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MOVING FORWARD IN MOOSE JAW

Canadian utility is spearheading
an infrastructure renaissance
that includes replacing a third
of its water mains

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Josh Mickleborough,
Director of Engineering
City of Moose Jaw,
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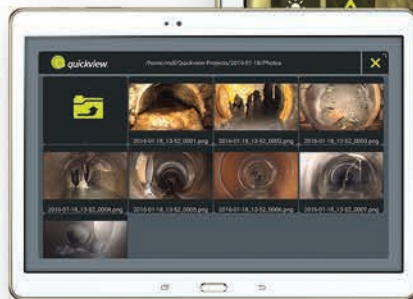
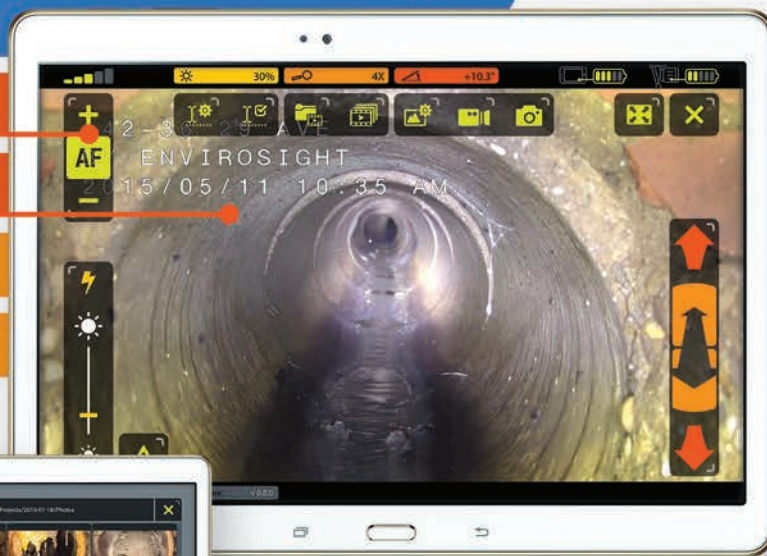
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INSIDE:

LOCATION AND LEAK DETECTION



ON THE COVER: Moose Jaw Director of Engineering Josh Mickleborough oversees a water main excavation in Moose Jaw. The city is replacing a third of its water mains. (Photography by Andy Hamilton)



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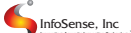

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... TIME MARCHES ON

Plans don't matter when new opportunities — and obstacles — present themselves



FROM THE EDITOR

Luke Laggis

Time can move painfully slow in specific instances, and the more you focus on the specifics, the more likely you'll be to realize — when you eventually stand back — that weeks, months, years have passed.

I sat down to write this column on Monday, Sept. 12, the day after the 15th anniversary of the attacks on the World Trade Center. I remember pieces of that morning so vividly that it's almost impossible to believe how many years have passed in the interim. I was driving down County Highway PD on my way to work at a small newspaper in southern Wisconsin when I heard on the radio that a plane had crashed into the first tower. There was no mention of terrorism.

When I got to work I learned about the second plane. We spent a lot of time in the conference room that day, staring at the TV in disbelief.

That was my first newspaper job. I left there in 2003 to move home and take care of my mom, who'd just been diagnosed with terminal cancer. In

the years since, I've run a family business, worked for other newspapers, bought my first and second house, got married, got divorced, and jumped into the water and wastewater industry. So much has happened, none of it planned, but I like where I'm at today.

What do you remember from 15 years ago? Are you in the position now you hoped to be? Is your utility? Maybe you wanted to replace all of the clay pipe in your collections system and you only did 50 percent. Maybe you wanted to upsize 10 miles of water main and you did 25. It's good to plan and have goals, but you can't plan for everything and you never know (my apologies for the cliché) what tomorrow will bring. How you adjust and adapt will ultimately tell the tale of your life and your utility.

The city of Moose Jaw, Saskatchewan, had become focused on the day-to-day, delaying capital projects and spending \$1.7 to \$2 million per year on 40 to 50 water main breaks, mostly centered around cast iron pipe. But the utility has its eye on the future now, with a 20-year plan to replace 50 miles of cast iron pipe, concentrating first on the sections demonstrating high break frequency.

City Manager Matt Noble says the replacement program may be the best program the city has ever delivered. And it's serving as a catalyst for other initiatives. In addition to planning for the replacement of a 12-mile transmission line, the utility is looking at establishing a valve exercising program and re-establishing a water main flushing program.

Recognizing opportunity and acting on it is the key to success. You never know which project might transform your utility, and you'll never build a better tomorrow for your utility if you continue to operate in a reactive mode without ever stepping back to consider the future.

So embrace each day, and take full advantage of the opportunity it presents.

Enjoy this month's issue. ♦

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

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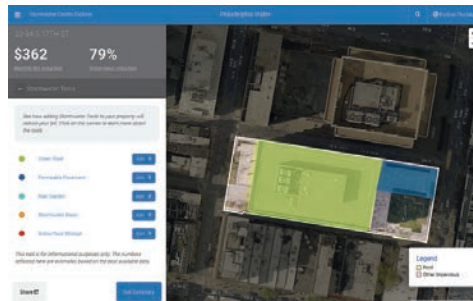
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WHAT'S IN THE GROUNDWATER?

USGS Study Shows Changes in Contaminants Over 25 Years

Nearly half of the U.S. population relies on groundwater as a drinking water source. That's more than 140 million people, and about 45 million of that group draw groundwater through private wells — sources particularly vulnerable to contamination since they aren't subjected to the same standards as public water utilities. Groundwater quality is important to the nation, and that's where recent data from the U.S. Geological Survey comes into the picture. mswmag.com/featured



THERE'S AN APP FOR THAT

Philly Property Owners Virtually See Impact of Green Infrastructure

Philadelphia has been striving to reduce stormwater runoff in the city. Helping that effort is the Credits Explorer app, which allows users to virtually add green stormwater infrastructure to their properties and see what savings they would realize on their monthly bill if they actually followed through and installed such measures. mswmag.com/featured

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THE REAL WORLD

Rhineland Project Helps Educate Student Interns

Managing a project as large as the Rhineland Downtown Streetscape Project can be a daunting task for any engineering firm, and it's been no different for Town & Country Engineering this past summer as it's overseen the project. Instead of bringing on other full-time engineers to assist, the firm opted to go a different route: college students needing real-world experience as well as college credits. mswmag.com/Rhineland



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A CAREER BUILT ON GOOD ADVICE

David McAlpin goes from university to utility and builds a life around water and wastewater in Blountsville, Alabama

By Jack Powell

David McAlpin is proof that the adage “Listen to your elders” pays off. As general manager of the Blountsville (Alabama) Utility Board, McAlpin has found a niche that has served everyone well — himself, his wife and three children, and this quiet community of 1,700 in northwest Alabama.

So well that in March 2015, McAlpin was named Wastewater Operator of the Year by the Alabama Rural Water Association. “I sure was surprised when I won the award,” says McAlpin, 40, a 17-year water and wastewater veteran. “I told people there must have been only one person under consideration for me to have won.”

“I’ve been a member of the ARWA for many years. It’s a great organization and an excellent resource for water and wastewater information. I’ve even had ARWA members come up here to do testing on our sewer system, go to our wastewater plant and tell us what we need to do to stay in compliance, and on the water side, conduct leak surveys to help us keep water levels under control.”

Great opportunity

How a Blountsville native and former high school basketball star came to run the town’s water and wastewater systems is an example of seizing an opportunity and driving for the hoop. It also shows how hard work, commitment to learning and passion for providing clean, safe water can produce a rewarding career.

After graduating from J.B. Pennington High School, McAlpin attended Wallace State Community College in nearby Hanceville, Alabama, and earned an associate degree in liberal arts. Then he enrolled in Athens State University, the state’s oldest institution of higher learning, founded in 1882, on a full basketball scholarship. Finding himself burned out on school after five years, he left the scholarship on the table — “I know it sounds crazy” — and came to the utility. He started the next day as a trainee.

“My uncle told me that I needed a good, steady job that would pay me a living and benefits, so I became a wastewater operator,” says McAlpin, who holds Grade 1 Wastewater and Grade 2 Water certifications. “I’m real glad I listened; it was the best advice I ever got. I learned the business and moved up to superintendent and eventually general manager, while providing for my wife and kids, so it’s been a big win all around.”

(continued)

David McAlpin, general manager of the Blountsville Utility Board, was the Alabama Rural Water Association’s 2015 Wastewater Operator of the Year. (Photography by Jeff Haller/Keyhole Photography)

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Blountsville Utility General Manager David McAlpin excavates a water main while Lynn Goble and Jeff Floyd wait to install a new tap for a customer.



PROFILE:

David McAlpin,
Blountsville (Alabama)
Utility Board

POSITION:

General manager

EXPERIENCE:

17 years

DUTIES:

Oversee water/wastewater operations;
supervise operators and office staff

EDUCATION:

Associate degree, Wallace State
Community College

CERTIFICATIONS:

Grade 1 Wastewater Operator license;
Grade 2 Water Operator license



David McAlpin (left) and Lynn Gobles connect a fitting on a new waterline.

Permit issues

On the water side, McAlpin and his two Grade 2 operators are responsible for two well houses that together pump about 500,000 gpd; all they do is add chlorine. The wastewater operation is a three-pond aerated lagoon system built in 1986 and staffed by a Grade 1 operator. Flow averages 300,000 gpd, and effluent discharges to Blue Springs Creek.

McAlpin's major challenges include keeping up with changing permit requirements set by the Alabama Department of Environmental Management. He's on his fourth discharge permit. The process provides secondary treatment. McAlpin's team checks the ponds for sludge buildup quarterly.

Five years ago, McAlpin began to shine when Blountsville encountered some difficult noncompliance issues. When the town received a consent order over its sewer system, officials asked McAlpin to correct the situation and get the town back into compliance. But the fixes weren't working as fast as the Alabama Department of Environmental Management thought they should. That's when McAlpin reached out for help from other

utilities in the area and hired a consultant knowledgeable about sewer systems, particularly lagoons.

"David worked with them and never let up or ever gave up until we were in compliance," says Bobby Griffin, vice chairman of the five-member Blountsville Utility Board, which supervises McAlpin and sets his \$1 million annual budget. "Those are just some of the things David and his crew

(continued)

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“My uncle told me that I needed a good, steady job that would pay me a living and benefits, so I became a wastewater operator. I’m real glad I listened; it was the best advice I ever got.”

– David McAlpin



Lynn Gobles (left) and David McAlpin connect extension tubes to the vacuum boom on a Vac-Con jet/vac truck at the start of a sewer cleaning job.

did to get us back on track. To date, we’ve been in compliance for 26 straight months of testing with our lagoons. That’s one of the reasons he was nominated and unanimously chosen as Operator of the Year.”

Permit issues also govern chlorine use at the wastewater plant. “We were using chlorine to meet our *E. coli* parameter, but our permit allows only so much chlorine, so we had to take some of it out before we discharge the water into the receiving stream. We used that method until Dec. 8, 2015, when we put in what to our knowledge was the first and only UV equipment (WEDECO – a Xylem Brand) to be used on the back side of a lagoon system anywhere in the state. It has worked great!”

Attacking I&I

Like many wastewater operations, Blountsville has struggled with inflow and infiltration. Here, McAlpin’s determination and commitment has produced impressive results. In 2014, McAlpin and his team found a severe offset in a sewer line and discovered groundwater pouring into an 8-inch sewer main.

Compounding the problem, many of the lines were installed in the 1940s when I&I wasn’t a priority. McAlpin and his operators used a CCTV camera to inspect the lines and deployed flowmeters in high-flow areas, ultimately finding three major infiltration points. They then patched the lines and fixed leaky manhole covers. In doing so, they reduced infiltration to the treatment plant by 11.5 million gallons per year.

