

MUNICIPAL

SEWER
&

WATER™

FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE

March 2020

www.mswmag.com

TECH TALK: FLOWMETERS HELP
GRAND RAPIDS SAVE \$1 BILLION

PAGE 30

BETTER MOUSETRAPS: AERATOR SYSTEM
SOLVES LIFT STATION ISSUES

PAGE 24

HUMAN SIDE: MANAGERS SHOULD
RETHINK TRADITIONAL ROLES

PAGE 16

INSURING A BRIGHT FUTURE

Utah district takes control
of lateral lines for the benefit of its
collections system and customers

PAGE 18

TV/VIDEO INSPECTION &
LOCATION DIRECTORY

PAGE 26

Jerry Knight
General Manager
Sandy Suburban
Improvement District
Sandy, Utah

PRODUCT FOCUS:
MAINLINE TV INSPECTION AND LOCATION





J E T - P O W E R E D INSIGHT

Thread Jetscan on your jetter hose to capture HD video of pipe condition. Stream footage to a tablet for review, then upload it to WinCan Web for secure sharing online.

Wireless charging, quick-change sleds and self-leveling view—see what else sets Jetscan apart. Schedule your FREE on-site demo at www.envirosight.com/jsdemo



*Onscreen text-writing
and image markup.*



Envirosight

(866) 936-8476 • www.envirosight.com

inspection crawlers | zoom survey cameras | video nozzles | push cameras | manhole scanners | inspection trucks | data management

75 YEARS of INNOVATION IN ACTION



APRIL 5-9 | DENVER, COLORADO

NO-DIG SHOW

2020

BOOTH #207



RapidView®

IBAK North America

Sourcewell
Formerly NJPA

Awarded Contract

Push | High Def | Mainline | Lateral Launch | 3D Mapping | PANO 4K Scanner | Rehabilitation | Software
(800)-656-4225 | www.rapidview.com | Past Proven. Future Ready.

IBAK Inspection Equipment Manufacturing is Certified ISO 9001:2015 and ISO14001: 2015.

CONTENTS

NO-DIG SHOW ISSUE, CONEXPO SHOW ISSUE,
MAINLINE TV INSPECTION AND LOCATION



ON THE COVER: General Manager Jerry Knight oversaw the Sandy (Utah) Suburban Improvement District's implementation of a lateral line insurance program that could serve as a model for other communities. (Photography by Kim Raff)



FEATURES

12 **WATER: Taking Care of Every Drop**

Rapid growth and new technology fuel Tennessee utility's quest for greater efficiency.

By Jim Force

18 **SEWER: Insuring a Bright Future**

Utah district takes control of lateral lines for the benefit of its collections system and customers.

By Giles Lambertson

26 **TV/VIDEO INSPECTION AND LOCATION DIRECTORY**

COLUMNS

8 **FROM THE EDITOR: Be Smarter Than the Squirrel**

Don't get so caught up chasing a nut that you forget the big picture.

By Luke Laggis

10 **@mswmag.com**

Visit daily for news, features and blogs. Get the most from *Municipal Sewer & Water* magazine.

16 **HUMAN SIDE: A New Way to Lead**

To contend with new workplace trends, managers should rethink their traditional roles.

By Ken Wysocky

22 **NASSCO CORNER: Collaboration at Its Finest**

NASSCO works across the industry to ensure CIPP safety.

By Sheila Joy

24 **BETTER MOUSETRAPS: Tackling Odor and FOG**

New mixing aerator system solves problematic lift station's constant issues.

By Suzan Chin-Taylor

30 **TECH TALK: Software Saves Grand Rapids \$1 Billion**

Data from flowmeters helped city officials verify a hunch that sewer issues weren't as bad as models indicated.

By Ken Wysocky

34 **PRODUCT FOCUS: Mainline TV Inspection and Location**

By Craig Mandli

38 **CASE STUDY: Mainline TV Inspection and Location**

By Craig Mandli

40 **PRODUCT NEWS**

Product Spotlight: Manhole chimney seal guards against inflow and infiltration.

By Craig Mandli

42 **INDUSTRY NEWS**

46 **WORTH NOTING**

People/Awards; Learning Opportunities; Calendar

COMING IN APRIL 2020

Hydroexcavation & Industrial Jet/Vac Services

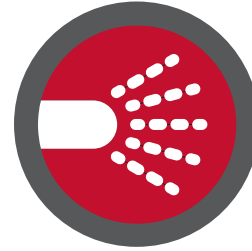
- ◆ **TECH TALK:** Quick fixes to keep your hydroexcavator working
- ◆ **HUMAN SIDE:** Opening students' eyes to industry careers
- ◆ **STAYING SAFE:** The fundamentals of a solid safety approach

MARCH 2020

MUNICIPAL
SEWER
&
WATER



Razorooter® II
Sewer Root Control
Done Right.™



JetPower II®
Grease-Free Sewers,
in One Pass.



iTracker®
Track I/I Quickly
and Cost Effectively.



