicken and olives.

Panoramic photos of the sewers can be seen at www.proximaveritati.auckland.ac.nz/Herculan eum/Sistema_fognario/index.html.

The Herculaneum Conservation Project (www.herculaneum. org/hcp-home/#) is the group responsible for most of the sewer work. Supervising archaeologist Domenico Camardo has worked extensively with the sewers. +





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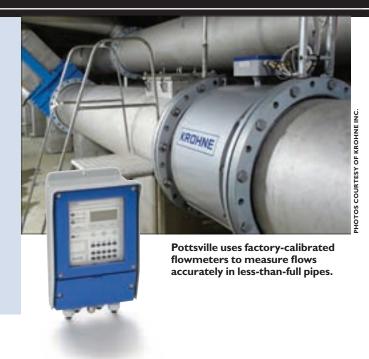
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OVERFLOW SOLUTION

Partially filled magmeters give a Pennsylvania city an effective remedy against high wet-weather flows that had overwhelmed the treatment plant

By Richard Lowrie

"The city had a combined system.
In order to have such a system, you must have control structures that basically separate sanitary flow from a predesignated amount of flow."

Bruce Hulshizer

he city of Pottsville in Schuylkill County, Pa., faced a serious problem with wastewater overflows, caused in part by the design of its 1800s-era masonry sewers.

For many years, raw sewage transported by the 4-foot pipes emptied straight into a creek. In the 1970s, the city installed an interceptor to collect a portion of the flow and send it to the recently built wastewater treatment plant.

Although that remedied some of the problem, the combined sanitary/storm sewer system had a flaw. After a large rainstorm, the interceptor would overwhelm the treat-

ment plant with stormwater, and the plant would flood, sending untreated or partially treated water into streams. That led to fines from the state regulatory agency and negative impacts on the environment.

The key to a solution would be to regulate the initial flow of water into the interceptor system. The city found the answer in partially filled magmeters that measure flows and enable the staff to determine when to divert water away from the treatment plant during rain events.

Measuring flows

To design a viable solution,

the city turned to the Buchart-Horn engineering and architectural firm in York, Pa. The firm began by updating the city's 537 Plan, required under the Pennsylvania Sewage Facilities Act, enacted in 1966

"The 537 Plan is approved by the Pennsylvania Department of Environmental Protection," says Bruce Hulshizer, a senior engineer with Buchart-Horn and a project manager for sewer and water projects. "That's basically saying 'This is what we're going to do for our sewer needs.' Apparently, the DEP wasn't satisfied with the way things were going, and the city wasn't going to meet the consent order, so the city staff pulled us in."

As part of the solution, Buchart-Horn brought in KROHNE, which offers measurement instrumentation for wastewater treatment and process industries. The company recommended partially filled electromagnetic flowmeters (magmeters).

By using these magmeters, the city can measure the normal dry-weather flows that would not keep a typical magmeter filled, as well as the higher wet-weather flows. Using the flow data, the city could divert wet-weather stormwater flows away from the treatment plant and directly into waterways, preventing plant overload.

Flows above a preset rate are assumed to consist mainly of relatively clean stormwater runoff that can be safely discharged to the environment. When normal flow rates resume, the flow is directed back to the treatment plant.

Repeatable results

"The city had a combined system," says Hulshizer. "In order to have such a system, you must have control structures that basically separate sanitary flow from a predesignated amount of flow. Above that level, it would be storm flow, so you'd have to have some way of dividing the two. That's where the partially filled magmeters came in."

The electromagnetic flowmeters contain electronics designed to provide reliable and repeatable results, even under difficult conditions. The units are wet-calibrated by direct comparison of volumes, the most accurate calibration method, to achieve accuracy to ± 0.2 percent of actual value.

For the Pottsville project, Buchart-Horn chose 21 TIDAL-FLUX electromagnetic magmeters, combined with a capacitive flowlevel measuring system built into the wall of the measuring tube. This provides accurate flow measurements in pipelines filled to levels from 10 to 100 percent of the pipe cross-section.

The flowmeters are factory calibrated to ensure high accuracy in partially filled pipelines. They are designed with abrasion and chemical resistance to achieve steady display of measured values regardless of rough surfaces and distorted flow profiles.

Impacts reduced

The city benefitted from KROHNE's installation base for use as a reference for the perfor-

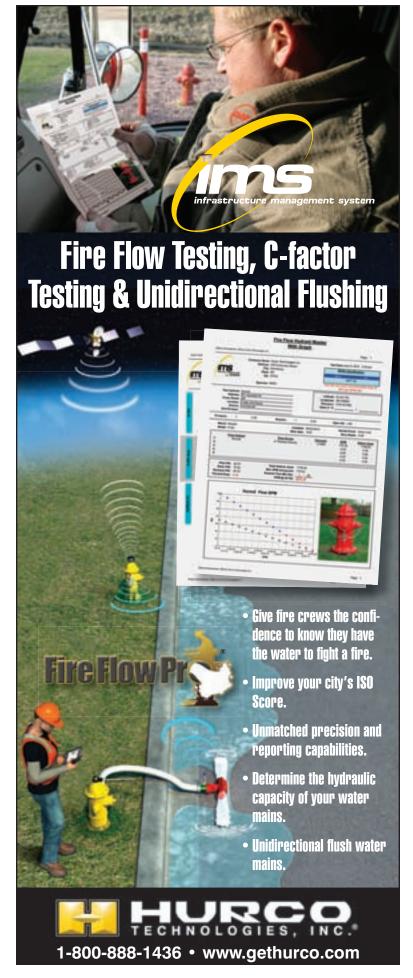


The city of Pottsville in Schuylkill County, Pa., faced a serious problem with wastewater overflows, caused in part by the design of its 1800s-era masonry sewers.

mance of partially filled magmeters. In the end, the load on the wastewater treatment plant was substantially reduced in high-water events, allowing the plant to operate within its specified ranges. The impacts of untreated or undertreated wastewater discharges were also reduced.

"It's been a long process to where the city has come in terms of its wastewater treatment, but it has been a very effective solution," said Hulshizer.

Richard Lowrie is water and wastewater industry manager with KROHNE, a developer, manufacturer, and distributor of measuring instruments for the wastewater and process industries. •







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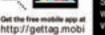
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CRAWL BEFORE WALKING

Smaller communities should take a gradual, methodical approach to deploying GIS technology in water distribution systems

By Jason Britton

hen I began my career as the "map guy" at the Madison County (Ala.) Water Department six years ago, I encountered a water main location program that may seem familiar.

It usually began with a question of what size water main was on a certain street, followed by someone saying, "Call Tom. He worked on that main about three years ago. He should know what's there."

In my experience, a lack of accurate mapping is a widespread problem in water distribution systems. While there is nothing wrong with relying on an experienced worker, two things must be kept in mind: It's not the most efficient way to keep records, and the workers who know the system like the back of their hand aren't going to be around forever. This is where geographic information systems (GIS) come in.

Communities and utilities of all sizes are adopting GIS, some with more success than others. For smaller communities especially, deploying GIS cost-effectively takes a careful process, from choosing the right software, to inputting assets to the system, to deploying the technology for field crews, to training users to take full advantage of the tools.

More than a map

The experience of Madison County Water provides lessons for other utilities exploring the potential of GIS. The department provides water service to about 28,000 customers in the unincorporated areas of the county. The customer base has been steadily increasing for several years at an average rate of about 3 percent.

The staff of 58 employees includes 26 state-certified water treatment operators. The infrastructure includes 950 miles of



A water tank is identified in the GIS, with maintenance data and embedded digital photo.



Valve attributes are displayed on a GIS map.

water mains in service and 11 water storage tanks with a total capacity of 16 million gallons.

When most people hear the term GIS, they immediately think of a map. While GIS is in fact a map-based system, it is much more than that. GIS is a way to organize, visualize, and interpret specific information about a physical location in a convenient and user-friendly way.

If a GIS is used to create a map, but includes no information about the physical objects displayed on the map, it is no different from a paper map you may have hanging around the office. The information the GIS contains is what makes it truly beneficial.

There are many ways to create a GIS. Not surprisingly, cost is at the forefront of GIS selection, as in any decision related to water distribution systems. When you decide to purchase GIS software, you will be visited by the vendor's best pitchmen, who will throw a lot of bells and whistles at you.

One mistake many organizations make in implementing GIS is overbuying software. A few months ago, I sat in a GIS vendor presentation for a department in my county. After the presentation, the vendor suggested purchasing \$25,000 worth of software to get started. Later, in looking over the department's needs, we found that they could start a GIS for \$6,500. Another department in our county is acquiring GIS software for \$1,500.

A good rule is to start with the basics and minimize the initial investment. Acquire GIS software that will help you get information about your system organized and available for use internally. Consider upgrading from the basic software package once you've had time to evaluate the setup and how you would like to move forward. You should also purchase a GPS receiver if you need to collect physical locations of water infrastructure to include in your GIS.

Implementing a GIS

After acquiring the software,

your people need to learn to use it efficiently. Software vendors have convenient training packages available for purchase. If you are too far away to travel for training, some vendors even offer virtual classrooms with live instructors. You can take part in these classes from your own office.

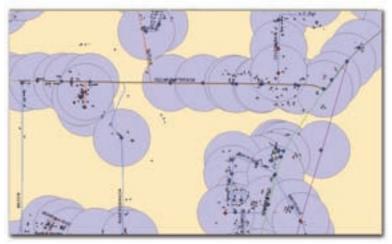
If you don't feel like training yourself or someone else, then hire a GIS professional. Many colleges now offer GIS degree programs, and undoubtedly there's an eager graduate out there who would be happy to help get your GIS up and running.

Once your training is complete, you need to set up your base map. Most GIS software comes with free base map data that includes national, state and county boundaries as well as transportation features, such as roads and interstates. If it is not included with the software, free data is plentiful on the Internet at sites like www.geocomm.com. Check with other government organizations in your area as well. We were able to acquire parcel and owner information from our county tax assessor.

Now the real work begins. Here's some advice: start big, end small. Gather information on tanks, master meters, booster pumps and sources first. Include information like the capacity and height of tanks, pumping capacities for pumps and sources, and sizes of master meters.