“I&I is just one example of the outstanding job David does for us,” says Griffin, who has served on the board for seven years after retiring from a local water authority. “David is well-versed in all aspects of our water, wastewater and sewer operations. When things don’t go the way they should, he knows just what to do and helps us on the board understand the rules and regulations we need to enforce.”

Keeping it flowing

McAlpin had his mettle tested in late August 2015 when silt began showing up in Blountsville’s main waterline. It was the first time the town had encountered such a problem, and even retired water operators were puzzled.

“One of the wells pumped 800 gpm, and the other pumped 300 gpm,” says McAlpin. “With that kind of flow, being offline can really set you back, especially for a small town like ours. We really needed to get on top of the problem in a hurry.”

With the water supply threatened, McAlpin and his team swung into action. They quickly tied into the system from nearby Brooksville to keep the water flowing. Next, McAlpin and the utility board brought in well experts who pumped out

MORE THAN A DAY'S WORK

David McAlpin starts his day with the Blountsville (Alabama) Utility Board at 7 a.m., typically meeting with the operators to discuss what needs to be done. His shift ends at 3:30 p.m., but that's not the end of his work.

When he's not at the utility, McAlpin works with his father, who runs a 400-acre farm 3 miles from Blountsville, named for Gov. Willie G. Blount of Tennessee, who helped settlers in Alabama during the Creek War of 1813-14. They raise cattle and maintain four poultry houses.

McAlpin often puts in three or four additional hours a day there because there's always something to do on a farm that size. He doesn't mind because it's the family farm he grew up on. Not long after getting married, he bought some additional land and built a house on it. Fortunately, McAlpin is a high-energy type and he enjoys being tied to the land as much as the water.

the silt, which had built up in a well cavity for many years and got high enough in the hole that the suction from the pump began to pick it up. The 800 gpm well, dug in 1964, went down 105 feet and was completely offline. A big crane lifted out the pump, which was installed in 1997, and McAlpin's crew did extensive maintenance and repair.

"Dealing with the wells was a big job for David and his team," Griffin says. "They worked long hours making sure that everything went right, tying these other lines in so our customers never missed a beat when it came to their water. Best of all, our customers never knew what happened. We kept providing clean, safe drinking water. When something bad happens, you have to respond right then, because people expect to have water when they turn on their faucets. That's just what we did."

Making progress

While there have been no major facility expansions during McAlpin's tenure, Griffin points out the many modifications made to the water and wastewater system during that time. They include adding a bar screen at the headworks in 2008 and installing a fourth lift station in 2010.

Those are significant projects for a small utility that serves 1,415 water and 815 sewer customers. For the past 10 years, the utility has also had three sewer grants of about \$400,000 each to support the collections system.

In addition, McAlpin has purchased a sewer camera and a vacuum truck, which the crew uses

for regular maintenance. He and his crew work to find problems and map them in the utility's GIS, which displays a map of the sewer and waterlines. They put all that information into a maintenance plan where work is prioritized.

"He's out there with them and coordinates things at the same time," Griffin says. "It's not unusual for him to come by for a quick meeting and take five or six phone calls; sometimes it seems as if he's run ragged keeping everything afloat."

Despite the heavy workload, McAlpin considers himself lucky to have landed his ideal job. "I had no intention of getting into the water and

wastewater business," he admits. "In fact, I thought it would be a transitional job until I found what I wanted. But then I fell in love with it, and when people retired I was able to move up. If you're up to the challenge, water and wastewater are great careers. Every day you learn something new." ♦

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A QUICK LOOK AT YOUR PIPES

Envirosight's new zoom camera provides utilities with a powerful assessment tool

By Luke Laggis

Zoom assessment allows utilities to get a quick picture of what's happening in their pipes and target further inspection accordingly. It's an effective tool that can save time and money.

Envirosight launched its first zoom assessment camera 15 years ago. In the years since, inspection camera technology has advanced tremendously. The new Quickview airHD represents many of those advancements, along with some of Envirosight's own technological improvements.

What was the idea behind the design of this camera system?

Municipalities need a tool that provides a quick, affordable assessment of sewer condition. Camera crawlers are just too costly and time-consuming to deploy in every situation, so zoom assessment tools like the Quickview airHD serve as a front-line strategy for rapidly determining whether a pipe is in good shape, or whether it needs additional CCTV crawler inspection or cleaning.

What issues does this resolve over previous pole camera systems?

Since we launched the industry's first zoom assessment camera 15 years ago, municipalities and contractors have really embraced the zooming concept. Naturally, many inspection camera manufacturers have followed us into the market with similar products.

We wanted the next generation of our Quickview product to make leaps in efficiency and detail, so we approached R&D with a focus on both usability and quality of the deliverable. As a result, the new Quickview airHD offers a combination of features no other zoom survey camera does, including:

- **Real-time wireless control and video streaming**, so setup is dramatically simplified and operation is highly intuitive.
- **HD video** to capture detail far greater than

any other zoom assessment camera currently available.

- **Remote height and tilt adjustment**, which allows an operator to attain optimum view alignment quickly without extracting the pole.
- **Hands-free operation**, where stabilizer legs keep video perfectly steady, allowing the operator to focus on the footage observed.
- **Touch-screen tablet controls**, which offer the operator a familiar device interface at a consumer price point, while providing a platform to exploit the most advanced wireless and HD video technologies.

Beyond these innovations, the design of the Quickview airHD still incorporates our patented Haloptic light engine, which projects shadowless illumination that's perfectly aligned with the camera's view axis to achieve maximum inspection range.

Is this a front-line initial assessment system, or can it fill the role of a crawler system for a smaller utility that doesn't do a ton of inspection?

Quickview airHD doesn't replace a crawler, it helps municipalities use their crawlers more wisely. The majority of sewer lines don't need full CCTV inspection, and a preliminary assessment with a zoom camera can identify those lines. Whether you have inspection capability in-house or contract it out, reducing your crawler inspection workload is a big time- and money-saver — the PASS Program estimates up to 34 percent reduction in costs and 17 percent boost in productivity for a systemwide assessment.

How do the centering foot and positioning system work?

Zoom assessment works best when the camera looks down the centerline of a pipe. The Quickview airHD's new patent-pending foot incorporates a ratcheted gas-spring mechanism that makes cen-



Envirosight's new Quickview airHD zoom assessment camera serves as a front-line strategy for rapidly determining whether a pipe is in good shape, or whether it needs additional CCTV crawler inspection or cleaning.

terline positioning easy. The operator pushes down on the pole (against the spring) to lower the cam-

(continued)

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The Quickview airHD captures HD video at up to 400 feet in favorable conditions.

era to the desired height. The ratchet holds the position. If the operator overshoots, pushing the camera to its lowest extent will release the ratchet, resetting the camera to maximum height. Extracting the camera from the hole to adjust foot height is no longer required.

What is the camera's effective range?

Viewing range depends on size, material and condition of the pipe, but under favorable circumstances the camera sees as far as 400 feet.

Is there a way to determine the exact distance/location of a defect?

Quickview's role is to identify sewer lines where defects warrant further inspection with a camera crawler, so the position of any defects (in lines where they exist) will ultimately be measured by a crawler. Still, an operator can count pipe segments to determine approximate distance to an observed defect.

What benefits does wireless operation provide?

Its wireless design means fewer setup steps, less clutter around the manhole, and improved safety. In addition, cables are a wear item, so eliminating the cable removes a potential failure point.

How is the recorded footage stored and shared?

Quickview airHD captures video and still images to device memory as industry-standard MPEG and JPEG files, respectively. From there, depending on the tablet device, you can share them as you would any other media: by email, text or cloud storage, or by transferring them via removable media or tethering to a laptop or desktop computer. The Quickview airHD app is available for Android tablets, iPads and Windows tablets and laptops.

Can footage be reviewed on a laptop or desktop so text can be added on a real keyboard, or is the Wi-Fi client function intended to serve the sharing role?

As just mentioned, footage can be transferred to a laptop or desktop computer via removable media or device tethering. Once on the computer, it can then be shared or merged into cloud-based inspection reporting software like WinCan VX. Quickview airHD also has built-in text overlay capability, so custom captions (including dynamic data like GPS position, camera inclination and date/time) can be added directly to video and still images. ♦



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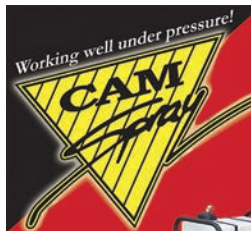
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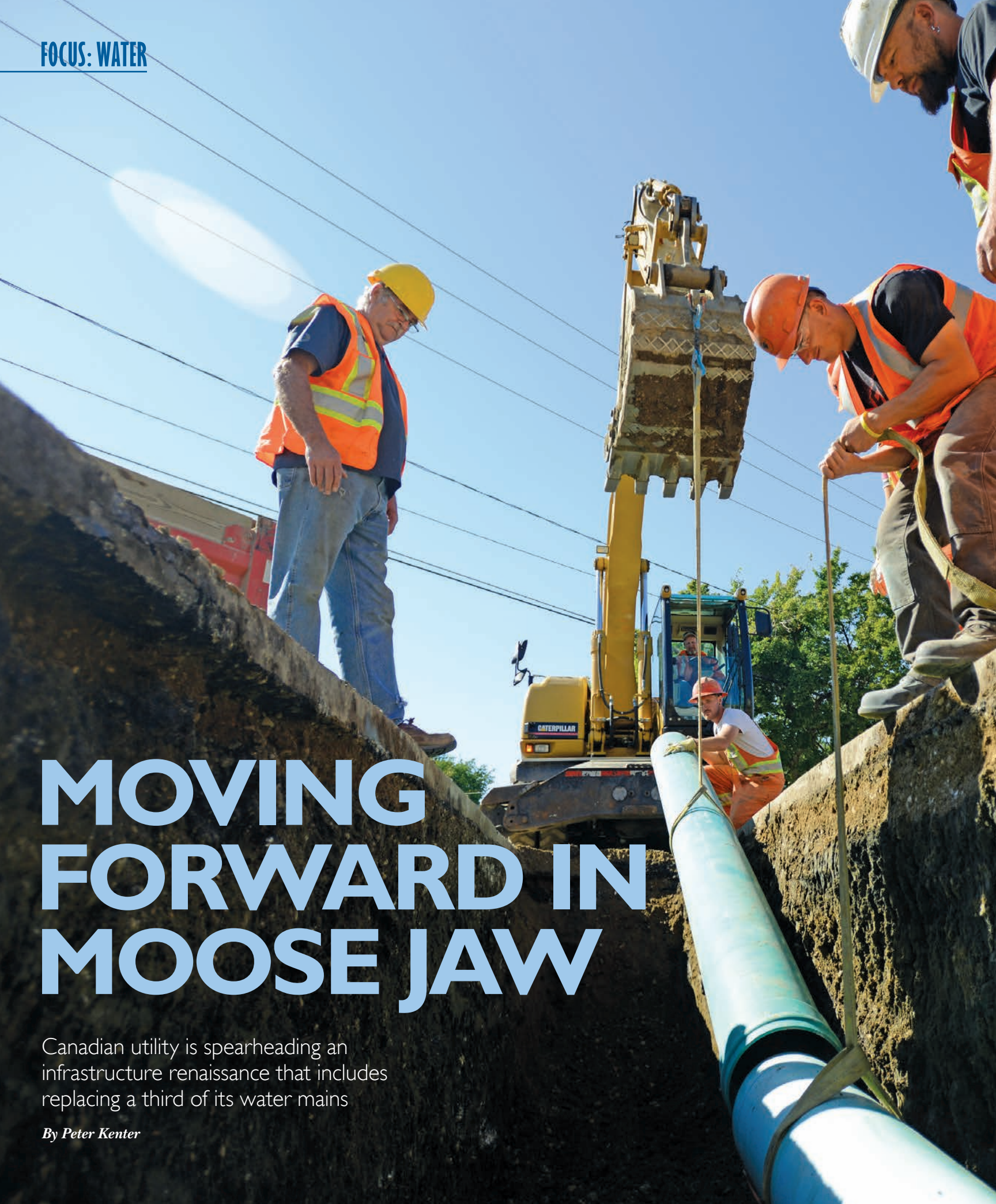
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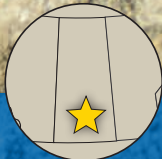
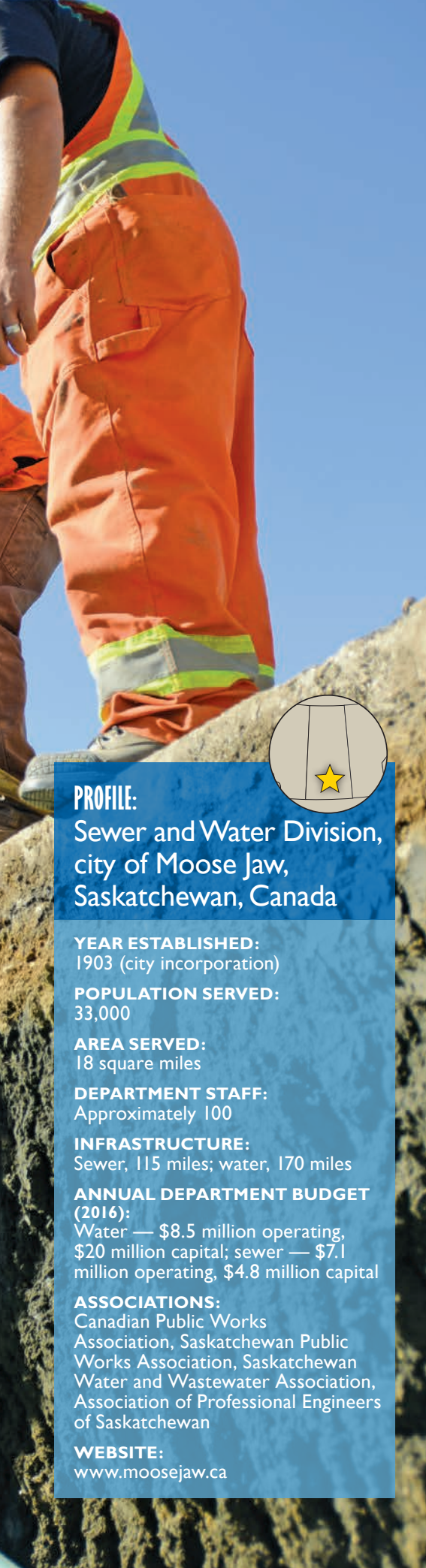
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MOVING FORWARD IN MOOSE JAW