Trailblazing
Ask About Our
Newest Innovations.














In 1979, Duke's identified a need for root control and became the industry's trailblazer by perfecting chemical root control. Today, Duke's continues to build on that culture of innovation with a range of technology solutions for FOG and I/I that transition clients' operations and maintenance programs from reactive to proactive, saving time and resources.



Visit us at No-Dig Booth #734

dukes.com | 1-800-447-6687

ADVERTISER INDEX

COMPANY	PAGE
3T Equipment Co. Inc.	46
 American Highway Products, Ltd.	39
 Applied Felts, Inc.	11
 Aries Industries, Inc.	15
 Cam Spray	39
Composite Access Products (CAP).....	43
 CUES	23
 Duke's Root Control, Inc.	5
 EnviroSight LLC	2
 Enz USA, Inc.	43
Flomatic Valves	33
 GapVax, Inc.	51
 Gorman-Rupp Company.....	50
 InfoSense, Inc.	37
Krausz USA Inc.	28
McElroy Manufacturing, Inc.	42

COMPANY	PAGE
 NozzTeq Inc.	38
Olsson	21
Petersen Products Co.	47
Pipeline Renewal Technologies.....	17
Piranha Hose Products	28
 RapidView IBAK North America	3
RELINER/Duran Inc.	47
Sauereisen, Inc.	8
 Sewer Equipment Co. of America by Sewer Equipment	29
 Southland Tool Mfg. Inc.	9
Specialty Maintenance Products	45
 SubSurface Locators, Inc.	37
 T&T Tools, Inc.	38
 Vac-Con, Inc.	52
VANAIR	25
Vivax-Metrotech Corp.	45
 WinCan, LLC.....	7
CLASSIFIEDS	48
MARKETPLACE	49

MUNICIPAL SEWER & WATER

FOR SANITARY, STORM AND WATER
SYSTEM MAINTENANCE PROFESSIONALS

Published monthly by:

 COLE publishing

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



www.mswmag.com

© Copyright 2020, COLE Publishing Inc.

No part may be reproduced without permission of publisher.

In U.S. or Canada call toll free 800-257-7222

Elsewhere call 715-546-3346

Email: info@mswmag.com / Fax: 715-546-3786

Office hours Mon.-Fri., 7:30 a.m.-5 p.m. CST

SUBSCRIPTIONS: A one year (12 issue) subscription to *Municipal Sewer & Water™* in the United States, Canada and Mexico is free to qualified subscribers. A qualified subscriber is any individual or company in the United States, Canada and Mexico that maintains, manages, designs or installs municipal or commercial sewer, water and storm infrastructures. To qualify, visit www.mswmag.com or call 800-257-7222.

Non-qualified subscriptions are available at a cost of \$60 per year in the United States and Canada/Mexico. Subscriptions to all other foreign countries cost \$150 per year. To subscribe, visit www.mswmag.com or send company name, mailing address, phone number and check or money order (U.S. funds payable to COLE Publishing Inc.) to the address above. MasterCard, VISA, American Express and Discover are also accepted. Include credit card information with your order.

Our subscriber list is occasionally made available to carefully selected companies whose products or services may be of interest to you. Your privacy is important to us. If you prefer not to be a part of these lists, please contact Nicole at nicole.labeau@colepublishing.com.

CLASSIFIED ADVERTISING: Submit classified ads online at www.mswmag.com/classifieds. Minimum rate of \$25 for 20 words; \$1 per each additional word. All classified advertising must be paid in advance. DEADLINE: Classified ads must be received by the first of the month for insertion in the next month's edition. PHONE-IN ADS ARE NOT ACCEPTED. Fax to 715-546-3786 only if charging to MasterCard, VISA, Discover or AmEx. Include all credit card information and your phone number (with area code). Mail with check payable to COLE Publishing Inc. to the address above. CLASSIFIED ADVERTISING APPEARS NATIONWIDE AND ON THE INTERNET. Not responsible for errors beyond first insertion.

DISPLAY ADVERTISING: Contact Jim Koshuta or Kayla Bisnette at 800-994-7990. Publisher reserves the right to reject advertising which in its opinion is misleading, unfair or incompatible with the character of the publication.



Jim Koshuta



Kayla Bisnette

EDITORIAL CORRESPONDENCE: Send to Editor, *Municipal Sewer & Water*, PO. Box 220, Three Lakes, WI, 54562 or email editor@mswmag.com.

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

CIRCULATION: 2019 average circulation was 37,440 copies per month (U.S. and international distribution).



www.facebook.com/MSWmag
www.twitter.com/MSWmagazine
www.youtube.com/MunicipalSewerWater
www.linkedin.com/company/municipal-sewer-&-water-magazine

This is what it would look like if we printed MSWmag.com
 – THOUSANDS OF STORIES,
 PRODUCTS AND IDEAS.



Get access to everything we can't fit in the magazine.

Additional stories, videos, news briefs and other great information that lets you get the most out of MSW.

 www.mswmag.com



Live demonstrations and operational equipment for the water and wastewater industries!