Next, move to collecting information about water mains. Include information like main size, material type, and side of the road. After the mains have been identified, collect the locations of fire hydrants. (Before you start collecting hydrants in the field, check with your county's Emergency Management Agency office. They may have already collected this information.)

Next, collect information on valves. Include information like size, type and distance from the road centerline. In cases where valves may connect to another distribution system, it is also helpful to note whether they are turned on or off. Finally, add information about your customers. Locate each meter and include its services and serial number for the



A GIS map shows a 1,500-foot buffer around each hydrant, and structures within the buffer are shown.

One mistake many organizations make in implementing GIS is overbuying software.

A good rule is to start with the basics and minimize the initial investment. Consider upgrading from the basic software package once you've had time to evaluate the setup and how you would like to move forward.

meter. You probably have this information available, and all you need to do is transfer it over to the GIS.

Another good idea for GIS in water distribution systems is to include maintenance information on the tanks, pumps, mains and valves. This will allow you to determine when these items were last serviced or repaired and will help you develop and maintain a preventive maintenance schedule to keep things running as efficiently as possible.

Benefits in the field

There are a few ways to deploy GIS in the field. The most basic is to simply print off maps in the office before crews report to the work site. That will give them a general idea of what they will encounter while working that day.

The second is to deploy the GIS software on laptop computers for the crews to take with them. At Madison County, we purchased an add-on that allows us to put an interactive map on as many laptop computers as we want. We then installed free reader software on the laptops to make the field map usable.

The good thing about the reader software is that while the crews can view and gather information from the map, they can't make any changes and run the risk of introducing errors. Fully operational field software is also available so that crews can make on-the-fly changes as they happen, but this requires additional training for users and added cost for software.

One of the toughest parts of implementing GIS is getting the field crews to buy into the idea that the GIS can help make their jobs easier. A few months back, one of our crews spent half a day potholing, trying to locate a water main that had no tracer wire on it.

The general foreman asked if they had used the GIS to help them. They hadn't, and when we checked the GIS, it showed the mapped water main location was within a foot from where the main actually was. Sometimes it takes situations like that to prove to the field crew that GIS is actually a tool that will help them. This example also illustrates how a GIS can improve efficiency in the field.

Water system analysis

Even in a basic form, GIS can be used as a powerful analysis tool for water distribution systems. In our county, the commission has made it a goal to make sure all occupied structures are within 1,500 feet of a fire hydrant. It could be quite time-consuming to gather this information in the field.

However, with the GIS in place, we performed a 1,500-foot buffer of each fire hydrant. The GIS added a 1,500-foot radius around each fire hydrant when the process was complete. We identified customers who were outside of the buffer zones and were able to devise a hydrant installation program that would meet the commission's goal.

In leak analysis, we used our existing work order database to isolate all main repairs performed over the past 10 years. Using the repair address, we performed a simple geocode (a process of adding addresses from a database to the map) and created a point feature file of all of the leaks. Once the leak information was displayed we identified concentrated areas of leaks where it would be more efficient to install a new main than to continue doing repairs.

Seeing the benefits

Once the GIS is running at a basic level, you will begin to notice the benefit. Since the sizes and types of mains are available at the click of a mouse, crews can leave the warehouse knowing exactly what materials they need for repairs or upgrades.

Instead of looking for valves during main breaks, field personnel will know exactly where to go to get the water shut off in a shorter time. Accurate information will help you make decisions about your rural water system more easily, make repairs more efficiently, and reduce water loss during repairs. •

About the Author

Jason Britton is GIS and contract coordinator for the Madison County (Ala.) Water Department. He holds a degree in professional geography from the University of North Alabama and is a certified Alabama Department of Environmental Management Grade II water operator and Level I tank coatings inspector. He can be reached at jbritton@co. madison.al.us.

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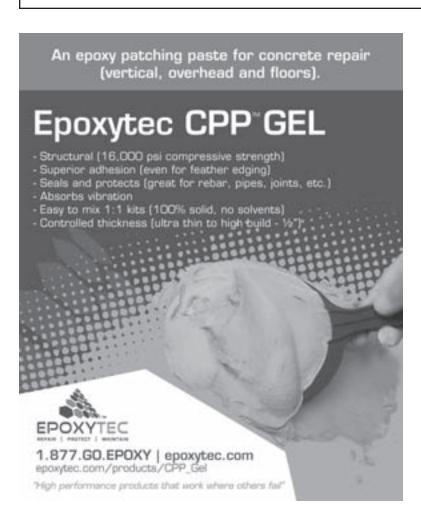
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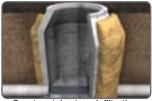
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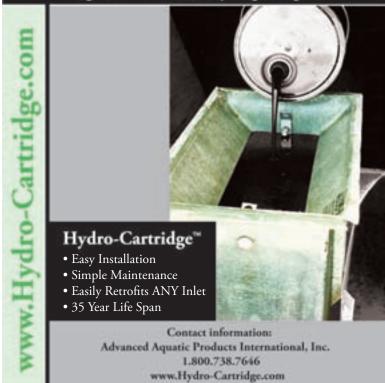


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COMPLETE **PACKAGE**

Infrastructure Management System (IMS) from Hurco Technologies is designed to simplify comprehensive testing and tracking of water infrastructure

By Doug Day

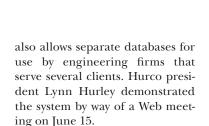
egulatory pressure and budget constraints are just two factors raising attention paid to managing information about water distribution systems. The challenge is to track assets, conduct testing, monitor results, schedule maintenance, and handle other tasks as efficiently and seamlessly as possible.

The Infrastructure Management System (IMS) from Hurco Technologies is designed to fulfill those needs. It includes a version for a desktop computer in the office to manage the data, and a mobile version for use on laptops and

handheld devices in the field to capture data about assets including fire hydrants, valves and mains and can be used in conjunction with other Hurco Technologies offerings:

- Fire Flow Pro software and equipment for testing hydrants and mains
- Spin Doctor portable valve and hydrant testing with ValveSTAR

IMS was designed for communities, especially small cities that need a comprehensive data management tool. Cities can purchase or rent the equipment or hire Hurco to conduct the testing. It



Walk-around

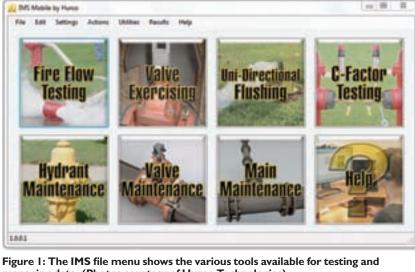
The IMS system is designed for testing four key parameters of a water distribution system (Figure 1):

- Fire flow capabilities of hydrants
- Valve exercising in water
- Unidirectional flushing
- C-factor testing

Hurco offers computers designed specifically to handle the large amount of data in the IMS system, though the program works with any Microsoft Windows-based PC or laptop, and with handheld devices such as a Trimble Yuma or Panasonic Toughbook (except those powered by Windows Mobile).

A USB radio frequency transmitter/receiver is included for capturing data wirelessly from Hurco pressure sensors. It receives information from up to a few thousand feet away as long as the

Figure 2: IMS Mobile includes a touch screen keyboard for easy data entry on handheld devices.



managing data. (Photos courtesy of Hurco Technologies)

sensors are within line-of-sight of the receiver.

The sensors can also serve as repeaters. "One sensor will talk to another and relay data back to the laptop," says Hurley. That means it is possible to set up testing equipment around the corner from the laptop location and still receive the data.

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OFFERED BY:

Hurco Technologies, Inc. 800/888-1436 www.hurcotech.com

Via Internet

Lynn Hurley, president

\$4,000 as demonstrated (up to nearly \$13,000 for IMS, IMS Mobile, and wireless testing sensors)



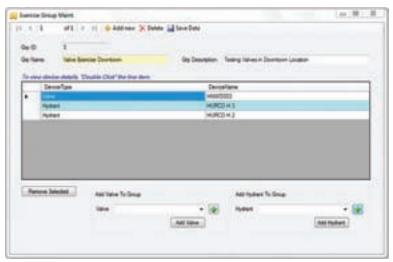


Figure 3: Green cross buttons indicate a dropdown box with pre-entered data. For this test setup page, clicking the button allows users to select from the complete inventory of valves or hydrants.



Figure 4: Test results are automatically combined into a detailed report and stored in the IMS for future reference.

Operation

As with any database, most of the work with IMS is in the setup. Users enter information about each main, valve and hydrant, including manufacturer and model numbers where applicable. As users navigate through each setup page, some fields include dropdown boxes with pre-entered information, such as common manufacturer names. Users can customize these boxes so that they always include information spe-

cific to the locality.

The setup data is usually entered in the desktop version but can be entered in the field with the IMS Mobile touch screen keyboard, then uploaded to IMS. (Figure 2)

In the demonstration, a single click brought up the setup page for a hydrant, main, or valve, and the steps for setup were similar in each case. For a hydrant, for example, Hurley entered a name and an ID number, along with the

installation date. If entering the data in IMS Mobile on location, a single click adds the GPS coordinates. Users can also manually enter coordinates using GPS or UTM, another form of GIS mapping.

The setup page contained several fields to enter the manufacturer, model number, paint color, and other details, including a picture. Hurley continued the setup process by adding location information, including an address and names of nearby cross streets.

Water mains are treated differently from hydrants and valves. "The system defines a main as what is buried underground between two fire hydrants," said Hurley. That approach is consistent with the testing recommendations of the American Water Works Association.

Hurley showed how to set up a main, completing fields for name, ID numbers, pipe length and material, and the sizes and types of connections, such as mechanical joints or slip fittings. "The reason that's important is for C-factor testing," Hurley said. "An 8-inch T-connection just two-anda-half feet long can add the same resistance to the main as 33 feet of pipe."

Once finished with the setup, the user has a complete inventory of all assets. Hurley showed how clicking on a hydrant brought up all the information entered about it, including a picture, past test results, maintenance records, and a map of the location.

"We understand that small cities simply can't afford an expensive GIS mapping system," Hurley noted. "With an Internet connection, this is a free feature compliments of Google Earth. Small towns can do what the big cities do and do it very affordably."

Setting up a test also took just a few clicks. Though users have to set up a separate test for each asset to be tested, that only must be done once, since all tests are saved. Tests can be set up in the desktop or mobile versions of the program.