Canadian utility is spearheading an infrastructure renaissance that includes replacing a third of its water mains

By Peter Kenter





PROFILE:

**Sewer and Water Division,
city of Moose Jaw,
Saskatchewan, Canada**

YEAR ESTABLISHED:
1903 (city incorporation)

POPULATION SERVED:
33,000

AREA SERVED:
18 square miles

DEPARTMENT STAFF:
Approximately 100

INFRASTRUCTURE:
Sewer, 115 miles; water, 170 miles

ANNUAL DEPARTMENT BUDGET (2016):
Water — \$8.5 million operating, \$20 million capital; sewer — \$7.1 million operating, \$4.8 million capital

ASSOCIATIONS:
Canadian Public Works Association, Saskatchewan Public Works Association, Saskatchewan Water and Wastewater Association, Association of Professional Engineers of Saskatchewan

WEBSITE:
www.moosejaw.ca

“We were getting anything from leaks to circle breaks to complete blowouts of the entire pipe wall. Those breaks were also affecting the life expectancy of other infrastructure including roads and sidewalks. It was just throwing money into the ground.”

– Josh Mickleborough

The city of Moose Jaw, Saskatchewan, is focused on infrastructure renewal. For the past three years it’s been prioritizing its infrastructure needs, from roads and sewer systems to its water network. The city started with its hardest sell first — the replacement of 50 miles of cast iron water main nearing the end of its service life at a cost of about \$117 million over 20 years.

The city of 33,000 is located about 50 miles west of the provincial capital of Regina and 100 miles north of the Montana border. It’s an important transportation hub, with an economy rooted in industry, resources and agriculture.

Josh Mickleborough, director of engineering with the city, has worked across Canada on everything from sewer projects to asset management system upgrades.

“Having a family brought me to Moose Jaw,” he says. “But the other thing that drew me was a senior management committed to infrastructure renewal. Water is one of the most vital systems supporting the city — as water goes, so does the community.”

The water system dates back to the turn of the 20th century when the city tapped into an artesian well to the east and built 5.5 miles of potable water pipe.

“Over the years, we’ve seen steel, cast iron, asbestos cement and PVC,” says Mickleborough. “Depending on the application, we now prefer PVC or HDPE.”

Pipe diameter ranges from about 3 to 30 inches for transmission mains.

Recent cast iron a problem

“It isn’t the oldest pipe that’s causing us the headaches; it’s the cast iron pipe installed in the 1950s and 1960s that’s the issue for us now,”

Kurtis Okoktoks (center) and Clayton Hall use tow straps to help position new stormwater pipes in a trench along Caribou Street in Moose Jaw, Saskatchewan. (Photography by Andy Hamilton)

Mickleborough says. “Whether it was a change in the manufacturing process or quality of the pipe, it’s leading the pack on leaks and breakage. When a city bus got stuck to its axles in the pavement due to a main break, it illustrated the severity of what we were facing.”

Neighboring Regina, which shares the Buffalo Pound Water Treatment Plant with Moose Jaw, replaced its cast iron pipe more than 20 years ago.

City manager Matt Noble arrived in Moose Jaw in 2013 with a mission to upgrade the city’s infrastructure.

“When I came on we were about four years behind in delivering capital programs,” he says. “Previous councils had given us money but we were unable to attract contractors and resources to the community to accomplish them. We were able to change policies and bylaws that gave us the authority to make decisions that would move those programs forward. We also leveled the playing field on our bidding system to encourage a wide variety of contractors, both local and out of town, to offer bids.”

Noble notes that it’s not only sewer and water systems that are on the table. The city is looking at everything from enterprise software to roads, parks and recreation and historical buildings.

“We want to deliver those improvements in an efficient holistic fashion, not on an ad hoc basis,” he says.

Noble says the city was spending \$1.7 to \$2 million per year on 40 to 50 water main breaks, mostly centered around cast iron pipe. Breaks had become more frequent in recent years, in part because unusually heavy rainfall had saturated the semi-arid soil, driving frost down to the pipes.

Repairs ate up budget

“We were getting anything from leaks to circle breaks to complete blowouts of the entire pipe wall,” Mickleborough says. “Those breaks were also affecting the life expectancy of other infra-



“When a city bus got stuck to its axles in the pavement due to a main break, it illustrated the severity of what we were facing.”

– Josh Mickleborough

BUILDING A SEWER MAINTENANCE PROGRAM

Water main replacement is front and center for the city of Moose Jaw, Saskatchewan, but the city is also getting its sewer system into shape.

“As part of our infrastructure renewal program we’re currently completing a high-level assessment on the sewer system,” says Josh Mickleborough, the city’s director of engineering. “Right now it’s a mixture of city forces, contractors and consultants that are gathering condition assessment information.”

The sewer pipes are made of everything from clay tile to asbestos cement, concrete, cast iron and even steel — probably recycled from other purposes in the 1920s.

In some cases, sewer pipes were repaired poorly. In others, sections were replaced with undersized pipe, leading to flow restrictions. A cured-in-place pipe lining program is currently targeting the sections most in need of rehabilitation.

The city has owned a RapidView IBAK camera running PipeLogix software for four years. It’s mostly used to inspect blockages. The utility also owns a Vactor 2100 combo unit, but sometimes supplements the equipment by renting a VacHunter trailer vac by PipeHunter.

“Some of the pipes are 30 to 40 percent blocked with anything from sediment and grit to wonderful and surprising things like bags of bullet cases,” Mickleborough says. “We’re currently working to establish a systematic and consistent in-house televising and maintenance program.”

The current lining contractor has given in-house crews some ideas about ramping up the city’s root-cutting capability.

“The crews are requesting a better cutter and some new tools and tips from the equipment reserve budget,” Mickleborough says. “We encourage requests that provide our workers with the tools they need to do the job.”

Justin Fischer (left) watches as Clayton Hall uses a Stihl cutoff saw to cut a section of pipe for a new stormwater line.

structure including roads and sidewalks. It was just throwing money into the ground. Citizens were also complaining about the water quality caused by tuberculation.”

While various pipe rehabilitation methods were considered, the staggering number of failing service connections convinced the city that full replacement was the economical choice.

“Even giving those connections a jiggle might cause them to fail and require digging up the road,” Mickleborough says.

Educating the public

The engineering department also went into education overdrive, holding open houses and explaining the need for the program to citizens. On hand were samples of corroded and tuberculated pipe removed from the system.

City Council gave the green light to the 20-year plan to replace 50 miles of cast iron pipe, concentrating first on the sections demonstrating high break frequency.

“There was acknowledgment from the community that the program had to happen,” Mickle-

borough says. “It’s just how you pay for it that generated debate.”

The council-approved funding model for the program has been a hard sell. Under a Local Improvement Project funding model, homeowners whose mains are replaced pick up 30 percent of the cost. Residents can choose to pay a lump sum, or amortize the cost over 20 years.

“Council felt that since the residents get a brand-new street from curb to curb and the resulting increase in property values, these homeowners should contribute something to the project,” Mickleborough says.

The city is also offering a subsidized rate to completely replace sewer connections made of Orangeburg pipe and entire water service lines, many of which are still made of lead. “As a public health issue, eliminating lead is simply the right thing to do,” Mickleborough says.

During construction, the engineering department will also assess the conditions of sewers in the vicinity of the cast iron mains. (See sidebar.)

While in-house crews perform most of the repairs on sewer and water pipes, the larger construction projects — including the cast iron main project — are being contracted out.

Fleshing out GIS data

“We’re also using this program as part of our efforts to capture accurate GIS information for water infrastructure,” Mickleborough says. “There was a period in recent city history where map-



Pipefitter Mel Patoine measures a length of storm sewer pipe with Clayton Hall.

ping and recordkeeping was challenged. For example, we don't have any engineering information on 15 to 20 percent of our service connections. In another case we excavated a 500-foot length of what we thought was cast iron water main and found that it had been replaced 15 years ago."

The city is using ArcGIS (Esri) to capture GIS data.

Phase 1 of the residential work, which was just completed, encompassed 1 1/2 miles of water main and an additional length of service pipe totaling almost a mile. Water mains were buried as deep as 9 feet to place them below the frost line. The work also included replacement of all valves and hydrants.

The RFP for Phase 2 will go out in January, not only to ensure that contractors have time to sharpen their pencils, but also to ensure work starts early in the summer, maximizing work time before winter.

Meanwhile, the city is applying for federal funding to replace the original 12-mile steel water transmission line extending to the Buffalo Pound Water Treatment Plant. Built in the 1950s, the line is nearing the end of its service life. A project to complete the proper looping of various water mains is also on the table. That work was previously abandoned due to the difficulty of drilling underneath railroads, valleys and streams.

Mickleborough says the city is looking to re-establish a water main flushing program that was suspended around 2010 because it was driving

tuberculated water into the system, and also causing main breaks due to increased water pressure. The city is also establishing a valve exercising program, possibly its first. Work on these programs is also helping to drive data about priority areas for cast iron replacement.

"Although it costs money, the cast iron replacement program is probably the best program the city has ever delivered," Noble says. "We're enacting programs that will extend the service life of our infrastructure and ultimately make the city more efficient and less expensive to run." ♦

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GETTING BELOW THE SURFACE

Understanding potential challenges can help differentiate between malfunctioning tools and job site issues

By Kyle Rogers



It's easier to stay on your targeted utility in a congested environment if you start the locate in a less congested area. An understanding of soil conditions is also important. Dry soil is less conductive than wet soil and may produce a weak signal on the line being targeted.