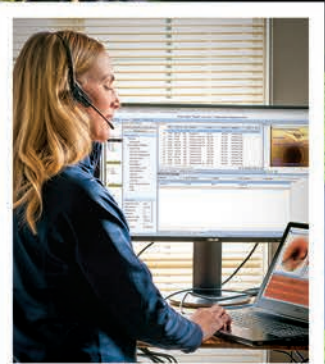
www.weqfair.com
 866-933-2653



Online Insight, Trusted Support

Share your sewer asset data on the cloud effortlessly and securely with WinCan Web. From the moment you sign on, our support specialists guide you toward better insight, better decisions and better teamwork. It's just one more way we never stop innovating.

www.wincan.com/web





Luke Laggis

BE SMARTER THAN THE SQUIRREL

Don't get so caught up chasing a nut that you forget the big picture

I've never cleaned a sewer line. But I'm not afraid to get my hands dirty. One night a few weeks before Christmas, I was cleaning up my kitchen. There was a pot of water on the stove from some shrimp I'd boiled the night before so I dumped it into the sink without a second thought. Left-over shrimp water never smells great. I had hot water running to wash it all down when water started backing up in the other side of the double sink.

I turned on the garbage disposal and was hit with a smell no shrimp could produce. The sinks drained down temporarily, but I quickly learned the line was still clogged and there was water leaking into the cabinet under the sinks.

A bit irritated, I changed my clothes and went out to the garage to locate my hand auger. I found it immediately, which you'd understand is no small feat if you'd ever so much as peered through the window of my garage, and went back inside to take the P-trap apart.

The smell that first came from my sink was nothing compared to what

came out of that pipe when I removed the trap, and neither compared to what was coming.

As I mentioned at the top, I've never cleaned a sewer line, but I'm not bad with the hand auger. From the point where I feed the cable in, the pipe travels about 16 inches before dropping down about 3 feet and then turning to run through the basement ceiling. From there — it's been quite awhile since I've had that ceiling opened up — it feels like there's an elbow about every 2 feet.

On this occasion I could only get the cable in about 12 feet. Initially I thought I was stuck at an elbow or joint, so I pulled the cable back a couple feet and tried to go forward again. That cycle repeated several times. At points it felt like the head of the cable was up against the clog but couldn't get through, and then I kept losing ground.

Finally, I pulled the cable all the way out to inspect the head and start over so I could at least figure out how far in it was. The first time I ran the cable back in, it hit the first elbow and wouldn't go any farther. At that point I knew I had to call a plumber and jerked the cable out. Incredibly, out onto the cabinet floor fell a heavy, slimy lump with what I can only describe as a cartoonlike splat.

In an instant I went from disappointment at the prospect of calling a plumber and being at least temporarily without a kitchen sink, to relief and a bit of pride in having taken care of the problem myself, to being overwhelmed by the stench.

And then ... something caught my eye. The shape. The hair. The tail. It was a flying squirrel.

As it turned out, the squirrel had found its way into the pipes through the vent stack on the roof and fought its way through quite a few feet of pipe before succumbing to the elements. Tough way to go.

Think about that: Just going about your business, climbing into a pipe without fear and then getting stuck and having no way to get out. No way for help to get to you. Stuck against the walls of a dirty pipe. Alone. Knowing you're going to die. Well, we can debate the consciousness level of a squirrel, but it most certainly knew it was in trouble.

Anyway, facing your last moments, taking your last breaths in a sewer line — can you think of a worse way to go?

You're not squirrels, I realize. But you regularly put yourself in harm's way. And you're a lot smarter than a squirrel, so there's no excuse to ever climb down a manhole or into a sewer line without all the proper safety precautions in place.

Confined-space gear, gas monitors, they can save your life. And they're completely worth the hassle. Make sure you can always turn around and get back out if something goes wrong, so you'll never have to get fished out the other end of the pipe.

Be safe, and enjoy this month's issue. ♦



SEWERGARD[®] 210
ULTIMATE CORROSION PROTECTION

Proven Solutions for the Restoration and Corrosion Protection of Wastewater Structures

The SewerGard[®] 210 System offers long term asset protection

100% Solids Epoxy Coatings & Linings

SAUEREISEN

P: 412-963.0303 • info@sauereisen.com • sauereisen.com

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

SOUTHLAND TOOL MFG. INC.