Hurley showed how to select from a dropdown box to set up fire flow testing, valve exercising, C-factor testing, and unidirectional flushing. On the fire flow setup page, he named the test, and then entered the hydrant being tested along with the hydrant being flowed and the testing device (2-inch nozzle). That told the software how to calculate the test results. Users can also select a series of hydrants, as long as they are adjacent to each other. (Figure 3)

"IMS and IMS Mobile are designed to provide everything needed to manage, test and repair a water distribution system."

Lynn Hurley

Hurley noted that the fire flow testing section conforms to standards of the National Fire Protection Association and grades hydrant capabilities based on NFPA colorcoded standards (red, orange, green, blue). (Figure 4)

"Once you have entered all the assets and created the tests, the next step is to create work orders for the tests," said Hurley. "Since testing is done every year or two, you make them recurring work orders. Each work order automatically appears in the pending work order list 30 days before it's due."

Testing is no different than normal, unless Hurco test sensors are used. For instance, for a fire flow test, a technician starts by installing a test cap. The test sensor is placed on the cap, and the valve and hydrant are opened to bleed off the air. Once that is done, the valve is closed and the hydrant is fully opened.

The Fire Flow Pro handheld is then connected to the laptop and the test is activated. "The first thing you'll see is the current pressure in the main," Hurley noted. "It directs you to open the next hydrant or hydrants. The handheld unit will immediately display and capture the percent of drop from static to residual, and the system saves the test data."

Operation of the optional ValveSTAR is similar to Fire Flow Pro, automatically recording test data to the IMS Mobile if using the Spin Doctor valve exercising equipment with the wireless sensors. Hurley showed how to manually record test data and enter it in the field into IMS Mobile.

Hurley also showed the setup for C-factor testing mains, indicating the main to be tested, the hydrants to be used, and the isolation valves to be used. "Over time, water mains start to get plugged up," said Hurley. "We can test the coefficient of a main between two fire hydrants and tell you how much water is flowing through it."

Back at the office, Hurley explained, the laptop is synced to the IMS system through a docking

station, and all the data and test results are automatically transferred. "If you find a deficiency in the field, such as a hydrant missing a cap, you just enter it in the field and it shows up in the report," Hurley said. "From there, you can create a work order that automatically is entered into the system."

When entering IMS, the main page displays a list of active work orders, those that are pending and recently completed, and a list of equipment deficiencies that have been reported but for which work orders have not been created. (Figure 5)

Observer comments

The IMS appeared user-friendly and comprehensive in the data it stores and manages. The system appears to include a field for almost any information about an asset that a user would need to look up. The software appears to

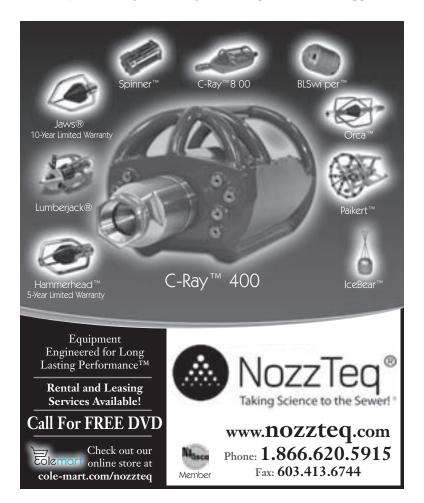




Figure 5: The main screen of IMS shows a list of active, pending, and recently completed work orders, along with deficiencies that have not been scheduled for repair.



Figure 6: Along with complete details, IMS will show a map of the location of each asset, and a single click will provide driving directions from Google Maps.

deliver ample power at a cost affordable for most small water communities or water utilities, and has potential to save money by streamlining testing procedures and record keeping.

Manufacturer comments

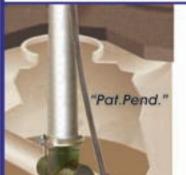
"IMS and IMS Mobile are designed to provide everything needed to manage, test and repair a water distribution system," says Hurley. "You can go out to a fire hydrant or valve, capture the GPS data, take a picture and insert it into the record, make notes about deficiencies that will automatically create a work order, test the equipment and record the data manually or wirelessly to IMS Mobile on your laptop or hand-

held device. IMS Mobile even accesses Google Earth to provide maps and driving directions." (Figure 6)

Software updates are free for the first year and available by subscription after that. Updates are done automatically on any Internet-connected computer. The software includes a backup application and allows Hurco, with permission, to link to the user's computer and fix issues remotely.

"We have videos on our website that show how to navigate the screens and use the software," says Hurley. "There are also Power-Point presentations and tutorials that show how IMS works and teach technicians how to use it."

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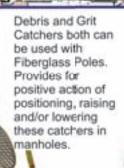
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CERTIFIED SUCCESS

An employee certification program at Marietta Water leads to better morale, staff retention, and a more accountable and professional workforce

By Ken Wysocky

ew employees at Marietta Water in Marietta, Ga., used to learn the ropes through informal on-the-job training that lacked accountability.

These days, they're held to a much higher standard: pass a state certification test in water distribution or wastewater collection or lose their job. That approach has led to better morale, lower turnover and increased efficiency.

"We figured we could improve the stability of the workforce by developing a higher-qualified employee," says Bob Snelson, depart-



Marietta Water employees Brad Wheeling, left, and Hayeon Small study for a certification test.

ment director for the past 10 years. "The certification requirement also gets our employees classified at higher levels with higher pay.

"My first two years here, we had a lot of turnover. But in the last four years, we've had maybe two people leave out of 42 total employees. I've also seen a marked

improvement in employees' selfesteem, and better camaraderie because of the shared level of achievement."

Education partner

Marietta Water partners with Chattahoochee Technical College, which offers the courses whenever the department can supply a minimum number of students. When the program started in 2003, the school offered two wastewater collection and two water distribution courses per year; that has scaled back to one of each, as fewer people need to take the courses.

So far, 32 employees — 28 field operators, three supervisors and a superintendent — have earned at least one certification. The department supports dual certifications, too, and 17 people have earned them. "That really adds to their self-pride when they get two certifications under their belt," Snelson says.

Snelson was the first to take one of the 10-week courses, just to see if they were worthwhile: they cost about \$1,000. Employees get paid while they attend two 2-hour sessions a week, held at the end of the workday.

At first, students took a less-structured course at another institution. That, combined with a long wait to take the state certification test, meant only 20 to 30 percent passed. "It might have taken three months before they could take a test, so the retention of the material they learned was pretty low," Snelson says.

Chattahoochee offers a more

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Ted Rulseh at 877/953-3301, or email editor@mswmag.com.



Bob Snelson (middle with white shirt and sportcoat) and Marietta Water operators show off an award for State of Georgia's Best Distribution System of the Year and Wastewater System of the Year (for medium system size), presented at the fall 2010 meeting of the Georgia Association of Water Professionals.

structured and rigorous curriculum and requires employees to take the test within one week of completing the classes. Those who fail the test the first time have to pay for a second test. To support students for the second exam, the department offers remedial training, based on a report that shows where they did poorly on the original test.

Benefits abound

Having certified employees gives the department more staffing flexibility. That's important because, according to benchmarks established by the American Water Works Association, the city has a smallerthan-average workforce for its 25-square-mile area with 300 miles of water mains and 250 miles of sanitary sewers.

To illustrate flexibility, Snelson points to callback crew assignments. After-hours emergency calls can include a wide array of problems, but that's less of an issue with many employees knowledgeable in multiple areas. And with a deeper pool of people available, there is less chance of fatigue and related safety issues.

"You don't have to pick and choose employees for callback duty because they all have very similar training, and we're not stretching limited manpower to cover a broader spectrum in time in responding to emergency situations," Snelson says.

"My first two years here, we had a lot of turnover.

But in the last four years, we've had maybe two
people leave out of 42 total employees. I've also
seen a marked improvement in employees'
self-esteem, and better camaraderie because
of the shared level of achievement."

Bob Snelson

"Before, we had certain people who needed to be on call for larger amounts of time. Now we have more confidence that whoever we assign can respond to every emergency we encounter. They're all competent in diagnosing a problem and directing a course of corrective action."

Snelson can't quantify costsavings from the flexibility, but he does note that repairs generally get made faster because the people who respond are knowledgeable. "You're not paying as much overtime as you otherwise might," he says. In addition, more employees are eligible for overtime callback pay, and that boosts morale.

Less burnout

The program helps reduce burnout, too, because it's easier to rotate people from job to job — sometimes annually. Sometimes people are switched to different jobs to enhance their skills, based on periodic supervisor reviews that determine who needs additional training in certain areas.

"Plus, it gives them a fresh look at what they're doing day to day, and gives them the chance to work with new people," Snelson says. "That builds camaraderie and emphasizes a team approach."

There is one down side to the program: In a small workforce with minimal turnover, opportunities for advancement are limited. Therefore, the department is seeking city approval for a pay system that also rewards longevity.

Overall, employees have embraced the program. Snelson says that's because they get a sense of achievement by succeeding at a higher level, and the certifications bolster their confidence and professionalism. Moreover, people appreciate an employer that cares about their careers.