Successful utility locating requires good equipment and better technique. When problems arise, fault may often lie with the person or job site conditions, not the equipment.

It's easy to mistake a job site problem for an equipment malfunction. "Bad depth." "Doesn't locate right." Those are the types of brief, vague descriptions that sometimes accompany McLaughlin locators that get sent in for repair.

When a locator is sent in for repair, the first thing service technicians do is conduct a physical test wherein the equipment is checked at three points; multiple frequencies and different modes are tested. An extremely high percentage of times, however, the testing reveals no issue, so the locator is sent back. The problem in these cases isn't the locator itself, but rather the user's understanding of the job site.

The following are McLaughlin's tips to help ensure the individual using the locator is armed with information to tackle any job site, and better understand when a problem is machine — rather than operator-based.

Effective locating begins with identifying potential issues and using the equipment properly. A locator is only as accurate as its operator, and we're all human and prone to human error.

Operators should hold locators straight up and down and keep thumbs relaxed (versus a tight grip) to ensure the locator is always hanging down. This allows the locator to move along a consistent, horizontal plane instead of shifting with the contours in the ground. Imagine a string line running along the top of the ground. The goal isn't to keep the bottom of the locator the same distance from the ground at all times, as the ground will shift height — the goal is to try to follow and keep the locator at the exact same height along the job.

After the operation is on point, the operator needs to ensure they are adjusting to the conditions of the job site accordingly. A tip for operators is to locate the utility line to a known point. An operator may be tempted to walk 50 feet from the connection point and say with certainty they have their line. "Trusting" versus testing this way can result in a lot of bad locates where an operator thought the utility was along their line, but the signal they were sending out was bleeding over to another utility.

It's best start a locate in an uncongested area. There is a tendency for people to focus on setting up in a congested environment, like near a telephone pole or utility box. Instead of setting up there, work to locate from an uncongested area and move toward the congested area.

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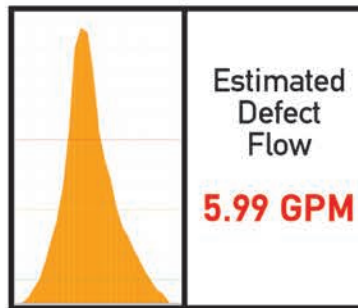
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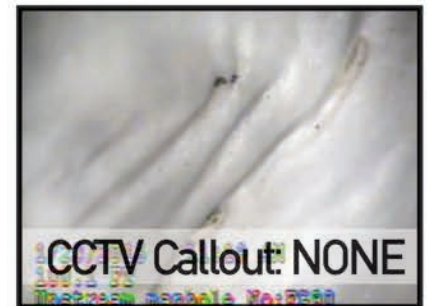
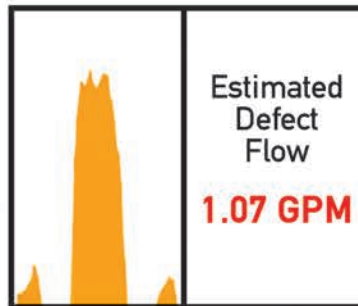
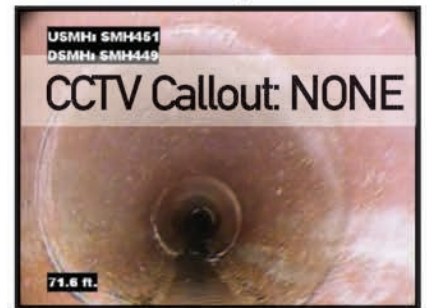
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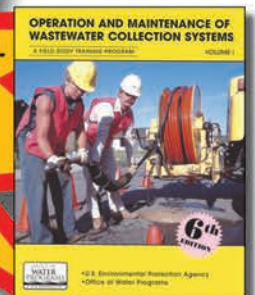


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Locators are designed to be held straight up and down so they can move along a consistent, horizontal plane — not according to the contours of the ground.

Effective locating begins with identifying potential issues and using the equipment properly. A locator is only as accurate as its operator, and we're all human and prone to human error.

Understanding soil conditions is another important element of a successful locate. Dry soil is less conductive than wet soil and produces a weaker signal on the line being targeted, creating a more challenging locate. That comes into play especially with sandy soils. If it recently rained, sand may work ok, but it drains very quickly so it may be necessary to use a different grounding element. Traffic or utility marking signs can serve as solid grounding elements. A sign can also prove helpful in highly resistant, frozen ground. If it sits below the frost line, it will take the condition from a high resistance to a wet, low resistance, a much better condition for the transmitter.

Develop an understanding of some of these finer points of locating and perhaps you won't find yourself sending the equipment back to the manufacturer, assuming that it's the source of your difficulties on a job site.

Combining knowledge of the tool with knowledge of how to locate will drastically increase the efficiency and success of the job. ♦



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YOU'VE GOT (TOO MUCH) MAIL

Implement these simple strategies for digging out of an unmanageable mountain of email

By *Ken Wysocky*

In Greek mythology, Sisyphus was condemned to keep rolling the same boulder up a hill, over and over again, for eternity. For many employees, handling email is an equally futile task — a never-ending avalanche of messages interrupted only by feeble and futile attempts at inbox management.

“The statistics are scary,” says Randy Dean, a time-management consultant (www.randalldean.com) who specializes in ratcheting up email efficiency. “On average, professional workers spend a little more than two hours a day just managing their email ... and check their inboxes 15 times a day. And nearly 25 percent of professionals check their inbox 20 or more times a day. They’re like Pavlov’s dogs responding to the ringing bell.”

As for the financial impact of inefficient email practices, estimates vary widely. One consulting group, Contatta, says shuffling emails around costs American businesses a staggering \$1.8 trillion a year. (That’s based on the following figures: A median wage of almost \$24 an hour, 637 hours a year spent on email per employee and 118 million workers using business email.)

The accuracy of that estimate is debatable. But one thing remains certain: While it may be difficult to quantify, inefficient use of email is a common workplace problem that stifles productivity and squanders valuable time, says Dean, the author of *Taming the E-Mail Beast: 45 Key Strategies for Better Managing Your E-mail Overload (and Regaining Your E-mail Sanity!)*. In fact, it’s probably dumbing down workers as well, according to one recent study that showed constantly checking email causes people to lose up to 10 IQ points. “You’re literally making yourself stupid,” Dean notes. “It greatly diminishes your ability to hold a cogent thought and act on it.”

Another study indicates it takes us as much as 20 minutes to regain our momentum at work after an interruption. Add all this together — not to mention meetings, texts, phone calls and social media — and you have what Dean calls a crisis in workplace focus. “Frankly, it’s amazing that anyone gets anything done,” he says. “I’m seeing a plague of this (constant distractions) in the organizations I work with.”

The irony here is that the very technology that was supposed to increase workplace productivity and make communication immensely easier has, in most cases, accomplished the exact opposite. But it doesn’t have to be that way, Dean suggests. “If we can get back to smarter and saner usage of email,

we can get back to the point we were at when email first came out in the late 1970s and early 1980s, when people thought this tool would help them get more work done better and faster. We can still do that — if we get some significant dysfunction out of the way.”

One of the biggest contributors to dysfunctional email practices is how employees manage their inboxes. At one of his recent seminars, Dean asked attendees how many messages they have in their inboxes. About 40 percent admitted they had more than 1,000 messages. Can you say “time suck?” Sure you can.

This efficiency-stifling accumulation occurs primarily because the average worker views the same emails anywhere from three to seven times, Dean says. That’s because after they open their inbox, they step onto an email treadmill where they read messages, decide they don’t have time to immediately deal with the issue at hand, then read it again a day or so later because they can’t remember what’s in it. Rinse and repeat, Sisyphian style.

“If you do nothing with an email after you read it, you’re wasting time,” Dean emphasizes. He suggests developing a “decision tree” in which employees don’t close an email until they’ve decided how to handle its contents. “Make a decision,” he urges. “That doesn’t mean you get that task done right away, but at least figure out what needs to be done the first time you look at the email.

“The second piece of this strategy involves doing quick tasks right away, the first time you see them in an email,” he continues. “There’s a ton of inherent logic here. If you’re not keeping the quick tasks moving along, they’ll bury you. It takes only 30 seconds to send a reply, as opposed to doubling or tripling the task by looking at it over and over.” Dean also suggests setting up folders by subject to keep emails organized into more manageable chunks — and evict them from the inbox.

Another strategy centers on developing a strict regimen for minimal email viewing. Just as dieters try to limit food intake, email addicts need to wean themselves off regular, habitual inbox checks. How many times you need to check email varies by job; those with client-centric, customer service jobs, for example, will need more frequent checks than someone who does project-based work that requires long stretches of intense focus. The bottom line: Most people don’t need to check email as often as they do.

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

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"In essence, you need to look at your job and determine how often you need to check in order to be appropriately responsive, yet balance that with the fact you need blocks of time to get things done when you're not working with email," he explains.

OK, that's all well and good, but what about those important misses from a boss or other higher-ups? There's a simple solution, Dean points out: Email programs such as Outlook and Gmail allow you to set up notifications that will alert you when emails arrive from people you deem important enough to warrant work interruptions.

One last technique requires effective use of computerized calendars and task lists. If emails contain something other than quick-action items, put them on a calendar or task list, then hit delete, Dean says.

If you follow these strategies religiously, it's actually possible to attain zero-inbox status. "That doesn't mean I've gotten everything done," Dean notes. "It's just that your inbox is not a good project- or task-management tool. An inbox exists only to process items, not to manage work, projects or people."

Dean concedes that dropping deeply ingrained bad email habits in favor of a more effective management strategy is difficult. "But you have to look at the bigger picture — that constantly checking your inbox literally makes you clinically stupid," he says. "And that isn't good for you or anyone around you at work. It's far better to control email than let it control you."

Unless, perhaps, you simply enjoy pushing the proverbial boulder uphill, over and over again. ♦

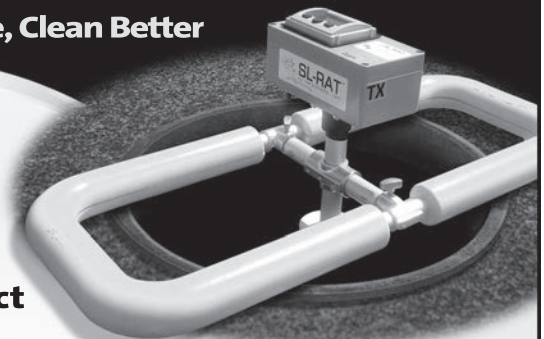
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MAXIMIZE YOUR DATA VALUE

PACP-certified software maximizes the value of inspection data for municipalities

By *Ted DeBoda*

Software programs that are certified by NASSCO for the Pipeline Assessment Certification Program provide a wide variety of features to help utility owners evaluate assets, determine corrective measures and prioritize rehabilitation work.

There are about a dozen certified data collection software packages. Each software vendor has developed unique and valuable tools to facilitate the management and utilization of data collected in the field to include automatic validation of PACP data, the creation of different reports, the ability to manipulate and query data to support rehabilitation recommendations, and product support, to name a few.

When it comes to PACP, the use of NASSCO-certified software is paramount to achieving our mission. When awareness of a product or service such as PACP grows and the user base expands, considerations that didn't arise during development are uncovered and must be addressed.

Education is one of the best ways to ensure PACP-certified software is used to maximize the value of inspection data. System owners may issue a bid for a PACP product, but might also require a specific software. This eliminates one of the best financial benefits of using PACP, which is that any contractor using any PACP-certified software can provide you with a deliverable you can use.

Municipalities that specify a software package are paying contractors to purchase and learn that software rather than bid using the software they're already using. Allowing contractors to use their own PACP-certified software increases competitive bidding. To help guide and educate municipalities during the bidding process, NASSCO's Operations and Maintenance Committee developed a specification guideline that helps municipalities maximize their use of PACP, as well as the Manhole and Lateral Assessment Certification programs.