Building Innovative Tools for Municipalities

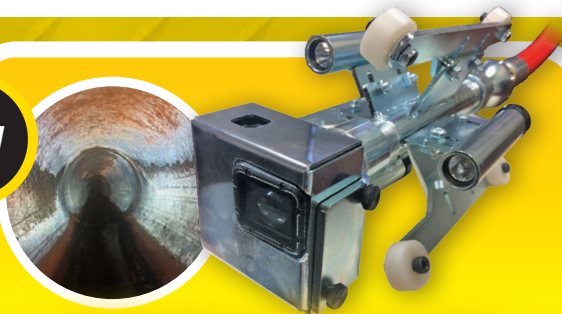


**SOLUTIONS TO SEWER
CLEANING THROUGH:**
CONCEPT
DESIGN
PRODUCTION

wwett Thanks For
Visiting Us



NEW



"ST-PRO CAM" JET CAMERA NOZZLE

Self-leveling GO-PRO 7 CAMERA • Superior illumination
• Stainless steel enclosure • 6"-8" adjustable skids,
nylon wheels (up to 18") • Mini SDI card and card reader,
App readable • Rear 1" thrust nozzle with 8 jets (plugs
included for lower gpm's) • 3 adjustable 1600 lumen LEDS,
3 extra batteries • Wi-Fi integrated wireless,
downloadable to phone app

Pipeline Inspection • Manhole Tools • Debris Baskets • Vac-Traps • Root Saws • Calcium Cutters
Sewer Rods • Handy Clams • Nozzle Extensions • Deep Vac Tube Holder • Grabbers Claws and Hooks
Diamond Tap Cutters • Fiberglass Poles • Hydraulic Cutters • Top Manhole Rollers • Sewer Spoons
Continuous Rod • Carbide Saws • Vacuum Coupling • Reducers • Hydro Excavation



1430 N. Hundley St ph: 714.632.8198
Anaheim, CA 92806 fax: 714.632.8228

YouTube
www.SouthlandTool.com

Visit the site daily for new, exclusive content. Read our blogs, find resources and get the most out of *Municipal Sewer & Water* magazine.

FLOODING CHALLENGES

Dallas' Drainage Tunnel

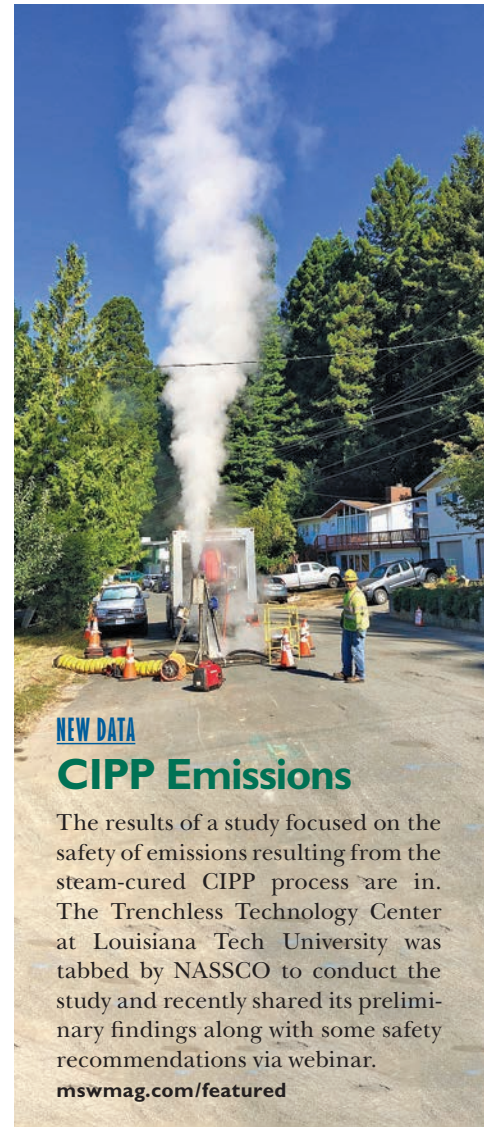
Dallas, Texas' storm sewers, designed and built in the 1930s, are no match for the dense neighborhoods of a 21st-century city. With floods getting worse and more frequent, the city needs a permanent solution. That's why it's digging a giant 5-mile drainage tunnel using a tunnel-boring machine affectionately named Big Tex. mswmag.com/featured



LEAK-DETECTION CANINES

Finding the Right Dog

Water utilities' interest in leak-detection dogs has risen since last year, when it was reported that Central Arkansas Water (CAW) in Little Rock had hired a canine to help sniff out pipe breaks. Some officials in the water sector may be curious about what it takes to find and train such a helpful asset, and trainers Tracy Owen and Carrie Kessler are more than happy to share that information. mswmag.com/featured



NEW DATA

CIPP Emissions

The results of a study focused on the safety of emissions resulting from the steam-cured CIPP process are in. The Trenchless Technology Center at Louisiana Tech University was tabbed by NASSCO to conduct the study and recently shared its preliminary findings along with some safety recommendations via webinar. mswmag.com/featured

OVERHEARD ONLINE

“People are flushing all kinds of things down the toilet that they shouldn't be. It's not a trash can, but people treat it as such.” — *Fictional Homemaker Shares Message About Proper Sewer System Care* mswmag.com/featured



Join the Discussion

Find us at:
facebook.com/MSWmag
twitter.com/MSWmagazine



Emails & Alerts

Visit MSWmag.com and sign up for newsletters and alerts. You'll get exclusive content delivered right to your inbox, and you'll stay in the loop on topics important to you.