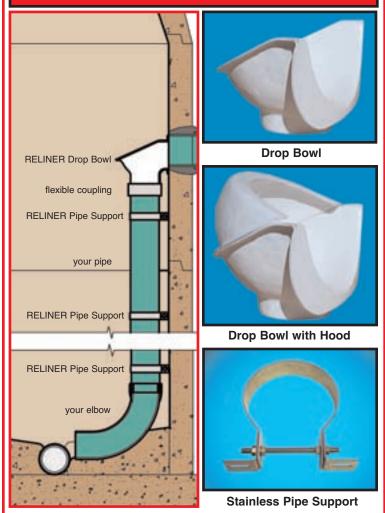
"They see management making an investment in them, and they get to prove they can measure up to our expectations," Snelson notes. "They're brought onto a team with certain standards to uphold, and by reaching those standards, they're supporting their fellow workers, and vice versa. Everyone is held accountable, and I believe people like to be held accountable." •



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520 Brooks Rd. Iowa Falls, IA 50126 800-648-5011 • 641-648-5011 Fax: 641-648-5013 gillespie@camspray.com www.camspray.com Ad on page 89

Canplas, LLC

11402 E 53rd Ave., Ste. 200
Denver, CO 80239
888-461-5307 • 303-373-1918
Fax: 888-461-5309
denver.sales@canplas.com
www.canplasplumbing.com



Carboline

2150 Schuetz Rd.
2150 Schuetz Rd.
St. Louis, MO 63146
800-848-4645 • 314-644-1000
Fax: 314-587-2697
mconnor@carboline.com
www.carboline.com
Ad on page 33

Carylon Corporation

2500 W Arthington St. Chicago, IL 60612 800-621-4342 • 312-666-7700 Fax: 312-666-5810 info@caryloncorp.com www.caryloncorp.com Ad on page 11

Central Oklahoma Winnelson

Oklahoma City, OK 73127 888-947-8761 • 405-947-8761 Fax: 405-947-1934 krjones@winnelson.com www.centralwinnelson.com Ad on page 38

Chempace Corporation

339 Arco Dr.
Toledo, OH 43607
800-423-5350 • 419-535-0101
Fax: 419-535-0531
vhorvath@chempace.com
www.chempace.com
Ad on page 18

Chempure Products Corp.

PO Box 740
Bolivar, OH 44612
800-288-7873 • 330-874-4300
Fax: 330-874-4448
chempure@gmail.com
www.chempure.com
Ad on page 105



Cherne Industries, Inc.

5700 Lincoln Dr.
Minneapolis, MN 55436
800-843-7584 • 952-933-5501
Fax: 800-843-7585
gdanaher@cherneind.com
www.cherneind.com

Cloverleaf Tool Co.

PO Box 1338
Tallevast, FL 34270
800-365-6583 • 941-739-0707
Fax: 941-739-0001
sales@cloverleaftool.com
www.cloverleaftool.com
Ad on pages 26 and 110



Cobra Technologies

4806 Wright Dr., Bldg. C Smyrna, GA 30082 800-443-3761 • 770-435-8991 Fax: 770-435-0402 sales@cobratec.com www.cobratec.com

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Cretex Specialty Products

N16 W23390 Stoneridge Dr., Ste. A Waukesha, WI 53188 800-345-3764 • 262-542-8153 Fax: 262-542-0301 edickson@cretexseals.com

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Cua Claws

2376 Maize Rd. Twentynine Palms, CA 92277 714-697-8697 jerry@cuaclaws.com www.cuaclaws.com

Ad on page 112



CUES, Inc.

3600 Rio Vista Ave.
Orlando, FL 32805
800-327-7791 • 407-849-0190
Fax: 407-425-1569
salesinfo@cuesinc.com
www.cuesinc.com

Ad on page 42

Custom Biologicals, Inc.

1239 E Newport Center Dr., Ste. 117 Deerfield Beach, FL 33442 561-998-1699 • Fax: 561-998-2699 Barbara@custombio.us www.wastewaterproblems.com

Ad on page 112

Cyclops Electronics, Inc.

PO Box 1796 Boerne, TX 78006 830-249-9756 • Fax: 830-249-8535 cyclopstv@beecreek.net www.cyclopstv.com

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Duke's Root Control, Inc.

1020 Hiawatha Blvd. W Syracuse, NY 13204 800-447-6687 • 315-472-4781 Fax: 315-475-4203 lynn@dukes.com www.dukes.com

E

E.H. Wachs

455 Commanche Cir. Harvard, IL 60033 866-392-1060 • 815-943-4785 Fax: 815-943-5098 sales@ehwachs.com www.ehwachs.com



Echologics Engineering, Inc.

50 Ronson Dr., Unit 155 Toronto, ON M9W 1B3 Canada 866-324-6564 • 416-249-6124 Fax: 416-249-8833 sales@echologics.com www.echologics.com

Eldred Environmental

1275 W 11th St. Milan, IL 61264 800-613-3640 • 309-787-3640 Fax: 309-787-3635 info@fol-da-tank.com www.eldredenvironmental.com



Electric Eel Mfg.

501 W Leffel Ln. Springfield, OH 45501 800-833-1212 • 937-323-4644 Fax: 937-323-3767 info@electriceel.com www.electriceel.com

Environmental Products & Accessories, LLC

PO Box 513 Hixson, TN 37343 866-448-5547 • 423-876-4366 Fax: 866-206-2628 info@epasales.com www.epasales.com Ad on page 42

Epvirosight...

Envirosight, LLC

111 Canfield Ave., Unit B3 Randolph, NJ 07869 866-936-8476 • 973-252-6700 Fax: 973-252-1176 office@envirosight.com www.envirosight.com

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Enz USA, Inc.

1585 Beverly Ct., Unit 115 Aurora, IL 60502 877-369-8721 • 630-692-7880 Fax: 630-692-7885 sales@enzusainc.com www.enzusainc.com

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Epoxytec

5889 SW 21st St.
West Park, FL 33023
877-463-7699 • 954-961-4656
Fax: 954-961-2395
drapanos@epoxytec.com
www.epoxytec.com
Ad on page 48

Extend Manufacturing LLC

8404 Venture Cir. Weston, WI 54476 715-359-3002 • Fax: 715-359-6642 chris@aplaser.com www.tmx-excavator.com

F



tamhost apps

FamHost Hosted Business Systems

2030 S Mead St. Wichita, KS 67211 800-658-1676 • 316-267-9910 Fax: 316-462-0728 pfarmer@famhost.com www.famhost.com

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Flowtite Pipe

18585 Samuels Rd. Zachary, LA 70791 225-658-6166 • Fax: 225-658-0947 bbasiri@flowtitepipe.com www.flowtitepipe.com

Ad on page 110

Fluid Conservation Systems

502 Techne Center Dr., Šte. B Milford, OH 45150 800-531-5465 • 513-831-9335 Fax: 513-831-9336 mblackburn@fluidconservation.com www.fluidconservation.com

Fluid Technology, Inc.

PO Box 937 Oxford, OH 45056 888-844-7824 • 513-241-1600 Fax: 513-756-1995 info@fluidtechinc.net www.fluidtechinc.net Ad on page 111

Footage Tools, Inc.

54 Audia Ct., Unit 1 Vaughan, ON L4K 3N4 Canada 888-737-3668 • 905-695-9900 Fax: 905-695-8874 df@footage.ca www.footagetools.com

Ad on page 111

Fox Industries, Inc.

3100 Falls Cliff Rd.
Baltimore, MD 21211
888-760-0369 • 410-243-8856
Fax: 410-243-2701
info@foxind.com
www.foxind.com

Fresh Creek Technologies, Inc.

1384 Pompton Ave., Ste. 2 Cedar Grove, NJ 07009 800-741-9486 • 973-237-9099 Fax: 973-237-0744 fresh@freshcreek.com www.freshcreek.com

G

Gamajet Cleaning Systems, Inc.

604 Jeffers Cir.
Exton, PA 19341
877-426-2538 • 610-408-9940
Fax: 610-408-9945
sales@gamajet.com
www.gamajet.com
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GapVax, Inc.

575 Central Ave. Johnstown, PA 15902 888-442-7829 • 814-535-6766 Fax: 814-539-3617 inquiry@gapvax.com www.gapvax.com Ad on page 37



General Pipe Cleaners, div. of General Wire Spring

1101 Thompson Ave. McKees Rocks, PA 15136 800-245-6200 • 412-771-6300 Fax: 412-771-2771 info@drainbrain.com www.drainbrain.com

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General Pump

1174 Northland Dr. Mendota Heights, MN 55120 888-474-5487 • 651-454-6500 Fax: 651-454-8015 sales@gpcompanies.com www.generalpump.com

Giant Industries, Inc.

900 N Westwood Ave. Toledo, OH 43607 419-531-4600 • Fax: 419-531-6836 www.qiantpumps.com

Gorman-Rupp Company

600 S Airport Rd. Mansfield, OH 44903 419-755-1011 • Fax: 419-755-1251 grsales@gormanrupp.com www.GRpumps.com

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Gradall Industries, Inc.

406 Mill Ave. SW New Philadelphia, OH 44663 330-339-2211 • Fax: 330-339-8468 mtnorman@gradall.com www.gradallindustries.com

Great Lakes Underground Equip. Co., Inc.

12777 W Silver Spring Rd.
Butler, WI 53007
866-781-9100 • 262-781-9100
Fax: 262-783-2376
glueco@gmail.com
www.glueco.net
Ad on page 112

H

Hach Company

5600 Lindbergh Dr. Loveland, CO 80539 800-227-4224 • Fax: 970-669-2932 info@hach.com www.hach.com



Hach Flow Meter Products & Services

4539 Metropolitan Ct. Frederick, MD 21704 800-368-2723 • 301-874-5599 Fax: 301-874-8459 hachflowsales@hach.com www.hachflow.com

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Hammelmann Corp.

600 Progress Rd. Dayton, OH 45449 800-783-4935 • 937-859-8777 Fax: 937-859-9188 mail@hammelmann.com www.hammelmann.com

HammerHead Trenchless Equipment

PO Box 3 Oconomowoc, WI 53066 800-331-6653 • 262-567-8833 Fax: 262-567-5068 info@hammerheadmole.com www.hammerheadtrenchless.com

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Hathorn Corporation 75 W Beaver Creek Rd., Unit 7 Richmond Hill, ON L4B 1K6 Canada 905-886-2835 • Fax: 289-597-2800 hathorncorporation@rogers.com www.hathorncorp.com

Hi-Vac Corporation

117 Industry Rd. Marietta, OH 45750 800-752-2400 • 740-374-2306 Fax: 740-374-5447 sales@hi-vac.com www.hi-vac.com Ad on page 43

Hibon Inc..

A division of Ingersoll Rand

12055 Cote de Liesse Dorval, QC H9P 1B4 Canada 888-704-4266 • 514-631-3501 Fax: 866-786-9163 jeff peterson@irco.com www.hibon.com

Hot Jet USA/Power Line Industries

14717 Heritage Crest Way Riverton, UT 84065 800-213-3272 • 801-545-0777 Fax: 801-545-9132 powerlinechem@yahoo.com www.hotjetusa.com

Hurco Technologies, Inc.