In general, some municipalities may not understand the structure of PACP

and its databases or realize that once a field is added or a code is changed it is no longer PACP. This is true, in part, because they don't use the software every day. It is our job to provide cities with the education they need in order to receive and appreciate the many benefits of PACP, including the use of PACP-certified software. Additionally, since using PACP-certified software can also mean a significant learning curve for employees not used to importing from the PACP transfer file into CMMS, work order programs or even into other PACP-certified software, our job is also to work with vendors to make that process easier.

One of the O&M Committee's objectives is to develop awareness campaigns and educational programs that communicate ways to:

- Identify NASSCO-certified software via the PACP, LACP and MACP official seals
- Understand that "PACP compliant" does not mean the software is certified
- Ensure software vendors have not violated their Software Vendor License Agreement with NASSCO by excluding standard requirements for certification, including import/export capabilities
- Understand the requirements of NASSCO's license agreement and violation procedures
- Report software vendor violations to NASSCO
- Get the most out of PACP-certified software and data

In the coming months, NASSCO will be working to take PACP to the next level by ensuring municipalities and other users understand the benefits they receive from using PACP-certified software, as well as the many features available to keep our underground infrastructure healthy.

For more information, please visit nassco.org. ♦

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Trainer: Ted DeBoda

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Contact Rizwan Siddiqi, P.E. for more information or to register: 443/739-9234 or email rasiddiqi@gmail.com

December 13

Marriottsville, MD

PACP User Recertification

Trainer: Ted DeBoda

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December 13-15

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November 7-8

Cincinnati, OH

Manhole Rehabilitation

8 a.m. – 5 p.m. Day 1 • 8 a.m. – 12 p.m. Day 2 Morning

Trainer: Tim Back

Contact Tim Back for more information:

513/253-8461 or email timbacktwo@gmail.com

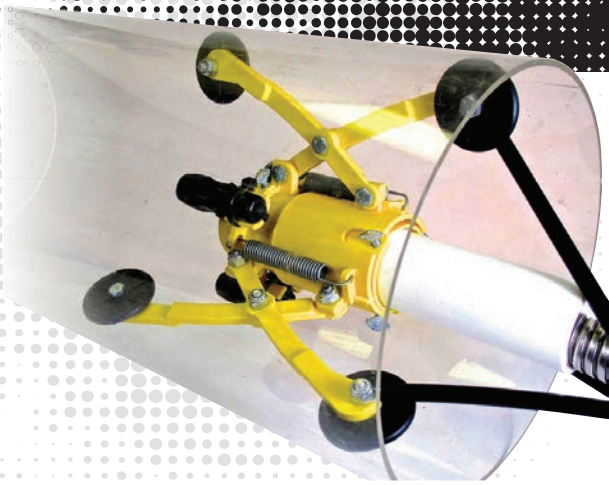
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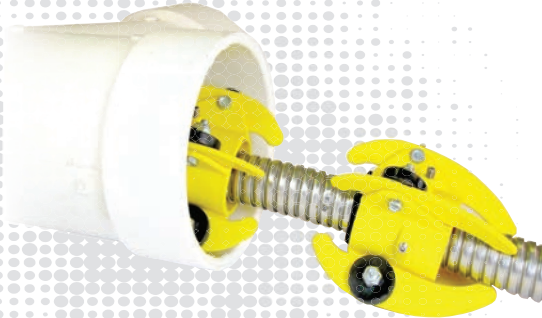
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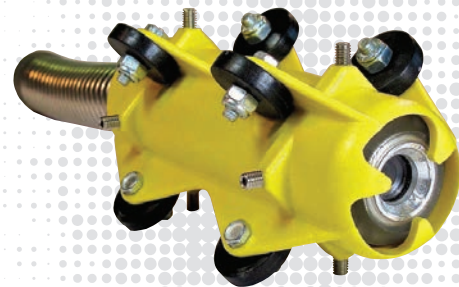


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A GREEN CLEANING OPTION

Vacall's Recycler option allows municipalities to continuously reuse water for jet/vac cleaning

By Craig Mandli

In the drought-ravaged western U.S., municipalities are continuously looking for ways to save not only time, but also valuable clean water. That's why the new Vacall Recycler option for AllJetVac machines, introduced at the 2016 Water & Wastewater Equipment, Treatment & Transport Show, makes sense not only for western cities, but any looking to increase efficiencies.

"The Recycler typically requires no city water during its combination jet/vac sewer cleaning work," says Bill Petrole, vice president of the Vacall product group. For the average municipal jet/vac sewer cleaning truck, that can mean a savings of 5.7 million gallons of water per year, according to Petrole.

"Using the system means crews are able to dramatically increase their productivity," says Petrole. "They start the day without having to fill the water tank and they continue to work all day long, never having to go to a hydrant to fill the tank."

Located at the front of the AllJetVac debris body, where it's protected from damaging road debris, the system works by continuously vacuuming water out of the sewer line, moving it through the Recycler five-step filter process, and then using the same water for the AllJetVac's jetting. In addition to increasing productivity and saving water, the Recycler can also help municipalities save fuel because there's no need for refill trips, and the truck's lighter weight with empty water tanks translates into more miles per gallon. The system offers up to 105 gpm of reclaimed water.

"It's a relatively new concept here, but has been used in Germany for around 20 years," says Petrole. "It is a few more parts than your typical jet/vac system, but the maintenance is minimal, and the efficiencies pay for themselves in short order."



Bill Petrole, vice president of the Vacall product group, discusses the Recycler option for AllJetVac machines with 2016 WWETT Show attendees in the company's booth. The system works by continuously vacuuming water out of the sewer line, moving it through a five-step filter process, and then using the same water for the AllJetVac's jetting. (Photo by Craig Mandli)

The five-stage continual recycling process starts with an initial sediment separation, followed by a floating V-Filtration screening process further separating water from debris. The V-Filtration also has a backflush self-cleaning capability. Centrifugal high-speed action then removes remaining solids, including tiny particles down to 100 microns. Solids and fine particles are then returned to the debris tank via a pressure-regulating valve system. Finally, the recouped water (up to 65 percent from all vacuumed material) is returned to the water tanks to continue jetting. A segregated 240-gallon-capacity clean-water washdown feature is also a part of the system.

"There's really no downtime for maintenance because the system is self-cleaning and doesn't require backflushing or filter changes," says Petrole. "That combined savings in time, money

and water escalates quickly."

The Recycler system was the highlight of Vacall's 2016 WWETT Show space, and Petrole says many customers and potential customers visited especially to learn more about the science behind the system.

"We had a ton of interest from folks looking to see us demonstrate the product," says Petrole. "We got a lot of solid leads out of the show, which gives us a strong base to market this system for the year. We're excited to move forward with it."

As for the 2017 WWETT Show, Petrole says Vacall engineers will continue to examine ways to add efficiencies and potential cost savings to existing technology. "There are always ways we try to expand our product line for the future," he says. "If we can make our products a better fit for a customer, we'll do it." 800/382-8302; www.vacall.com. ♦

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LOCATION AND LEAK DETECTION

By Craig Mandli



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ELECTRONIC LEAK DETECTION

2. Aquarius Spectrum iQuarius

The **iQuarius** smartphone leak detection system from **Aquarius Spectrum** combines an Android app with an acoustic widget, a sensor that creates a powerful system that can perform pipe listening, acoustic survey and acoustic correlation. Pipe listening allows listening and recording very low-frequency sound vibrations. It also provides a graphical presentation of these frequencies. Acoustic survey allows for GIS-based acoustic logging that measures the vibration intensity in water pipes. The noise is recorded and automatically sent to the server for further analysis. Acoustic correlation occurs between two mobile sensors, allowing the user to pinpoint the exact location of a leak. It is ideal for leak detection service teams for both leak surveys and pinpointing. Results can be analyzed on the web application, and the app is available on Google Play. **www.aquarius-spectrum.com.**

3. Arizona Instrument Jerome J605

The **Jerome J605** low-level portable hydrogen sulfide monitor from **Arizona Instrument** is designed to detect at concentrations as low as 3 ppb with a resolution of 20 ppt. It has a survey mode that allows the user to contin-

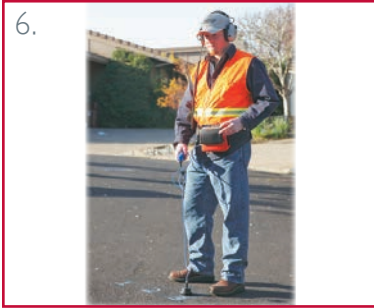
uously draw in samples of air in order to sweep an area for hydrogen sulfide hotspots or leaks and enable corrective action to be taken. Its wide detection range makes it useful for multiple applications, including regulatory compliance and odor control at wastewater and landfill facilities, scrubber efficiency testing and monitoring corrosion in control rooms. **800/528-4711; www.azic.com.**

4. Matchpoint Water Asset Management Enigma3m

The **Enigma3m** from **Matchpoint Water Asset Management** combines leak localization and correlation technology into an efficient and comprehensive leak detection system. Loggers are deployed across the water network, allowing for the continual monitoring of the integrity of the distribution system. This fixed-based acoustic noise logging system requires no above-ground assets and detects leaks remotely using cost-effective GPRS/3G communication, sending data directly from the field to the web-based software, PrimeWeb. PrimeWeb processes the data daily, visually highlighting and prioritizing areas of leakage, and noting all healthy areas of the network. If there is evidence of leakage, the loggers will automatically perform time-synced correlations of each leak with the exact location of the leak(s) identified. It saves time and money, eliminating the process of physically moving loggers across the network, retrieving the data, and manually programming the correlation. **910/509-7225; www.matchpointinc.us.**

5. Mil-Ram Technology TA-2100

The **TA-2100** hydrogen fluoride fixed gas detector with 0.1 ppm resolution from **Mil-Ram Technology** has no false alarms, with sensor technology specifically optimized for continuous-duty service under demanding field conditions. It has self-calibration/auto-gas calibration, with nonintrusive/hands-free/magnetic switches. Offsite sensor calibration is possible with a memory chip embedded in the sensor. It is not affected by temperature. It indicates remaining sensor life and replace sensor indication and number of days since last calibration. It offers continuous diagnostics, with a relay module, graphics LCD and wireless option. **510/656-2001; www.mil-ram.com.**



6. SubSurface Locators LD-18

The **LD-18** digital water leak detector from **SubSurface Locators** reduces ambient, intermittent noises from dogs barking, cars passing by, footsteps and people talking. Its digital electronics sample the sounds every few thousandths of a second, and if it detects an intermittent sound, it suppresses it instantly. Water leak sounds are almost always continuous noises, and the unit can identify continuous leak sounds even in difficult conditions like busy streets. **775/298-2701; www.subsurfaceleak.com.**

7. Syrinix PipeMinder T

PipeMinder T from **Syrinx** incorporates a multi-sensor array for enhanced detection and precision location of leaks on large supply pipelines. It includes a geophone to detect vibro-acoustic signals in the pipeline itself, a hydrophone to detect signals in the water, and a pressure transient monitor. Coupled with a flowmeter, advanced data analysis is able to locate and pinpoint incipient leaks and bursts on high-consequence transmission mains. It is available with a one-year battery power source, making installation and deployment simple. **905/973-6117; www.syrinx.com.**

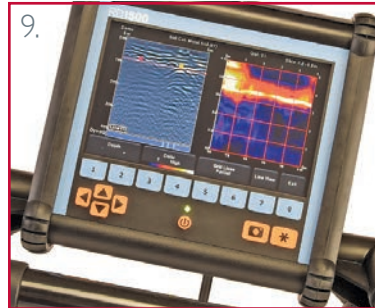
ELECTRONIC LINE LOCATORS

8. IDS North America Opera Duo

The **Opera Duo** from **IDS North America** is an easy-to-use ground-penetrating radar system that uses a dual-frequency antenna to simultaneously detect both deep and shallow buried metallic and nonmetallic pipes and cables and display them on the same screen. It provides easy-to-interpret results in real time, and locates the exact position of pipes, cables and other features of interest. It is compact, easy to transport and deploy, and available in two versions: a small and lightweight two-wheel version and a four-wheel version more stable and adaptable for use on rough terrain. **303/232-3047; www.idscorporation.com/na.**