WE HAVE YOU COVERED.
NO MATTER WHAT
TYPE OF JOB
YOU NEED TO DO.



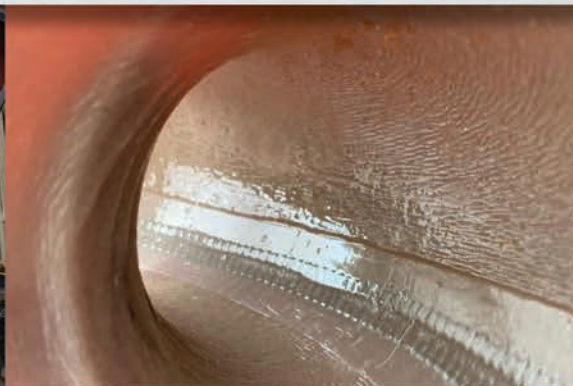
APPLIED FELTS

YOUR SUCCESS IS OUR SUCCESS™



AQUACURE PW

Multi-layer polyester felt/fiberglass hybrid liner
optimized for potable water applications



Applied Felts manufactures custom CIPP liners and calibration tubes for gravity sewer mains, pressure pipe, force mains, potable water, storm sewers and laterals, including vertical applications. We identify and match the finest **PE fibers; PU, PVC, PUXR or PP** coating polymers; fiberglass and other raw materials; and your choice of ambient, water, steam or UV cure. **Pre-impregnated** liners from our newly acquired regional wet-out facilities at **FerraTex Solutions** can make your job easier. No matter what your unique project demands, we've got you covered. Visit appliedfelts.com



AquaCure polyester felt, PU coated,
flame-bonded liner. Ideal for most
gravity sewer applications

Visit us at No-Dig Booth #1020

TAKING CARE OF EVERY DROP

Rapid growth and new technology fuel Tennessee utility's quest for greater efficiency

By Jim Force



When you think of trendsetters, you may have visions of New York, Los Angeles or Chicago.

But in the field of water management, few providers are out in front of the Consolidated Utility District of Rutherford County, Tennessee.

Based in Murfreesboro, the utility is successfully dealing with a rapid population growth through a range of water service improvements totaling more than \$38 million. According to Brett McArdle, communications officer, these improvements include advanced metering technology, upgraded GIS and mapping, leak detection, water quality control, and expansion of

the utility's water conveyance and treatment facilities.

"With our proximity to Nashville, Rutherford County is literally growing overnight," McArdle says. "We're adding 3,000 customers a year and will be at 150,000 in a few years. We're already the sixth largest water utility in the state, and we're poised to grow larger."

Ultimately, customers will benefit. The advancements are designed to produce high-quality water, keep customers informed of water use, and control costs.

Chris Jacobs (left) and lead technician Bryan Harvey of the Consolidated Utility District in Rutherford County, Tennessee, listen for a leak in a water service line. (Photography by Martin Cherry)

The utility

The Consolidated Utility District has grown substantially since its start in 1968, but its motto remains the same: "Take Care of Every Drop."

Today, the utility serves some 60,000 accounts in Rutherford County outside Murfreesboro. Drawing raw water from Percy Priest Lake on the East Fork of the Stones River, the utility treats it to drinking water standards at its K. Thomas Hutchinson Water Treatment Plant, which is being expanded from 16 to 30 mgd (see sidebar).

Treated water flows to customers through more than 1,400 miles of water mains, with 20 pumping stations serving 20 different pressure zones. The utility maintains 12 reservoirs with a total storage capacity of 22.4 mg.

New AMI system

A new metering system is one of the most significant upgrades and will enable the utility to spot leaks on a 24/7 basis and help customers save water and money.

"Right now, we use a drive-by radio read system, which communicates with one-way automated meter reading modules," says Mike Sumner, director of information technology. "We have signed a \$1.3 million contract with Itron, an energy and water resource management company, to improve our metering capabilities from AMR to AMI."

Sumner says the district



PROFILE:

Consolidated Utility District, Rutherford County, Tennessee

FOUNDED:
1968

AREA SERVED:
Rutherford County outside the city of Murfreesboro

CUSTOMERS SERVED:
Approximately 150,000 (60,000 accounts)

INFRASTRUCTURE:
1,400 miles distribution mains;
20 pumping stations and pressure zones;
12 storage reservoirs, 22.4 million gallon capacity; K. Thomas Hutchinson Water Treatment Plant (being expanded to 30 mgd)

STAFF:
William Dunnhill, general manager;
Bryant Bradley, director of operations;
Mike Sumner, information technology director;
Alan Stuemke, engineering director;
Chris Forte, water plant manager

ANNUAL OPERATIONS BUDGET:
\$32 million

WEBSITE:
www.cudrc.com

will start by converting some 13,000 meters — about one-fourth of its customers — to the Itron system by March of this year, with more connections being upgraded over the next three years.

The new meters will be connected to the utility's autodialer and enable the district to notify customers immediately of leaks in their water system.

Eventually, Sumner says, the data will be displayed via a web-based portal system enabling customers to see their usage in real time.