409 Enterprise St. Harrisburg, SD 57032 800-888-1436 • 605-743-2466 Fax: 605-743-2465 lynn@gethurco.com www.gethurco.com Ad on page 41

ICS, PowerGrit

4909 SE International Way Portland, OR 97222 800-321-1240 • Fax: 503-653-4393 info@powergrit.com www.powergrit.com

Infrastructure Repair Systems, Inc.

4301 A 34th St. N St. Petersburg, FL 33714 877-327-4216 • 727-327-4216 Fax: 727-327-4118 irsi@irsi.net www.irsi.net Ad on page 85



Inliner Technologies

1468 W Hospital Rd. Paoli, IN 47454 812-723-0704 • Fax: 812-723-5998 info@inliner.net www.inliner.net

Insight Vision

600 Dekora Woods Blvd. Saukville, WI 53080 800-488-8177 • 262-268-9950 Fax: 262-268-9952 steve@insightvisioncameras.com www.insightvisioncameras.com

International Link, LLC

25 Washington Ct. Mullica Hill, NJ 08062 856-599-4838 • Fax: 856-417-3129 info@internationallinkllc.com www.internationallinkllc.com Ad on page 112

Tack Doheny Companies

Jack Doheny Companies

PO Box 609 Northville, MI 48167 800-336-4369 • 248-349-0904 Fax: 248-349-2774 sales@dohenysupplies.com www.dohenysupplies.com

Jetter Depot

745 Atlanta Rd., Ste. 210 Cumming, GA 30040 678-549-2621 • Fax: 678-807-2944 sales@jetterdepot.com www.jetterdepot.com Ad on page 112

John Bean Sprayers

PO Box 1404 LaGrange, GA 30241 800-241-2308 • 706-882-8161 Fax: 706-884-3268 andrewt@durand-wayland.com www.durand-wayland.com



3NS3.

Lansas Products

1320 S Sacramento St. Lodi, CA 95240 800-452-4902 • 209-334-4115 Fax: 209-339-8260 information@lansas.com www.lansas.com

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LaPorte & Associates

5515 SE Milwaukie Ave. Portland, OR 97202 800-542-2125 • 971-404-3506 Fax: 503-231-9021 aborgens@laporte-insurance.com www.wasteins.com Ad on page 112

Larox Flowsys Inc.

808 Barkwood Ct., Ste. N Linthicum, MD 21090 410-636-2250 • Fax: 410-636-9062 todd.loudin@larox.us www.larox.us



Laser Specialists, Inc.

19879 W 156th Olathe, KS 66062 800-377-4272 • 913-780-9990 Fax: 913-780-9815 sales@lasergps.com www.lasergps.com

Lee Supply Company, Inc.

305 1st St. Charleroi, PA 15022 800-353-3747 • 724-483-3543 Fax: 724-483-0577 info@leesupply.com www.leesupply.com

Ad on page 17 **LMK Technologies**

1779 Chessie Ln. Ottawa, IL 61350 815-433-1275 • Fax: 815-433-0107 sales@lmkenterprises.com www.performanceliner.com

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Lucity, Inc.

10561 Barkley Ste. 500 Overland Park, KS 66212 800-492-2468 • 913-341-3105 Fax: 913-341-3128 info@lucity.com www.lucity.com



Mainline Backflow Products, Inc.

12530 - 128 St. Edmonton, AB T5L 1C9 Canada 877-734-8691 • 780-413-7204 Fax: 780-457-1210 tomc@backwatervalve.com www.backwatervalve.com

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MAX-LIFE Mfg.

11580 Seaboard Cir. Stanton, CA 90680 888-873-6295 • 714-898-4830 Fax: 714-897-2810 dnye@flexmax.com www.flexmax.com Ad on page 55

McElroy Manufacturing, Inc.

PO Box 580550 Tulsa, OK 74158 918-836-8611 • Fax: 918-831-9258 sales@mcelroy.com www.mcelrov.com Ad on page 110

McGard

3875 California Rd. Orchard Park, NY 14127 888-888-9192 • 716-662-8980 Fax: 716-662-8985 rglass@mcgard.com www.mcgard.com/security Ad on page 73

Mil-Ram Technology, Inc.

4135 Business Center Dr. Fremont, CA 94538 888-464-5726 • 510-656-2001 Fax: 510-656-2004 sls@mil-ram.com www.mil-ram.com

Mr. Manhole

125 S Canal St. Delphos, OH 45833 419-229-3015 • Fax: 419-692-1600 sales@mrmanhole.com www.mrmanhole.com

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MTech

7401 First Place Cleveland, OH 44146 800-362-0240 • 440-646-0996 Fax: 440-646-9953 sales@mtechcompany.com www.mtechcompany.com Ad on page 111

Mueller SYSTEMS

Mueller Systems

10210 Statesville Blvd. Cleveland, NC 27013 800-323-8584 • 704-278-2221 customercare@muellersystems.com www.muellersystems.com

Mueller Water Products

Mueller Water Products

1200 Abernathy Rd. NE, Ste. 1200 Atlanta, GA 30328 770-206-4200 jpensec@muellerwp.com www.muellerwaterproducts.com

Municipal Sales, Inc.

PO Box 4743 Queensbury, NY 12804 518-747-2044 • Fax: 518-747-5490 mark.reynolds@municipalsales.net www.municipalsales.net Ad on page 97

Municipal Services, Inc.

420 Boston Turnpike Shrewsbury, MA 01545 508-842-8901 • Fax: 508-842-9648 rapocushion@yahoo.com www.rapobiz.com Ad on page 105

MyTana Mfg. Company, Inc.

746 Selby Ave. St. Paul, MN 55104 800-328-8170 • 651-222-1738 Fax: 651-222-1739 mytana@mytana.com www.mytana.com



National Pump & Compressor

3365 W Cardinal Dr. Beaumont, TX 77705 888-840-5886 • 409-840-5886 Fax: 409-840-5806 info@npcrents.com www.npcrents.com

NAWT, Inc.

PO Box 220 Three Lakes, WI 54562 800-236-6298 • 715-891-3473 Fax: 715-546-3786 info@nawt.org www.nawt.org



NozzTeq®, Inc. 1497 Main St., Unit 354 Dunedin, FL 34698 866-620-5915 • 603-413-6583 Fax: 603-413-6744 info@nozzteg.com www.nozzteq.com Ad on page 54

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02 Aeration Technologies, LLC

408 Johns Rd. Boerne, TX 78006 888-801-1586 • 830-743-4936 paulswoyer@yahoo.com www.paulswoyerseptics.com Ad on page 111



Parson Environmental Products, Inc. PO Box 4474

Reading, PA 19606 800-356-9023 • 610-582-6060 Fax: 610-582-6064 sales@parsonenvironmental.com www.parsonenvironmental.com Ad on page 105

Pat's Pump & Blower, LLC

630 W Church St. Orlando, FL 32805 800-359-7867 • 407-841-7867 Fax: 407-648-2096 patspump@aol.com www.patspump.com
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Pearpoint, Inc.

39-740 Garand Ln., Unit B Palm Desert, CA 92211 800-688-8094 • 760-343-7350 Fax: 760-343-7351 pearpoint.sales.us@spx.com www.radiodetection.com
Ad on page 38

Perma-Liner Industries, Inc.

13000 Automobile Blvd., Ste. 300 Clearwater, FL 33762 866-336-2568 • 727-507-9749 Fax: 727-507-9849 info@perma-liner.com www.perma-liner.com Ad on page 5

Petersen Products Co.

421 Wheeler Ave. Fredonia, WI 53021 800-926-1926 • 262-692-2416 Fax: 262-692-2418 sales@petersenproducts.com www.pipeplug.com Ad on page 50

Pipe Tool Specialties

PO Box 21416 Keizer, OR 97307-1416 503-390-6794 • Fax: 503-390-6670 pts4422@vahoo.com Ad on page 112



Pipeline Analytics

200 Cedar Ridge Dr., Ste. 207 Pittsburgh, PA 15205 877-626-8386 • Fax: 412-489-6471 wincan@pipelineanalytics.com www.pipelineanalytics.com

Pipeline Renewal Ad on page 77

PipeLine Renewal Technologies

111 Canfield Ave., Unit B3 Randolph, NJ 07869 866-936-8476 • 973-252-6700 Fax: 973-252-1176 mail@pipelinert.com www.pipelinert.com



PipeLogix, Inc.

PO Box 14014 Palm Desert, CA 92255 866-299-3150 • 760-779-1700 Fax: 760-406-6023 joan.stone@pipelogix.com www.pipelogix.com Ad on page 107

Pow-R Mole Sales, LLC

1400 Commerce Pkwy. Lancaster, NY 14086 800-344-6653 • 716-683-2486 Fax: 716-683-6372 brian@powrmole.com www.powrmole.com

Poweram

150 N 18th St. Barron, WI 54812-0153 715-537-9050 • Fax: 715-537-5655 info@poweram.com www.poweram.com

Productive Carbides, Inc.

10265 K Spartan Dr. Cincinnati, OH 45215 800-676-7649 • 513-771-7092 Fax: 513-771-7092 www.productivecarbides.com Ad on page 112

Prospan Manufacturing Co.

10013 Norwood St. Rosemont, IL 60018 888-413-8100 • 630-860-1930 Fax: 847-698-3549 prospanshoring@gmail.com www.prospanshoring.com Ad on page 93



Prototek Corporation

PO Box 1700 Poulsbo, WA 98370 800-541-9123 • 360-779-1310 Fax: 360-779-1510 prototeksales@prototek.net www.prototek.net Ad on page 28

Pure Technologies US, Inc.

8920 State Rte. 108, Ste. D Columbia, MD 21045 855-280-7873 • 443-766-7873 Fax: 443-766-7877 info@puretechltd.com www.puretechltd.com

Radiodetection

154 Portland Rd. Bridgton, ME 04009 877-247-3797 • 207-647-9495 Fax: 207-647-9496 www.spx.com www.radiodetection.com

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RapidView IBAK North America

1828 W Olson Rd. Rochester, IN 46975 800-656-4225 • 574-224-5426 Fax: 574-223-7953 info@rapidview.com www.rapidview.com Ad on page 13

Ratech Electronics, Ltd.

260-7 Spinnaker Way Concord, ON L4K 4P9 Canada 800-461-9200 • 905-660-7072 Fax: 905-660-1519 sales@ratech-electronics.com www.ratech-electronics.com Ad on page 81

RedZone Robotics, Inc.