9. Radiodetection Corporation RDI500

The **RD1500** ground-penetrating radar utility locating system from **Radiodetection Corporation** includes an internal GPS, onboard Wi-Fi and a high-resolution touch screen. It allows users to create depth slices and review their locate path on screen while on site, and selectively enhance shallow/small, medium depth/size, or deep/large targets using



FrequenSee. By recording grid scans, users can view not only line views but also perform depth slices, increasing the clarity of the collected data. **FrequenSee** exploits the wide-bandwidth antenna and allows the user to select the low, medium or high part of the frequency spectrum to focus on the desired features, selectively enhancing small, medium, large or all targets for easier viewing and detection. It includes an external GPS and the Enhancement package, which enables PC users to slice through the exported depth data and export data to other formats. **877/247-3797; www.radiodetection.com.**

10. Subsite Electronics 830R/T

Made to withstand the demands of rugged job sites, the **Subsite Electronics 830R/T** high-frequency electronic locator offers performance at a very high active frequency. This contractor-grade locating system can trace poor conductors, such as ungrounded tracer wire, and locate short lengths of utility infrastructure. Automatic features such as gain control, auto depth, and visual and audio feedback make it easy for operators to confidently identify and trace metallic pipe or cable, water and gas distribution lines. The system offers 150 hours of battery life on the transmitter, and 75 hours on the receiver. Adaptive filtering ensures that it is highly responsive in all modes of operation, quickly providing left-to-right guidance regardless of mode or operator style. In **Peak Verify** mode, the system gives operators an additional way to confidently verify the locate. **800/846-2713; www.subsite.com.**

11. SubSurface Instruments AML Series All Material Locator

AML Series All Material Locators from **SubSurface Instruments** use modulated, powerful 2.45 GHz ground-penetrating, UHF radio waves to locate subsurface objects with ease. Using technology that was developed

(continued)



for lunar exploration, it locates materials indiscriminately, including PVC, PE, metal, wood, cable or pipe. It will work in clay, wet soil, snow and standing water. Man-made objects with a straight edge create a change in density or permeability from surrounding materials, which causes refracted radio waves to be detected by the AML. The highly sensitive dual left and right receivers activate a laser indicator that highlights the buried object's position on the ground. It includes GPS plotting and tracking and has 32 sensitivity settings. **855/422-6346; www.ssilocators.com.**

12. Vivax-Metrotech Spar 300

The **Spar 300** utility surveying system from **Vivax-Metrotech** collects positions in site coordinates, in a package that easily adapts directly to a range pole, ATV, riverboat or pushcart. It continuously logs the utility depth and offset, along with statistical confidence and automatic offset calculations. Over a Bluetooth or USB link, the instrument outputs the 3-D positions to a Trimble TSC3 or tablet for real-time display on the Trimble Access map, independent of its own perspective with respect to the utility or the GNSS antenna. When a complex locate scenario is encountered, as can occur when several utilities are co-located within a common right-of-way, it applies automatic tolerance masks to the position data, flagging these areas on the map. **800/446-3392; www.vivax-metrotech.com.**

PUSH TV/CRAWLER CAMERA SYSTEMS

13. Amazing Machinery Viztrac Max

The **Viztrac Max** camera from **Amazing Machinery** has the same durability and super-slick push cable as previous Viztrac cameras, with a 22 percent larger 9-inch LCD color display and a rechargeable lithium-ion battery pack capable of up to eight hours of field use before recharge. The unit includes an AC/DC adapter for direct power supply, a 512 Hz sonde transmitter and a DVR that records to a standard SD card. A 4GB card is included. **800/504-7435; www.amazingmachinery.com.**

14. Electric Eel Ecam PRO 2

The **Ecam PRO 2** from **Electric Eel** allows technicians to quickly inspect 3- to 10-inch pipelines and locate a wide variety of pipeline problems. It includes a stainless-steel-housed 1.68-inch-diameter self-leveling color camera with sapphire lens, 20-LED light ring and high-resolution CCD element. A flexible camera spring navigates 3-inch P-traps. The auto-iris adjusts light-

ing automatically. It provides a 512 Hz sonde and has a 10.4-inch daylight-readable display with an on-screen footage counter. It offers 16 pages of text writing with memory saves and click-touch controls with one-touch recording directly to a USB flash. It has voiceover recording and audio/video out jacks, 8x zoom function and adjustable light controls, and a two-hour battery with built-in charger. It comes standard with 200 feet of Kevlar-braided 1/2-inch-diameter pushrod. It has a powder-coated steel tube and bar construction with a secure-locking reel brake. It rolls on 8-inch wheels for easy maneuverability. **800/833-1212; www.electriceel.com.**

15. Insight Vision Cameras IRIS Pan & Tilt

The **IRIS Pan & Tilt** mainline crawler from **Insight Vision Cameras** incorporates a motorized crawler and a power rewind/feed assist cable drum. The level rewind reel allows the video cable to be rewound at the same speed the crawler is moving to avoid running over the cable. It allows full 360-degree rotation and 180-degree pan for lateral sewer pipe inspection. It is engineered for inspection of pipe from 6 to 12 inches in diameter, and up to 18 inches with an optional pneumatic wheel set. The motorized drum holds 600 feet of flexible and rugged video cable. It is built with a telescopic handle and self-contained wheels for easy movement and portability. The system operates on Window 7 64-bit software with 500GB of solid-state drive. It incorporates an integrated accessory power outlet, multiple recording ports, HDMI external port, 10-inch LCD touch screen, Windows apps, snapshots, on-screen footage and text writer. **800/488-8177; www.insightvisioncameras.com.**

16. MyTana Manufacturing MS11-NG

The **MS11-NG** midsized video inspection system from **MyTana Manufacturing** can be used to inspect 3- to 4-inch lines, and is available with 200 feet of strong pushrod. It has a 1 1/2-inch color self-leveling camera head, a

(continued)

For more information visit
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built-in 512 Hz transmitter allowing a technician to locate during the inspection, and a daylight-readable 6.4-inch monitor. A technician can record or upload an inspection using the MyTana Viewer App, available for iPhone, iPad and Android. Built-in Wi-Fi allows multiple viewers on relining/rehabilitation projects. Inspection records can be uploaded to YouTube or still photos emailed to customers. Media connects through RCA jacks on the front of the unit. **800/328-8170; www.mytana.com.**

17. Pearpoint P340+ flexiprobe

The **P340+ flexiprobe** pushrod sewer camera system from **Pearpoint** is lightweight, rainproof, rugged and has a built-in lithium-ion battery. Reliable and interchangeable cameras produce sharp digital pictures, which can be recorded externally or onto USB or compact flash memory. Advanced digital capabilities mean that users can zoom, pan and rotate images during recording to focus in on problem areas. Compact reel designs allow the systems to be fully transportable and protected in transit. A wide range of compatible sondes, skids, brushes and accessories completes the package, allowing inspection of pipes up to 9 inches in diameter. **800/688-8094; www.pearpoint.com.**

18. RapidView IBAK North America MiniLite

The **MiniLite** pipe inspection system from **RapidView IBAK North America** allows users to inspect, record and measure the internal dimensions of smaller pipelines. During normal inspection operations users can accurately capture diameter measurements with one touch using the ORION Zoom Camera. The system consists of a cable coiler cartridge that makes replacement a snap, a portable command console and one of several choices of cameras. It includes a high-visibility 10.4-inch monitor and a full QWERTY keyboard. Inspections can be recorded on a built-in MPEG digital video recorder on SD and SDHC memory cards. The system is currently available in 100- and 130-foot lengths. **800/656-4225; www.rapidview.com.**

19. Ratech Electronics Elite SD Wi-Fi

The **Elite SD Wi-Fi** from **Ratech Electronics** allows technicians to record pipe inspections wirelessly to an iOS or Android device, and take live video and digital still photos that can be immediately uploaded to YouTube, so there's no more recording to USB thumb drives, SD cards or DVDs. Simply

download the app to an iPhone or iPad and stream the video wirelessly. The Wi-Fi interface is available on any current Ratech product or existing Ratech systems in the field, and is available with a sun-readable 10-inch LCD monitor and either a self-leveling camera, small ultra-micro camera or pan-and-tilt push camera. Systems come in cable lengths from 100 to 400 feet. **800/461-9200; www.ratech-electronics.com.**

20. RIDGID SeeSnake rM200

The **SeeSnake rM200** camera system paired with the CS65 digital reporting monitor from **RIDGID** provides a solution for a wide range of pipeline inspection projects. The rM200 is capable of inspecting lines up to 200 feet in length and 1 1/2 to 6 inches in diameter. It comes with a choice of two drums that each have different push-cable lengths, diameters, stiffness and springs for on-the-job flexibility. The CS65 digital reporting monitor can be docked to the rM200, allowing for an integrated transport system for easy portability. It has one-touch image recording for fast, efficient documentation of inspections. It has a 1TB internal hard drive that provides ample storage for multiple jobs. PhotoTalk pairs audio commentary with an image in an email-ready file. A built-in, water-resistant keyboard allows for the easy addition of on-screen titles and annotation of captured media. **800/769-7743; www.ridgid.com.**

21. Spartan Tool Sparvision 200

At 25 pounds, the **Sparvision 200** pipe inspection camera from **Spartan Tool** is self contained for easy on-the-job maneuverability. It comes with the choice of either an iPad Air or Samsung Galaxy S10 as the viewing screen, and is also compatible with personal devices. It comes with 200 feet of ultra-slick pushrod and a color self-leveling camera. It offers instant snapshots, an on-screen keyboard and telestration drawing ability, a 512 Hz locating beacon and distance counter. **800/435-3866; www.spartantool.com.**

(continued)

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With faster launch speeds, shorter more flexible front connector options, and smaller launch cameras, the LISY 3.2 is perfect for your more demanding projects, **including reverse-launches**.