"For a time, we'll be a blended system," says Bryant Bradley, director of operations. "Some of our service area is very rural, and it's not feasible to install AMI there." He estimates that ultimately 60% of the utility's district will be AMI, 40% AMR.

The utility will benefit, too. Bradley explains that many of the district's customers are rental units, which have frequent shut-offs and reconnections as tenants move out and move in.

"The new system is going to save us a lot of trucks and time going to the site," he says. "It will be a huge advantage for us."

Leak detection

Using Sewerin detectors and correlators, the district has maintained an exemplary leak detection program for years and sends crews to other utilities in the state to teach about leak detection. It benchmarks its water loss statistics against com-

"The new system is going to save us a lot of trucks and time going to the site."

Bryant Bradley

parable utilities and focuses on the overnight minimum hourly flow rates entering district metered areas.



Bethany Hall, GIS coordinator, checks the ESRI app on her smartphone.



Matthew Whitten, GIS/GPR technician, sets up a Trimble GNSS receiver to help map underground utilities.

EXPANDING TREATMENT

Customers of the Consolidated Utility District of Rutherford County in Tennessee need more water.

To fulfill that need, the district is nearly doubling the capacity of its K. Thomas Hutchinson Water Treatment Plant, enabling the facility to produce 30 mgd of potable water.

"We've been right at capacity (16 mgd) during the summer months," says Chris Forte, water plant manager. The expanded plant won't add any new technologies but will add on to the treatment train already in place.

Forte says larger high service pumps (Peerless Pump) have already been added, as has a fourth raw water intake, drawing water from Percy Priest Lake on the East Fork of the Stones River.

The old flocculation-sedimentation basins are being rehabilitated, and two more are being added, bringing the total to six.

Twelve new WesTech Engineering filters are being added to the existing 12 dual-media sand and anthracite final filters. The on-site bleach and chlorine dioxide generation facilities are also being expanded to provide disinfection and maintain chlorine residual.

A new solids handling facility was added a few years ago. Process sludge and backwashed filter solids are dewatered on Andritz Separation centrifuges and disposed of on utility-owned land across the street from the treatment plant.

The expansions, totaling over \$15 million, are designed to enable the district to provide drinking water for nearly 500,000 people by the year 2035.

These flows are compared with daytime flow rates and, in rural areas, calculated gallons per minute lost per mile of main to establish and adjust priorities for leak detection and pipe replacement.

With AMI, leak detection will be even faster and more precise, Bradley says. "In years past, the technology would alert us to a leak sometime within a 30-day period. Soon, AMI will alert us within 24 hours. Then we can notify customers that day with a call and a follow-up email."

"Itron gives us lots more technology," Sumner says. "We will have the capability of acoustical leak detection with the meter readings. We'll be able to listen and record data."

Currently, the utility must pull leak data off its SCADA system and put the data into spreadsheets. "We don't do this every day," Sumner says. "It's very labor intensive. We do it every two or three weeks."

GIS and mapping

If Rutherford County residents see drones flying overhead, they may be from their water utility.

"We employ two FAA-certified drone pilots and two drones," McArdle says. "We plan to add thermal

cameras to provide even better leak detection."

He says the drones help increase the accuracy of the district's GIS maps (Esri), yielding high-value snapshots for inventory control and piping.

"We'd taken 30,000 snapshots by the end of 2019," McArdle says. "They provide good images, ensuring accurate maps for our field employees without requiring people to climb around on structures. They're our eye in the sky."

He adds that the utility is working with a developer to build a mobile app

that will feature a personal dashboard with payment and rate information for customers. A wide area network upgrade will allow district employees to access GIS data more quickly.

Water quality and inspections

To increase water quality control, the district has installed zone jumpers and chlorinators at all pump stations. The result is a significant reduction in the amount of flushing needed to maintain quality in pressure zones, says Alan Stuemke, director of engineering. As an example, he points to March 2017, when the district flushed 1.3 million gallons. "In March 2019, we flushed 327,000 gallons."

"We plan to add thermal cameras to provide even better leak detection."

Brett McArdle

Drone operator Pam Sykes (left) and GIS coordinator Bethany Hall set up a flight pattern to map an area in Rutherford County, Tennessee.



“We have a lot of other water quality and inspections personnel visiting our utility to see what we’re doing.”

Brett McArdle

In addition, the district has embarked on a long-term effort to develop a complete district metering area program for the whole county. According to Stuemke, the utility is also deploying new software called Baseform to integrate with the district’s SCADA system, providing even more information about water loss and leaks.

Education is part of the water-quality effort, as well. The district’s water-quality inspectors provide training at functions in Rutherford County, including public schools, and deliver presentations to the Tennessee Association of Utility Districts. Subject matter ranges from guidance for customer service to the science of pressure differentials and water quality.

Main rehabbing

Not all of the improvements in service at the district are so high-tech. The utility continues to upgrade and rehab its 1,400-mile-long water main system.