91 43rd St., Ste. 250 Pittsburgh, PA 15201 412-476-8980 • Fax: 412-476-8981 info@redzone.com www.redzone.com Ad on page 106

Reelcraft Industries, Inc.

2842 E Business Hwy. 30 Columbia City, IN 46725 800-444-3134 • 260-248-8188 Fax: 260-248-2605 reelcraft@reelcraft.com www.reelcraft.com Ad on page 111

RELINER/Duran Inc.

53 Mt. Archer Rd. Lyme, CT 06371 800-508-6001 • 860-434-0277 Fax: 860-434-3195 duran@reliner.com www.reliner.com Ad on page 57



Rice Signs

PO Box 3170 Auburn, AL 36831 888-728-7665 • Fax: 877-546-6165 sales@ricesigns.com www.ricesigns.com Ad on page 18

RIDGID

400 Clark St. Elvria, OH 44035 800-769-7743 • 440-329-4650 Fax: 440-329-4862 ridgidinfo@emerson.com www.RIDGID.com Ad on page 27

RootX

PO Box 7626 Salem, OR 97303 800-844-4974 • Fax: 503-485-5229 rootx@rootx.com www.rootx.com



RS Technical Services, Inc.

1327 Cleaa St. Petaluma, CA 94954 800-767-1974 • 707-778-1974 Fax: 707-778-1981 bobg@rstechserv.com www.rstechserv.com Ad on page 63

Safety Corporation of America

4745 Bakers Ferry Rd. SW Atlanta, GA 30336 800-746-7464 • 404-505-0510 Fax: 404-505-0506 tsskeith@aol.com www.shorina.com Ad on page 95

Savatech Corp.

413 Oak Pl., Bldg. 5-J Port Orange, FL 32127 888-436-9778 • 386-760-0706 Fax: 386-760-8754 page@savatech.com www.savatech.com Ad on page 28

Sekisui SPR Americas, LLC

1045 Research Center Atlanta Dr., Ste. F Atlanta, GA 30331 866-627-7772 • 678-510-1820 Fax: 678-510-1826 info@sekisui-spr.com www.sekisui-spr.com

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Sewer Equip Co of Florida, Inc.

1102 N Dixie Frwy. New Smyrna Beach, FL 32168 800-635-2323 • 386-428-3303 Fax: 386-427-4552 csewerequipment@cfl.rr.com www.sewerequipmentco.com Ad on page 110



Sewer Equipment Co. of America

12 Howard St Chadwick, IL 61014 800-323-1604 • 815-684-5566 Fax: 815-684-5568 sales@sewerequipment.com www.sewerequipment.com

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SewerLock

81636 Impala Dr. La Quinta, CA 92253 408-761-5882 • Fax: 760-771-0933 dave@sewerlock.com www.sewerlock.com

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Simple Solutions LLC

6 Jacobs Rd. West Milford, NI 07480 866-667-8465 • 973-846-7817 Fax: 973-858-0219 sales@industrialodorcontrol.com www. Industrial Odor Control. com

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Smith & Loveless, Inc.

14040 Santa Fe Trail Dr. Lenexa, KS 66215 800-898-9122 • 913-888-5201 Fax: 913-894-0488 answers@smithandloveless.com www.smithandloveless.com

Southeast Pipe Survey. Inc.

3523 Williams St. Patterson, GA 31557 912-647-2847 • Fax: 912-647-2869 drh@southeastpipe.com www.southeastpipe.com

Southland Tool Mfg. Inc.

1430 N Hundley St. Anaheim, CA 92806 714-632-8198 • Fax: 714-632-8228 david@southlandtool.com www.southlandtool.com

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SpectraShield Liner Systems

PO Box 24354 Jacksonville, FL 32241 800-284-2030 • 904-419-4889 Fax: 904-419-4892 bklopfenstein@ccispectrum.com www.spectrashield.com Ad on page 99

Stephen's Technologies, Inc.

31004 Hwy. 27 Lake Hamilton, FL 33851 888-783-7436 • 863-438-8660 Fax: 863-439-3755 stephenstechnologies@yahoo.com www.stephenstech.com

Sto-Away Power Cranes, Inc.

9306 Grand Blvd. Crown Point, IN 46307 800-622-9797 • 219-942-9797 Fax: 219-947-2503 stoawav@comcast.net www.stoaway.com Ad on page 48



Super Products. LLC

17000 W Cleveland Ave. New Berlin, WI 53151 800-837-9711 • 262-784-7100 Fax: 262-784-9561 info@superproductscorp.com www.superproductscorp.com

Superior SMOKE

Superior Signal Company, LLC

PO Box 96 Spotswood, NJ 08884 800-945-8378 • 732-251-0800 Fax: 732-251-9442 info@superiorsignal.com www.superiorsignal.com Ad on page 111





T&T Tools, Inc.

PO Box 531 Spring Lake, MI 49456 800-521-6893 • 616-296-0623 Fax: 800-521-3260 sales@tandttools.com www.mightyprobe.com

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The Man Pan

309 Buffalo Ridge Rd. McMurray, PA 15317 724-942-9500 • Fax: 724-942-7591 johnmanning@themanpan.com www.themanpan.com

The Strong Company, Inc.

4505 Emmet Sanders Rd. Pine Bluff, AR 71601 800-982-8009 • 870-535-7617 Fax: 870-850-6933 info@strongseal.com www.strongseal.com Ad on page 23

Tnemec Company, Inc.

6800 Corporate Dr. Kansas City, MO 64120 800-863-6321 • 816-483-3400 Fax: 816-483-3969 marketing@tnemec.com www.tnemec.com

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TRIC Tools, Inc.

2317 Blanding Ave., Ste. D Alameda, CA 94501 888-883-8742 • 510-865-8742 Fax: 510-217-9493 info@trictools.com www.trictools.com Ad on page 112

Turbo Fog

3334 S Tech Blvd. Miamisburg, OH 45342 800-394-0678 • 937-886-9100 Fax: 937-886-9300 sales@turbo-fog.com www.turbo-fog.com

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TV Ferret. Inc.

840 State Rte. 50 Burnt Hills, NY 12027 518-399-2211 • Fax: 518-399-3118 info@tvferret.com www.tvferret.com

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Liquid Level Indicator



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GapVax, Inc.

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steve@insightvisioncameras.com www.insightvisioncameras.com

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Big Blue Bio-Block, 5-lb	MS-49828	99.95	89.96
Big Blue Bio-Block, 10-lb	MS-49829	199.95	179.96
Big Blue Bio-Block, 30-lb	MS-49831	399.95	359.96
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Carylon Corporation

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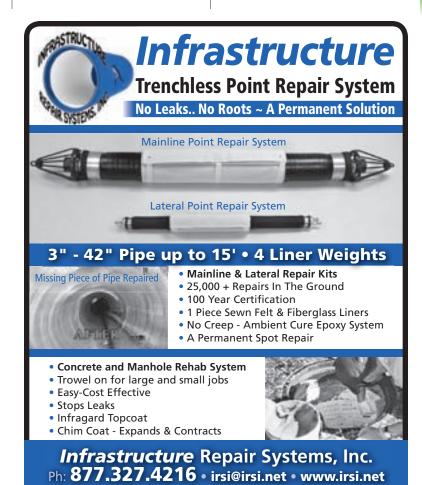
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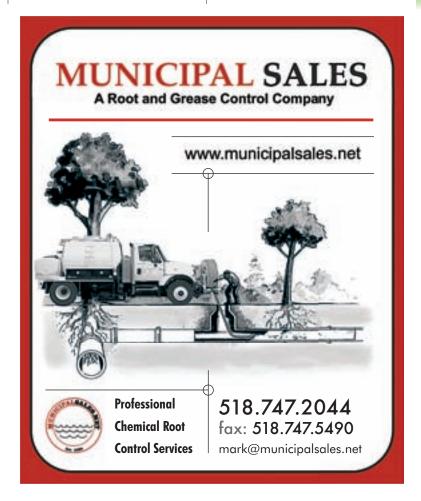
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Mueller Systems

10210 Statesville Blvd. Cleveland, NC 27013 800-323-8584 • 704-278-2221 customercare@muellersystems.com www.muellersystems.com

Mueller Water Products

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Hammelmann Corp.

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Monday - Education Day • Tuesday - Thursday - Exhibits





WORTH NOTING

PEOPLE/AWARDS

Sen. James M. Inhofe of Oklahoma received the Citation for Exemplary Service to Public Works Award from the American Public Works Association.

The Chittenden County Regional Stormwater Education Program (Vermont) received the Green Mountain Water Environment Association Stormwater Award for outstanding performance in stormwater education and its contribution to the stormwater field.

StormwateRx, a provider of industrial stormwater treatment and filtration systems, won the Green Enterprise and Technology Award from the Association of Washington Business.

Alison Bick (Short Hill, N.J.) was named the U.S. winner of the Water Environment Federation Stockholm Junior Water Prize.

The Great Lakes and St. Lawrence Cities Initiative announced the following award recipients at its annual meeting:

- City of Milwaukee and Milwaukee Metropolitan Sewerage District, Leadership Award
- City of Trois Rivieres, Quebec, Innovation Award
- City of Montreal, Progress Award
- City of Sheboygan, Wis., Wege Small Cities Sustainability Best Practices Award

The Water Environment Federation will honor the first 17 recipients of the WEF Fellow Recognition Program during WEFTEC Oct. 15-19 in Los Angeles. The program honors the professional achievements, stature and contributions of WEF members in various water fields. Fellow recipients will be permitted to use the WEF Fellow designation after their names in a professional capacity. The 2011 recipients are:

- Pedro Alvarez, Rice University, Civil & Environmental Engineering, Houston, Texas
- Walter Bailey, DC Water & Sewer Authority, Washington, D.C.
- James L. Barnard, Black & Veatch, Leawood, Kan.
- Paul L. Bishop, National Science Foundation, Arlington, Va.
- Pen-Chi Chiang, Institute of Environmental Engineering, National Taiwan University Taipei, Taiwan
- Stephan D. Frank, Metro Wastewater Reclamation District, Denver, Colo.
- Paul L. Freedman, Limno Tech, Ann Arbor, Mich.
- Thomas E. Kunetz, Metropolitan Water Reclamation District of Greater Chicago, Ill.
- Eric R. Lecuyer, Central States WEA, Crystal Lake, Ill.
- Bruce E. Logan, Penn State University, University Park, Pa.
- Nancy G. Love, University of Michigan, Ann Arbor, Mich.
- Tim Madhanagopal, Orange County Utilities, South Water Reclamation Facility, Orlando, Fla.
- John T. Morris, Morris Water Resources Consultants, San Marino,
- John T. Novak, Virginia Poly Institute & State University, Blacksburg, Va.
- Krishna R. Pagilla, Illinois Institute of Technology, Chicago
- James Tony Parrott, Metropolitan Sewer District of Greater Cincinnati, Ohio
- Spyros Pavlostathis, Georgia Institute of Technology, Atlanta

Orange Water and Sewer Authority's Jones Ferry Road Water Treatment Plant in North Carolina received the Phase IV Excellence In Water Treatment Award from the Partnership for Safe Water.