SMOKE LOCATORS

22. Hurco Technologies Power Smoker 2

The **Power Smoker 2** from **Hurco Technologies** quickly locates leaks in new and existing plumbing systems. The machine is connected to a clean-out, and smoke is sent through the system to reveal any problem areas. The system uses LiquiSmoke, a laboratory-tested safe smoke that costs cents per minute to use and has an indefinite shelf life. When the test is complete, the smoke dissipates without leaving an odor or residue. **800/888-1436; www.hurcotech.com.**

23. Superior Signal smoke generator

Smoke generators from **Superior Signal** offer a cost-effective method to find sources of surface inflow causing wet-weather sanitary sewer overflows. It is a fast and easy way to find leaks and faults in collections systems, laterals, plumbing, drains and vents. Classic Smoke Candles and Smoke Fluid Systems, plus Smoke Blowers are available specifically for smoke testing. Classic Smoke Candles provide visible smoke to detect faults at a long distance. Smoke generators are available in sizes to fit any need, from 30 to 500,000 cubic feet. Smoke Fluid Systems use an insulated heating chamber with stainless steel injector to maximize dry smoke output and produce quality liquid-based smoke. The smoke meets WEF, NASSCO and EPA standards. **800/945-8378; www.superiorsignal.com.**

24. TURBO FOG M-45

The **TURBO FOG M-45** is a versatile, lightweight, portable, self-contained smoke generator capable of producing dense, voluminous white smoke using leak-proof liquid smoke cartridges. Each cartridge can be replaced in seconds, allowing quick and easy replacement even while the unit is operating, allowing for uninterrupted smoke production. There is no need to add additional smoke bombs or pump garden sprayers for additional test time. The Briggs & Stratton-powered turbine-type blower is a lightweight 45 pounds and creates a discharge velocity of over 75 mph and 2,000 cfm. It continues to work under pressure in up to 5.75 inches of water. It is available with a plumbing conversion kit. **800/394-0678; www.turbo-fog.com.**

TRANSMITTERS

25. Fluid Conservation Systems PermaNet+

The **PermaNet+** wireless network from **Fluid Conservation Systems** helps reduce water lost from leaks while saving time, money and labor. Responses are immediate when leaks are detected, eliminating the need for site visits and drive-by patrols. The system is installed in the chamber, removing the need for disruptive above-ground installations. It works with FCS Permalog wireless leak noise loggers. Customers will receive leak reports generated by Permalogs on any internet-enabled device, and the status of each deployed logger is shown on map-based software. The system can send a leak alert whenever a logger detects a potential leak, enabling rapid response and minimizing water loss. **800/531-5465; www.fluidconservation.com. ♦**

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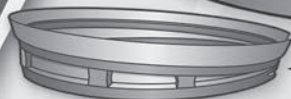
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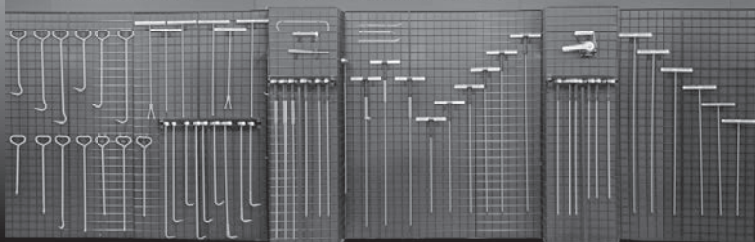
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Scanning system finds large leaks in recent CIPP project



Problem:

A Tennessee-based sewer agency had Electro Scan conduct a pre-CIPP assessment of a 390-foot vitrified clay pipe, revealing 67 defects having a combined leakage rate of 16.5 gpm. Three months later, a contractor installed a CIPP liner. Electro Scan performed a second assessment, this time finding two leaks in the same location, but both larger than before, with a combined leakage rate of 15.2 gpm, or only an 8 percent flow reduction from the previous assessment.

Solution:

The two defects were tracked to lateral connections where the host pipe had been damaged from the remote tap cutting process. Based on **Electro Scan** findings, the agency issued a change order to install lateral connection liners as the repair.

RESULT:

A third Electro Scan inspection was conducted, resulting in a 99 percent flow reduction from the initial inspection. The pipe had a remaining leakage rate of just 0.2 gpm. The agency and contractor were confident the sewer was leak-free, having a complete audit trail of its rehabilitation. **800/975-6149; www.electroscan.com.**

Leak detection system saves money for Texas school

Problem:

A leak beneath Anna Middle School in Anna, Texas, caused water to surface in the parking lot. The problem presented potentially costly demolition and repair costs.

Solution:

The school called Spencer Plumbing Co., and a technician used a **Gen-Ear LE** water leak detection system from **General Pipe Cleaners**. Compact and lightweight, the unit uses the most advanced acoustical leak detection system available to quickly and accurately locate leaks in cast iron, copper,



steel and PVC lines. “The school thought we’d bust up the building slab and parking lot just to locate the problem,” Spencer Plumbing owner Bryan Spencer recalls. “But our Gen-Ear showed them exactly what — and where — the troubles were.” Built-in preset audio filters removed ambient noise interfering with accurate leak detection. So instead of traffic or wind, operators heard the whoosh or hiss of water leaks. The ground sensor detects gurgling or hammering of cracked pipe as far as 8 feet belowground, through hard surfaces like concrete or tile. Probe rods locate leaks beneath soft surfaces like grass or carpet, or for above-ground valves or hydrants.

RESULT:

General’s easy-to-use equipment quickly found two distinct problems. “We fixed the small inside leak without major disruption,” Spencer says. He then showed how the serious outside leak actually channeled water down a ditch to where it was surfacing in the parking lot. **800/245-6200; www.drainbrain.com.**

Sewer jet cam saves city money



Problem:

The Ridgeland, Mississippi, Sewer Department experienced a leak on a customer lateral, but due to an easement issue it couldn’t inspect the line with standard CCTV. The city wanted to avoid having to remove fence and dig up the customer’s backyard.

Solution:

Inspection was completed with a portable **Pipeline Renewal Technologies CleanSteer** jet camera, distributed by **Green Equipment**. The portability of the camera allowed the system to be set up at the manhole in the

easement behind the customer's home. Technicians ran the hose from the trailer jetter on the street in front of the home. Steering and propulsion jets allow this unit to inspect the lateral line after being deployed from the manhole into the main. Location is determined due to the ability to locate the conductor inside the hose. This is completed using a utility locator to trace the hose from the reel to the camera head.

RESULT:

The system allowed the city to determine the problem was on the customer's side of the service and not the city's responsibility. This 30-minute inspection provided video verification and the location of the sewer leak causing the problem, saving the city thousands of dollars by not having to take down a customer's fence and dig up their backyard. **800/391-7612; www.greenequipco.com.**

Software enables easier operations and asset management



Problem:

The high level of drinking water losses in Peru is first and foremost due to leaking pipes and the existence of illegal service connections. The supply of water is subject to severe restrictions in many parts of the country, and the use of contaminated water from rivers and canals makes people ill. The technical equipment and skills required to locate and repair leaks or track down illegal service connections are mostly out of date or lacking altogether.

Solution:

By setting up training centers in five of Peru's cities, the plan is for selected water supply companies to significantly reduce drinking water losses and bring about lasting improvement with the help of modern technology. Sewerin offered instruction on how to use ground microphones like the AQUAPHON and SeCorr correlator for computer-assisted detection of leaks.

RESULT:

The companies taking part in the training have been able to reduce the level of water losses by 10 percent in a short period of time. The declared goal is to force down the rate of losses to below 20 percent to ensure that Peru can preserve water on a long-term basis. **888/592-9916; www.sewerin.com.** ♦

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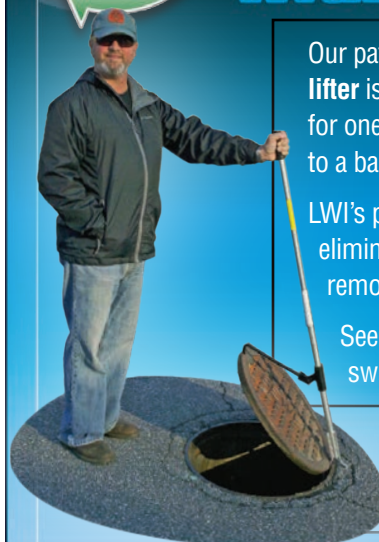
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Product Spotlight

Compact, truck-mounted excavator can dig with air or water

By Luke LeNoble



The HXX ParaDIGm truck-mounted vacuum excavator from Vactor Manufacturing is designed to dig holes with air or water for the installation, maintenance and repair of underground infrastructure and utilities.

“It’s designed to do quick pothole locates,” says Ben Schmitt, product manager. “The focus was on being able to pull up to the job site, start the application, finish the application as fast as possible, so you can do several potholes successfully without having to put a lot of time in-between each hole.”

The Park-n-Dig feature minimizes the time between arriving on the job site and excavation. The excavator features an extendable boom with a 6-inch vacuum hose. The vacuum system produces up to 2,200 cfm and is capable of digging up to 6 feet without additional pipe and hose.

“When you’re digging around unknown utilities, the only way to do it effectively and safely is with vacuum excavation,” Schmitt says. “It’s quick, easy, and the ParaDIGm with its 6-inch vacuum hose is much faster and clogs less compared to 3- and 4-inch systems on trailer units.”

Available on a Class 6 (non-CDL, state dependent) or Class 7 chassis, the excavator offers a maximum payload of 6,000 pounds.

“Weight capacity is a major, major issue in a lot of states,” Schmitt says. “Weight tickets are becoming more frequent, more expensive, so we’re try-

ing to build something for the customer that allows them to maximize their payload capacity but still do it on a chassis that doesn’t require a CDL.

“It’s just a smaller size and scale compared to larger truck-mounted units, but for its size, it’s pretty powerful,” he says.

Since no special license is needed, the ParaDIGm also makes it easier to find operators and drivers.

“It’s getting harder and harder to find people who can drive a CDL truck and who can also drive manual transmissions,” Schmitt says. “So we’ve set out to have something that anybody can drive.”

A single-engine, PTO-design drives all vacuum, air and water systems. An onboard air compressor is able to power utility tools such as jackhammers and tampers. Additional storage space accommodates replacement parts, equipment and tools.

With the ability to use air or hydroexcavation as a digging method, the ParaDIGm can be used in a variety of applications.

“It comes standard with air excavation capabilities and hydroexcavation capabilities,” Schmitt says. “The reason for that is some areas don’t allow you to use water, and air allows you to use the material to put back in the hole when you’re done, for example.” **800/627-3171; www.vactor.com.**

Cortec EcoShield 386 water-based spray coating

EcoShield 386 water-based spray coating from Cortec is designed to protect metal structures in harsh conditions where UV defense and salt resistance are required. The coating can be applied by spray, brush or dipping and is also available in a winterized version. **651/429-1100; www.cortecvci.com.**



McLaughlin Vermeer Eco Truck Series

The Vermeer Eco Truck Series by McLaughlin is a compact vacuum excavation system



with a focus on improved fuel efficiency. Trucks feature 49, 85 or 99 hp auxiliary engines, 500-gallon spoil tanks and the ability to be mounted on new or used truck chassis. **800/435-9340; www.mclaughlinunderground.com.**

Water Cannon electric pressure washer package

The electric-powered Jetter Package from Water Cannon delivers 2 gpm and 1,500 psi. The low profile and compact hand-carry version includes a 150-foot by 1/4-inch Piranha jetter hose, a 50-foot by 1/8-inch trap hose, ball valve, pulsation valve on demand, and four stainless steel jetter nozzles. The pressure regulator can be adjusted from 150 to 1,500 psi. **800/333-9274; www.watercannon.com/catalogrequest.aspx.**



(continued)

Ranger Design seat covers

Stain-, tear- and wear-resistant seat covers from Ranger Design are designed to fit popular commercial vans. Made from heavy-duty Cordura fabric for puncture and tear resistance, the seat covers are urethane coated for additional protection against fluid spillage and stains. The seat covers are machine washable and can be installed in less than 30 minutes. 800/565-5321; www.rangerdesign.com.



Strattec Security ignition-key programmable padlocks

BOLT locks from Strattec Security feature one-key lock technology that enables the lock to be opened by a single ignition key. The BOLT product line includes padlocks, receiver, coupler pin, cable and toolbox locks that are permanently programmed the first time the ignition key is inserted into the lock cylinder. Designed for heavy-duty work trucks, including Pro Star, International 4000 Series, International Terra Star, Mitsubishi Rader, Sterling Condor, Volvo VN Series, as well as Freightliner Century and Columbia models, the locks can be used to secure tools, gear, trailers and other valuable equipment. Features include an electroless nickel-plated steel pin or shaft/shield, stainless steel lock shutter, protective rubber shell and six-plate tumbler sidebar that prevents picking and bumping. 844/972-7547; www.boltlock.com.



Vermeer horizontal directional drill

The D10x15 S3 Navigator horizontal directional drill from Vermeer is designed for utility installations. The drill is 12 1/2 feet long and is equipped with a 60 hp Deutz TD2.9 Tier 4 Final engine. It is capable of thrust/pullback to 10,000 pounds with a maximum torque to 1,500 ft-lbs, maximum spindle speed to 220 rpm and maximum carriage speed to 208 feet per minute. The drill's sound levels help reduce noise and disturbance on residential job sites and enables easier communication between crew members. 641/628-3141; www.vermeer.com.