“We tend to use conventional trench excavation for the vast majority of our pipe replacement projects,” McArdle says. “Ductile iron is our go-to material.”

He says the district uses trenchless technology for road crossings or long lines where the water meter is on the opposite side of the road from the water main.

In addition to providing concrete benefits to its customers and saving time and money for the utility, the district’s improvements and innovations are attracting the attention of others in the industry who stand to gain from its experience.

“We have a lot of other water quality and inspections personnel visiting our utility to see what we’re doing. Plus, we’re providing training to inspectors from around the state,” McArdle says.

“We’re very proud of that.” ♦



Consolidated Utility District General Manager William Dunhill, Director of Operations Bryant Bradley and engineer Alan Stuemke outside the district offices in Murfreesboro, Tennessee.

Rehabilitation

delivering **POWER**

Reinstate Laterals with Power & Precision

The new, electric Wolverine 2.0 cuts through difficult material rapidly and accurately in pipes 6- to 18-inches. Features include:

- Fingertip control for outstanding operator ergonomics
- Adjustable speed and infinite axis motion for accuracy
- Built-in camera lens wiper and scraper for clear view
- 500’ cable reduces truck set-up time

Contact Aries today to see how Wolverine 2.0 is on the cutting edge.

WOLVERINE 2.0 CUTTER

Visit us at:
APRIL 5-9 | DENVER, COLORADO
NO-DIG SHOW
 2020
 DENVER
 APRIL 5-9, 2020
BOOTH #121

raising the bar
UNDERGROUND

ARIES
 INDUSTRIES, INC.

550 Elizabeth Street Waukesha, WI 53186 USA
 800-234-7205 ariesindustries.com

FEATURED PRODUCTS FROM:

Andritz Separation, Inc.
 800-433-5161
www.andritz.com/separation

Esri
 800-447-9778
www.esri.com

Hermann Sewerin GmbH
 888-592-9916
www.sewerin.com

Itron
 866-374-8766
www.itron.com

Peerless Pump Company
 800-879-0182
www.peerlesspump.com

Westech Engineering
 801-265-1000
www.westech-inc.com

A NEW WAY TO LEAD

To contend with new workplace trends, managers should rethink their traditional roles

By Ken Wysocky

Disruptive technologies are buffeting many industries, creating turmoil in markets once considered immune to change. But less obviously, upheaval is also shaking up leadership paradigms.

The upshot: Managers need to sit up and take notice that major changes are looming. Those who are willing to change and adapt will thrive. And those who don't will become obsolete, says Jacob Morgan, the author of a new book, *The Future Leader: 9 Skills and Mindsets to Succeed in the Next Decade*.

"The demands of leadership are very different today than they were even 10 years ago," says Morgan, who also wrote a book called *The Future of Work: Attract New Talent, Build Better Leaders, and Create a Competitive Organization*. "And in the next 10 years, they'll change even more, for leaders at all levels."

"The demands of leadership are very different today than they were even 10 years ago."

Jacob Morgan

Morgan, founder of the Future of Work University (www.futureofworkuniversity.com), reached that conclusion while doing research for his latest book. He interviewed 140 CEOs from around the globe, as well as surveyed 14,000 employees worldwide to figure out where leadership trends are heading.

The results of Morgan's research present an unsettling scenario for managers who are resistant to change and prefer to keep using a traditional top-down managerial style, telling people what to do and making decisions unilaterally from their corner offices.

Why? Based on his interviews with CEOs, Morgan says that artificial intelligence and other technologies will increasingly make decisions for managers. This will eliminate the need for old-school, command-and-control managers.

"Artificial intelligence will effectively eliminate bad managers from organizations," he predicts. "If AI is all about making more accurate and informed decisions, that part of managers' jobs goes away. So if that's all you've focused on as a manager, you become obsolete."

Instead of only making decisions and issuing directives, managers need to focus more on the human element. How well managers engage and empower employees is becoming the new standard by which their performance is measured, he says.

"If you think you're the only one qualified to make decisions, that's a quick way to fail at anything," Morgan notes.

No more status quo

With changes occurring so rapidly in the business world, managers will also have to learn how to lead in the face of uncertainty about where things are headed. This will require embracing new ideas and processes instead of relying on things that worked in the past, Morgan says.

"Managers will need to be comfortable challenging the status quo — with experimenting and testing new things," he explains. "They may even have to test things in a couple of different directions at the same time. They'll need to think about the future in a new way."

To help with this process, managers also must put their egos aside and surround themselves with employees who are smarter and more talented. For many people, that's an uncomfortable thing to do. But in the long run, managers can ill afford to view themselves as sitting at the top of a pyramid with employees down below them; that stereotype is rapidly disappearing.

"Instead, managers need to realize they should be at the bottom of the pyramid, pushing everyone else upward," he continues. "That helps to create the best ideas for services, products, innovations and business opportunities, as well as identifies new market threats."