Brad Davenport received the 2011 Storm Drain Reveal People's Choice Award from the James River Basin Partnership and the City of Springfield (Mo.) Public Works Storm Water Services Division for his storm drain mural titled "Down to the River."

The American Public Works Association announced its Public Works

Leaders for 2011:

- Carl R. Dawson, Director of Public Works, City of Raleigh, N.C.
- Mike Eastling, Director of Public Works, City of Richfield, Minn.
- Julia Hunt, Director of Water Utilities, City of Arlington, Texas
- John P. Lawlor Jr., Public Works Director, City of Waterbury, Conn.
- Mark V. Massaro, Director of Public Works, Orange County Government, Orlando, Fla.
- · Gary M. Scheipeter, Public Works Superintendent, City of Clayton, Mo.
- Teresa Scott, Public Works Director, City of Gainesville, Fla.
- Jeffrey M. Smith, City Engineer, City of Peoria, Ill.
- Christine Walsh, Director of Operations, City of Beloit, Wis.

LEARNING OPPORTUNITIES

ASCE

The American Society of Civil Engineers has these courses:

- Sept. 6 Retaining and Recruiting A Personnel, webinar
- Sept. 7 Introduction to Green Design, webinar
- Sept. 13 Release the Leader Within You and Others: The Seven Qualities of Effective Leaders, webinar
- Sept. 22 Sustainable Sites Stormwater Design and Water Efficiency Points for LEED Projects, webinar
- Sept. 29-30 Stormwater BMPs That Work: Effective Analysis, Design and Maintenance, Philadelphia

Visit www.asce.org.

APWA

The American Public Works Association has a Selection Success audio/Web broadcast Sept. 27. Visit www.apwa.net.

AWWA

The American Water Works Association has a Financial Management: Cost of Service Rate-Making seminar in Las Vegas Sept. 21-23. Visit www. awwa.org.

Florida

The Florida Stormwater Association has a New Directions in Stormwater Permits and Programs seminar Sept. 9 in Orlando. Visit www. florida-stormwater.org.

Wisconsin

The Wisconsin Department of Natural Resources is offering these

- Sept. 7 Cross Connection Control, Spooner
- Sept. 20 Cross Connection Control, Waunakee
- Sept. 27-28 Water System Operation Basics, Mt. Horeb
- Oct. 11-12 Water System Operation Basics, Mt. Horeb
- Oct. 12-15 Water System Operation Basics, Plover Visit www.dnr.state.wi.us.

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

- Sept. 12-13 Advanced Steady Flow Modeling Using HEC-RAS
- Sept. 14-16 Modeling Unsteady Flow Using HEC-RAS M715
- Oct. 3-4 Essentials of Hydraulics for Civil Engineers and Designers
- Dec. 6-8 Sewer and Collection System Engineering seminar Visit www.epdweb.engr.wisc.edu. ◆

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.

CALENDAR

Sept. 11-14

American Water Works Association Distribution Systems Symposium and Exposition and Water Security Conference, Nashville, Tenn. Visit www.awwa.org.

Sept. 18-21

2011 American Public Works Association Congress: The Best Show in Public Works, Colorado Convention Center, Denver, Colo, Call 816/595-5241 or visit

Sept. 21-23

Wisconsin Water Association Annual Conference, Kalahari Resort, Wisconsin Dells, Wis. Visit www.wiawwa.org.

Sept. 27-29

American Water Works Association EnergySMART Conference, Seaport Hotel, Boston, Mass. Visit www.awwa.org.

Oct. 4-6

National Rural Water Association H2OXPO, Louisville, Ky. Visit www.nrwa.org.

Water Environment Federation WEFTEC 2011, Los Angeles Convention Center, Los Angeles. Visit www.weftec.org.

American Society of Civil Engineers Annual Civil Engineering Conference, Memphis, Tenn. Visit www.asce.org.

Oct. 23-25

American Water Works Association International Forum on Stormwater Management in Urban Areas, Sherbrooke, Quebec, Canada. Visit www.awwa.org.

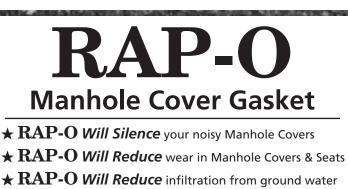
Oct. 31-Nov. 3

National Association of Flood and Stormwater Management Agencies Annual Meeting, St. Petersburg, Fla. Visit www.nafsma.org.

Nov. 7-10

American Water Resources Association Annual Water Resources Conference, Hyatt Regency, Albuquerque, N.M. Visit www.awra.org.







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HOBAS Pipe's Mele Receives Croft Award

INDUSTRY NEWS

John Mele, area manager North Atlantic Region for HOBAS Pipe USA, received the 2011 Harry P. Croft Award, presented annually to a member of the New Jersey Water Environment Association (NJWEA) for outstanding service to the association or the field of water pollution control. He has been an NJWEA representative to the Water Environment Federation



(WEF) House of Delegates, served as president of the Central Section of NJWEA, serves on state level committees with NJWEA and is a member of the New York Water Environment Association (NYWEA).

Synagro Acquires Drilling Solutions

Synagro Technologies Inc. acquired Drilling Solutions LLC of Lafayette, La. The acquisition provides Synagro access to the oil and gas sector, leveraging the company's dewatering expertise. Additionally, the acquisition aligns closely with Synagro's centrifuge repair business, Hypex, and allows Drilling Solutions to improve operating efficiency of its closed-loop dewatering systems. Mark Guidry will be general manager of Synagro Drilling Solutions.

Aquatech de Las Americas Launches Website

Aquatech de Las Americas, subsidiary of Hi-Vac Corp., launched a new website, www.aquatechdelasamericas. com. Headquartered in Bogota, Columbia, Aquatech de Las Americas is a sales, service and training com-



pany specializing in sewer cleaning equipment.

ClearSpan Partners with AgriLab Technologies

ClearSpan Fabric Structures, a division of ESAPCO, partnered with AgriLab Technologies, specializing in heat capture and transfer from aerobic composting. The company's ISOBAR technology moves heated vapor, averaging 120 to 150 degrees F, produced by the composting process across closed-loop, gas-charged tubes to collect and capture heat. ◆



If You Purchased Municipal Derivatives from January 1, 1992 to the Present

You Could Get a Payment from a Class Action Settlement

A partial Settlement has been reached with Morgan Stanley, one of the Defendants, in a class action lawsuit alleging bid rigging in the sale of municipal derivatives. The case, In re Municipal Derivatives Antitrust Litigation, MDL No. 1950, No. 08-02516, is pending in the United States District Court for the Southern District of New York.

Who Is Included in the Settlement?

This Settlement includes all state, local and municipal government entities, independent government agencies and private entities that purchased:

- (a) By negotiation, competitive bidding or auction municipal derivatives directly from an Alleged Provider Defendant or Co-Conspirator, or through an Alleged Broker Defendant or Co-Conspirator,
- (b) Any time from January 1, 1992 through the present in the U.S. and its territories or for delivery in the U.S. and its territories.

The Alleged Provider and Broker Defendants and Co-Conspirators are listed on the website referenced below.

What Does the Settlement Provide?

The Settlement affects only the claims against Morgan Stanley. The case is continuing against the other non-settling defendants. Morgan Stanley has paid \$4,950,000 for the payment of claims, plus an additional \$1,550,000 to pay certain administrative and litigation costs. Morgan Stanley will also provide information to the attorneys for the Class and cooperate in connection with claims against the non-settling defendants.

What Do I Do Now?

• Remain in the Settlement. To remain in the Settlement Class and participate in the Settlement, you do not need to do anything now. If the Court approves the Settlement, you will give up the right to sue Morgan Stanley for the claims in this class action. To receive a payment, you will have to submit a claim form that will be available at a future date. Register on the website to receive a claim form when it becomes available. If you remain in the Settlement Class, you will still have the right to exclude yourself from any other class that may be certified in the case.

- Exclude yourself from the Settlement. If you do not want to remain in the Settlement Class, you must exclude yourself. You must send a written request for exclusion by first-class mail, postmarked no later than October 11, 2011. If you exclude yourself, you cannot participate in the Settlement, but you retain your right to sue Morgan Stanley on your own for the claims in this lawsuit.
- Object to or comment on the Settlement. If you remain in the Settlement Class and want to object to or comment on the Settlement or any of its terms, you must file an objection with the Court and deliver a copy to Class Counsel and Morgan Stanley postmarked no later than October 11, 2011.

Who Represents You?

The Court has appointed the law firms of Hausfeld LLP; Boies, Schiller & Flexner LLP; and Susman Godfrey LLP to serve as Class Counsel and represent all members the Class. If you want to be represented by your own lawyer, you may hire one at your own expense.

When Will the Court Decide Whether to Approve the Settlement?

The Court has scheduled a hearing on November 23, 2011, at 9:30 a.m. at the U.S. District Court for the Southern District of New York, 500 Pearl Street, New York, NY 10007. The Court will consider whether to approve the Settlement as fair, reasonable and adequate, and whether to apwrove Class Counsel's request for reimbursement of litigation expenses.