RIDGID StrapLock pipe handle

The RIDGID StrapLock pipe handle is designed to simplify the installation, maintenance and handling of large-diameter plastic pipe. The handle grips plastic pipe from 3 to 8 inches in diameter with its rapid size adjustment. Ideal for use in tight quarters and wet conditions, the handle allows force to be applied in all directions. 800/769-7743; www.ridgid.com.

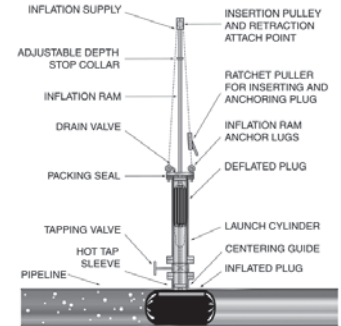


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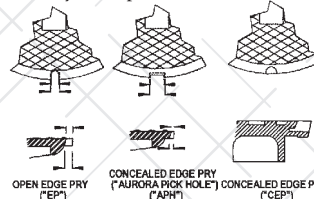
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Johnson Service Company, a division of Midlands Contracting based in Kearney, NE, is now hiring for the position of Foreman-Sewer Cleaning & Inspection. Previous experience and a Class B CDL is required. This position requires the direct supervision of a 2-3 person crew. Strong mechanical aptitude and the ability to complete quality work in a timely fashion is a must. Position includes operating state-of-the-art cleaning & inspection equipment with a primary focus on the municipal market. \$20/hr. and up based on experience. Paid vacation time and holidays. Relocation package available. Go to www.midlandscontracting.com for more information on this position and to apply. Go to www.johnsonservicecompany.com for more information on Johnson Service Company. (M11)

Water Utility Company seeks CSI/BPAT. Qualified candidates will possess a Customer Service Inspector license (CSI) and/or a (BPAT) Backflow Prevention Assembly Tester, or able to get certification within 6 months. Job duties to include CSI, BPAT, sewer inspection, Pre-builder and post-construction inspections, grease trap, oil separator, cooling towers and storm outfalls. Working knowledge with blue prints, both civil and MEPS. Be able to represent company in a professional manner. Able to be self-motivator and work independently. Possess good driving record, punctual and organized. Must be insurable, reliable and courteous. We need to blanket every known trade magazine, organization, newspaper, etc. Please send resume to employmentopportunities@edpwater.com (M11)

GapVax, Inc., a nationally recognized manufacturing business, is seeking a talented, highly motivated individual to fill a full-time Sales Position in the Midwest (Iowa based preferred) region. GapVax is the leading manufacturer of industrial and municipal vacuum units and hydroexcavation units in the United States. We provide the most reliable, comprehensive, and efficient mobile vacuum units in the industrial and municipal markets. Specifications of the position are listed on our website, www.gapvax.com, click on the Now Hiring link in the left hand column. Send resumes to or betty@gapvax.com or 575 Central Avenue, Johnstown, PA 15902. (MBM)

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TRIC Tools hosts South American engineers

TRIC Tools hosted four engineers from the Sedapal Water & Sewer Authority, the Peruvian state-owned water utility in Lima. TRIC introduced the group in June to its manufacturing process and new municipal pipe bursting developments. Sedapal is executing a \$3.25 billion dollar plan to bring 100 percent water and sanitation coverage to Lima and neighborhood areas.

JWC Environmental names senior vice president

JWC Environmental promoted Greg Guard to senior vice president of global sales. He will direct global sales initiatives and strategies.



Greg Guard

Jetstream of Houston celebrates 40th anniversary

Jetstream of Houston celebrates 40 years in the industry this year. Since its founding in 1976, the company has focused on providing customers worldwide with a range of high-pressure waterblasting equipment, trailer-mounted pumps and accessories.

RapidView appoints sales manager and training expert

RapidView IBAK North America named Richie Notz Southern U.S. and U.S. Caribbean Islands sales manager. Notz has past experience in customer training and operation of IBAK equipment. Chad Pugh was appointed training and installation expert. Pugh has 24 years of experience in the manufacturing industry.

SAK Construction hires VP of human resources

SAK Construction named Melva Pete vice president of human resources. She has years of experience in human resources and a diverse corporate background.



Melva Pete

Hydra-Flex finalist in Minnesota Manufacturing Awards

Hydra-Flex was a best-in-class finalist for the Minnesota Manufacturing Awards. Hydra-Flex is part of the Small Company Class for businesses with less than 50 employees.

Federal Signal expands service center

Federal Signal Environmental Solutions Group completed the expansion of its FS Solutions service center in Leeds, Alabama. The facility houses all operations related to parts, Jetstream support, blower rebuild and shipping. The expansion includes a truck loading dock and improves efficiency of inventory handling, shipping and parts pulling by 25 percent.



Ferguson chief financial officer named CFO of the Year

Virginia Business magazine named Dave Keltner, chief financial officer of Ferguson Enterprises, CFO of the Year. Keltner was honored in the Publicly Traded Companies category and is a 23-year veteran of Ferguson.

The Work Truck Show sets future dates

The Work Truck Show and Green Truck Summit returns to Indianapolis in 2017 and 2018. The 2017 show will be held March 14-17 at the Indiana Convention Center. Dates for the 2018 show are March 6-9. The Work Truck Show features the latest vocational trucks, vans, vehicle components and equipment on a trade show floor covering over 500,000 square feet. The event includes an educational conference with over 60 sessions designed to help attendees improve operations.

Isuzu opens Center of Excellence training facility

Isuzu Commercial Truck of America opened its first Center of Excellence in northeast Pennsylvania. The complex includes 100,000-square-foot parts distribution center and 30,000-square-foot training and technical assistance facility.

COLE Publishing editor Ed Wodalski passes away

Ed Wodalski, longtime contributor and editor with COLE Publishing, passed away suddenly on Sept. 21. He was 64. In addition to his writing contributions, Ed held many roles at COLE, including primary proofreading and coordinating national photo shoots and assignments. Most recently, he was the print and digital editor for *Plumber* magazine, and also oversaw the product and industry news for nine COLE publications. "Ed was not only a loyal contributor to the COLE team, but a mentor, family man and friend. He will be deeply missed," said Jeff Bruss, president of COLE Publishing. Ed is survived by his wife, Dawn; son, Michael; daughter, Nicole; and three grandchildren.



Ed Wodalski

Avanti International celebrates World Trenchless Day

In recognition of World Trenchless Day, Sept. 22, Avanti International presented the webinar "Re-Living 50 Years of Municipal Grouting and WHAT'S NEXT." Presenters included Harold Kosova, National Power Rodding; C. Vipulanandan, CIGMAT; Ted DeBoda, NASSCO; James Shelton, ARCADIS; Daniel Magin, Avanti International; Marc Ancil, Logiball; Ron Manestar, Aries International; Pete Fleetwood, Bio-Nomic Services; Mark Schneider, CUES; and John Manijak, Michels Pipe Services.


Aclara acquires Smart Grid

Aclara acquired the Smart Grid business of Tollgrade Communications. Included in the acquisition were the LightHouse Sensors and Sensor Management System software with Predictive Grid Analytics and other intellectual property. ♦

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PEOPLE/AWARDS

The **Environmental Protection Agency** awarded Great Lakes Shoreline Cities Grants to the following locations to fund green infrastructure projects that will improve Great Lakes water quality.

- **East Chicago, Indiana (\$175,000)** will install green infrastructure at Jeorse Park to reduce stormwater runoff and filter sediment, nutrients, chemicals, bacteria and other contaminants before they reach the beach and Lake Michigan. These new installations will prevent 290,000 gallons of unfiltered runoff from reaching Lake Michigan.
- **Ashtabula, Ohio (\$175,000)** will install green infrastructure at Walnut Beach to re-establish a functional, connected dune system to prevent untreated stormwater from flowing across the beach and directly into Lake Erie.
- **Cleveland, Ohio (\$175,000)** will install bioretention cells at Wildwood Park to capture and treat stormwater runoff, preventing 660,000 gallons of untreated stormwater runoff from reaching Lake Erie.
- **Huron, Ohio (\$125,439)** will install green infrastructure at Lake Front Park that will filter sediment, nutrients, chemicals, bacteria and other contaminants, and prevent 600,000 gallons of untreated stormwater runoff from reaching Lake Erie.
- **Sandusky, Ohio (\$175,000)** will design and construct rain gardens and install a meadow at Lions Park to convey, capture and treat stormwater. The project will reduce 280,000 gallons of untreated runoff from reaching Lake Erie.
- **Vermilion, Ohio (\$175,000)** will install green infrastructure at Main Street Beach to reduce stormwater runoff and pollutant discharges to Lake Erie. Proposed projects include the installation of permeable pavement, bioretention areas and a tree pit that will prevent 450,000 gallons of untreated stormwater from discharging into the lake.
- **Duluth, Minnesota (\$58,000)** will construct rain gardens, plant trees and restore shoreline buffer at Park Point to prevent 89,000 gallons of untreated stormwater runoff from reaching Lake Superior.
- **Evans, New York (\$172,125)** will install rain gardens and open swales in Evans Town Park to reduce bacteria at the beach and prevent 221,000 gallons of untreated stormwater from reaching Lake Erie.
- **Algoma, Wisconsin (\$175,000)** will install infiltration basins, rain gardens and permeable pavement at Crescent Beach that will prevent 110,000 gallons of untreated runoff from reaching Lake Michigan.
- **Ashland, Wisconsin (\$175,000)** will construct infiltration swales, plant native vegetation and replenish beaches over 2.9 acres of land at Maslowski Beach to prevent 219,000 gallons of untreated runoff from reaching Lake Superior.

- **Manitowoc, Wisconsin (\$167,603)** will install green infrastructure at Blue Rail Marina Beach to replenish the beach and improve nearshore water quality, preventing 8,000 gallons of untreated runoff from reaching Lake Michigan.
- **Two Rivers, Wisconsin (\$175,000)** will construct wetlands at Neshotah Beach North that will improve water quality through natural filtering and reduce nutrient discharges, preventing 10 million gallons of stormwater from reaching Lake Michigan.
- **Wind Point, Wisconsin (\$122,691)** will install bioinfiltration, plant native vegetation and replenish beaches at Wind Point Lighthouse Beach to reduce fecal pollution and prevent 195,000 gallons of untreated stormwater from reaching Lake Michigan.

The **city of Lebanon, Pennsylvania**, was awarded a nearly \$94,000 state grant to help better manage its stormwater runoff. The funding was announced by the Department of Environmental Protection to improve urban stormwater runoff through its Local Stormwater Best Management Practice Implementation Program.

Jay Crawford was named the Public Works director for the city of Simpsonville, South Carolina.

LEARNING OPPORTUNITIES

American Water Works Association

AWWA is offering a webinar titled “What You Need to Know About Climate Risks to Water Utility Infrastructure and Assets” on Nov. 30. Visit www.awwa.org.

Delaware

The University of Wisconsin Department of Engineering-Professional Development is offering “Municipal Engineering Fundamentals for Non-Engineers” on Dec. 6-7 in Newark, Delaware. Visit epdweb.engr.wisc.edu. ♦

CALENDAR

Nov. 2-3

WJTA-IMCA Conference & Expo, Ernest N. Morial Convention Center, New Orleans. Visit www.wjta.org.

Nov. 13-17

American Water Resources Association 2016 Annual Conference, Florida Hotel and Conference Center, Orlando, Florida. Visit www.awra.org.

April 23-26

American Public Works Association 2017 North American Snow Conference, Iowa Events Center, Des Moines, Iowa. Visit www.apwa.net.

April 30-May 2

American Water Resources Association 2017 Spring Specialty Conference, Snowbird Ski and Summer Resort, Snowbird, Utah. Visit www.awra.org.

June 25-28

American Water Resources Association 2017 Summer Conference: Climate Change Solutions, Sheraton Tysons Hotel, Tysons, Virginia. Visit www.awra.org.

July 16-19

American Society of Agricultural and Biological Engineers 2017 Annual International Meeting, Spokane, Washington. Visit www.asabe.org.

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.

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