You or your lawyer may ask to appear and speak at the hearing but are not required to. If you want to be heard by the Court, you must, no later than October 11, 2011, file a written request with the Court and deliver a copy to Class Counsel and Morgan Stanley. The Court may change the time and date of the hearing. Any change will be posted on the website.

For more information on this lawsuit, your rights, or to obtain a list of defendants, call or go to the website shown below or write to Municipal Derivatives Settlement, c/o Rust Consulting, Inc., PO Box 2500, Faribault, MN 55021-9500.

For more information: 1-877-310-0512 www.MunicipalDerivativesSettlement.com



Product Spotlight Loading System Adds Precision to Pipe Fusion Process

By Ed Wodalski

he MegaMc PolyHorse pipe-handling system from McElroy is designed for use with a pipe fusion machine and 20- to 48-inch polyethylene pipe. The system has a capacity of 70,000 pounds and a maximum pipe weight of 10,500 pounds.

It combines a series of inclined racks that gravity-feed pipe to the dispenser. Pipe length is dispensed to the incorporated roller pipe stand, and a second, rubber-tracked pipe stand feeds the pipe axially into the fusion machine. All work is done hydraulically (20-gallon hydraulic reservoir, 3 gpm/ 2,500 psi) and controlled from a single tethered remote.

"If the pipe has been sitting on the ground, in the sun, it can curve," says Brandon Jackman, project engineer. "So each pipe may be a little different, and a fixed pipe stand would have to be adjusted for each pipe." With the hydraulic system, the pipe fusion machine operator can adjust the pipe stand 24 inches laterally and 36 inches vertically for proper alignment.

The system is designed for a once-per-day loading operation. Pipe is unloaded onto steeltube racks. "The idea is that you have a full shift's worth of work on the racks," Jackman says.

The pipe racks act as a giant magazine with three-position dispenser arm (20- to 24-inch, 26- to 36-inch and 42- to 48-inch pipe) that enables the operator to feed, align and hold a stick of pipe for the fusion process. The automated system eliminates a second operator, trackhoe or

other equipment to align, load and hold the pipe in place. "Everything is powered from one hydraulic power unit on the tracked pipe stand," Jackman says.

Safety is another factor. "It's eliminating some of the hazards of loading the pipe by a trackhoe or front-end loader," Jackman says. There's also less wear on the fusion machine.

The six-piece system consists of a track pipe stand, roller pipe stand, and four rack components. The package, along with the fusion machine and generator, fits on a flatbed semi-trailer.

The area needed for operation depends on the length of the pipe — typically 40- and 50-foot lengths. Depth is determined by the number of racks used. "Ideally you would use both sets of racks (39 feet) so you could get more pipe on," Jackman says. "If you are limited by space, you can use just one set of racks (25 feet)."

The system can be unloaded and installed in less than an hour. It can be paired with any MegaMc fusion machine as well as TracStar 500, 630 and 900 machines. 918/836-8611; www.mcelroy.com/fusion.

Blue-White Offers **DIGI-METER** F-2000 Series Flowmeter

The BW DIGI-METER F-2000 series electronic



insertion-style flowmeter from Blue-White Industries is made for monitoring flow in municipal water and wastewater. The clamp-on saddle fitting and insertion sensor are quickly installed on IPS (ASTM D1785) pipe sizes from 1 1/2 through 12 inches and metric (DIN 8062) pipe sizes from 50 mm through 315 mm. The electronic display and communication enclosure can be mounted directly to the sensor, or remotely mounted to a pipe or panel. Standard models display flow rate and accumulated total flow, and include NPN open collector output for communication with data loggers, SCADA systems and other external devices. Optional 4-20 mA/0-10 VDC plug-in circuitry can be added for additional communication requirements. 714/893-8529; www.blue-white.com.

RIDGID Introduces TC-40 Pipe Cutter

The TC-40 plastic pipe and tube cutter from RIDGID is designed for cutting polyethylene (PE), polypropylene (PP), PEX, rubber hose, PVC and CPVC up to 15/8 inches outside diameter. A 75-watt motor drives the pointed X-CEL blade, providing a square, precise cut in four seconds. The pushbutton blade release allows for quick repeat cuts. The pipe cutter is powered by a detachable 12-volt

lithium-ion battery for up to 250 cuts per charge. The 2.5-pound cutter features an ergonomic pistol grip and LED light at the front of the tool. 800/769-7743; www.ridgid.com.

Bell & Gossett Introduces i-ALERT Pump Monitor

The i-ALERT condition monitor from Bell & Gossett provides an early warning of pending pump trouble. The monitor continually





measures the vibration and temperature at the pump power end and uses two red blinking LEDs to alert personnel when the pump exceeds preset vibration and temperature limits. The monitor also has a single green LED that indicates when the monitor is operational and has sufficient battery life.

847/966-3700; www.bellgossett.com.

Xypex Offers Crystallization Concrete Waterproofing

Crystallization concrete waterproofing from Xypex Chemical Corp. uses concrete's inherent water permeability to deliver crystalline



chemicals that plug the material's pores and bridge micro-cracks that occur as the concrete dries and shrinks, making it resistant to chemical attack, such as sulfuric acid. The sealant can be used on new concrete or applied as a surface coating to existing concrete. It is nontoxic, contains no VOCs and is NSF-61 approved for potable water by NSF International. 604/273-5265; www.xypex.com.

Reed Introduces Squeeze-Off Tools

PE Squeeze-Off tools from Reed Manufacturing Co. compress polyethylene (PE) plastic tube/ pipe to stop the flow of water or gas. Available in PES6 (3- to 6-inch diameter) and PES8 (3- to 8-inch) models. When used properly, the pipe will return to its original shape and normal flow rate.

> The tools reduce time spent looking for buried shutoff valves, reduce wasted water and gas and enable crews to restore service quicker. The "M" manual tools provide a clamping force after physically turning a

handle on a long screw. The "H" hydraulic tool uses a pump and cylinder for easier clamping. 800/666-3691; www.reedmfgco.com.

Red Valve Offers CheckMate Inline Check Valve

The CheckMate inline check valve from Red Valve Co. is designed for odor mitigation. In outfalls, stormwater, CSO and SSO applications, the valve's custom-engineered, all-rubber unibody design prevents sewer system odors from backing up, while allowing water to discharge as needed. Valves are available in 4- to 72-inch sizes. It is



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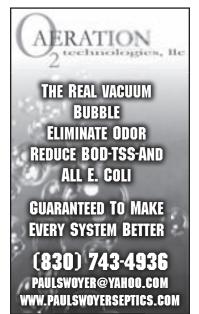




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TIME TO RECERTIFY?

PACP trainers and users need to be aware of new requirements for renewing certification and budget time and dollars accordingly

By Ted DeBoda, P.E.

n the April issue of MSW we told about NASSCO's plans to require recertification of the Pipeline Assessment and Certification Program (PACP) for trainers and users of the data. The subject is worthy of an update because the requirements are now in place, the modules have been updated, and it's time to inform all PACP trainers and users about the need to recertify.

Do you know the status of your PACP recertification? If not, contact NASSCO soon. But for now, here is what you need to know.

If you are a PACP user

PACP users must become recertified every three years (\$175 for NASSCO members and \$225 for nonmembers). You will receive a six-month notification of expiration by email, so please make sure

we have your current information.

Users can complete recertification online or through a Master Trainer. For online recertification training, you need to pass a proctored exam at a pre-approved location. Major changes and updates have been made to the PACP manual, so if your manual is older than version 4.43 (released in June 2010), you will need a new one (version 6.0, \$100 plus shipping) for recertification. If your version is 4.43 or newer, you can download free updates in the Manual Updates section of www. nassco.org.

If you are a PACP trainer

Your skills will be tested every 18 months (\$275). In the past, NASSCO offered trainers automatic recertification based on the number of classes taught. We now have a comprehensive application

process and a more structured syllabus to lead you through the program.

You will be asked to review the online recertification modules and take the written knowledgebased exam before attending an in-class evaluation by a NASSCOcertified master trainer who will evaluate your ability to lead, educate, encourage and instill knowledge among a class of 10 participants. You may also be required to submit a coded video for review before being accepted for training.

Be prepared

We want to ensure that cities and organizations budget for user recertification and are not caught off-guard. NASSCO's mission to set industry standards for the assessment and rehabilitation of underground pipelines, and to assure the continued acceptance



and growth of trenchless technologies, relies on maintaining the highest integrity of data.

This requires an investment in training time and costs to ensure the best possible outcomes. While the cost of recertification and, in some cases, updating of manuals, is something that must be budgeted, the online portion will allow users to refresh their PACP knowledge without travel or other expenses.

For more information or to inquire about your recertification status and requirements, contact NASSCO at info@nassco.org or 410/486-3500. ◆

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

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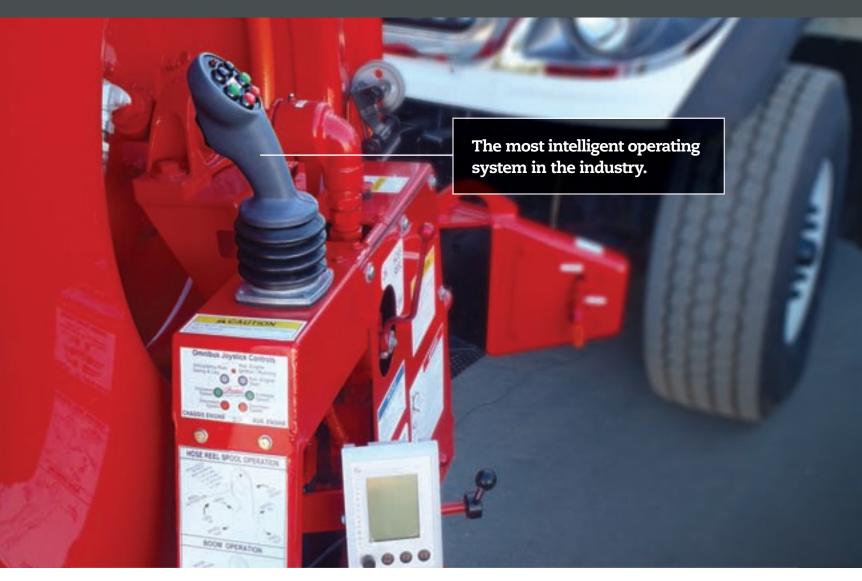
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