Bridging the talent gap

CEOs around the world also expressed concern about the growing "talent gap," in which there aren't enough people available to fill demand for jobs. In fact, a 2018 study by organizational consulting firm Korn Ferry predicted this shortfall will hit a total of more than 85 million people worldwide by 2030. The financial impact? A whopping \$8.5 trillion in unrealized annual revenues.

Furthermore, the U.S. Census Bureau predicts that by 2035, there will be more people over age 65 than under 18 for the first time in American history. This will only exacerbate the talent gap.

The takeaway here? Managers must strongly advocate for up-skilling and up-training for existing employees in order to produce the talent they need, Morgan says.

"Managers will also need to know what kind of training is needed — have a good sense of where the world and their businesses are headed," he adds. "They no longer can assume a head-down position."

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.

“I always tell leaders to be transparent as they possibly can.”

Jacob Morgan

In addition, managers will have to focus even more on diversity and inclusion to narrow the talent gap. This includes changing the way they hire, train and retrain their employees.

New employee mentality

Future leaders also must understand that younger employees (think millennials) want more from their jobs than just being drones that perform assigned tasks. They also want purpose and meaning in their work — know that they’re contributing to something greater than themselves, Morgan says.

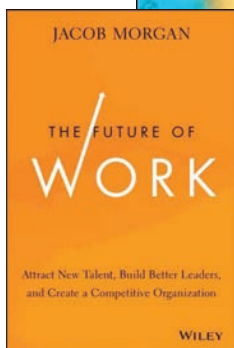
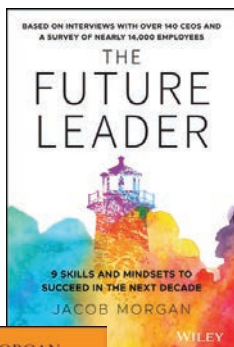
“As leaders, managers need to help employees connect those dots between their roles and the bigger picture ... and understand what they care about and what they value,” he explains. “To do this, you must be an effective storyteller.

“This is very hard to do because it feels a little philosophical and touchy-feely,” he adds. “It’s an emotional kind of thing that some people just don’t feel comfortable doing.”

Along with expecting more meaning from work, employees also want more transparency and higher standards for corporate morality. That means managers must feel comfortable taking a stance on issues so that employees know what they believe in from a moral standpoint, Morgan says.

Old-school managers feel they need to stay neutral and not get involved, but they no longer can afford to “play in the gray areas,” he says. “It all goes hand in hand with transparency — being open and upfront with your team.

“I always tell leaders to be transparent as they possibly can,” he contin-



ues. “Most employees have no idea what’s going on in companies or why. To create trust and a feeling of psychological safety and connection, be as transparent as you can and stop hiding in your company’s hierarchy and bureaucracy.”

Many of the aforementioned trends already are gaining traction in the workplace. As such, it’s imperative for managers who want to stay in the game to recognize these trends and reinvent themselves accordingly. Those who don’t will get practice updating their resumes. ♦

SpeedyLight+ is LED-based

Light Cure

Cures Faster, Relines Bends, No Styrene or Mixing

- Works with many approved felt and glass fiber liners
- Cures up to 3.3 fps over 328'
- Handles bends, transitions
- 3 interchangeable heads for 4–12"
- Single component, off-site wet-out
- Forward-view camera

PRT
Pipeline Renewal Technologies

www.pipelinert.com • 866.936.8476

INSURING A BRIGHT FUTURE

Utah district takes control of lateral lines for the benefit of its collections system and customers

By Giles Lambertson



Sandy Suburban linesman Corey Hudson cleans a sewer line with a Vactor 2100. (Photography by Kim Raff)

“It’s changed people’s lives, people on fixed incomes who have been dealing with failing pipes for years.”

Jerry Knight



Corey Hudson, a linesman at Sandy Suburban Improvement District, checks over a Vactor combo truck before heading out to clean sewer lines.

On the eastern edge of Salt Lake Valley, the Sandy (Utah) Suburban Improvement District sits among similar sewer entities at the base of the Wasatch Mountains. It’s a mature district and percolates along day by day without dramatic changes in the offing.

The absence of drama is deceiving, however, because the district’s transformation has already occurred. It happened six years ago when Sandy Suburban’s elected board instituted a universal insurance program for residential lateral pipelines.

Lateral insurance may not seem transformational. After all, sewer lines, suburbia and insurance are all pretty mundane subjects. Nevertheless, something truly significant happened in Sandy in 2014.

That was when, after years of research, an elected sewer board implemented a plan insuring residents against the threat of house-to-street sewer pipe failure. What’s more, the board set the cost of the insurance for each resident at \$5 a month, a pittance compared to an emergency repair’s price tag. Furthermore, the board declined to raise rates to pay for it.

Jerry Knight, general manager of the district, oversaw implementation of the new district policy and staunchly advocates for it today. Yet Knight was skeptical in the beginning. Renee Christensen, board member, recalls that when the idea of lateral insurance first came up, Knight’s response was, “People just have to pay their own bills. That’s all there is to it.”

Status quo

Sandy Suburban Improvement District is a collections system only, piping 3.5 mgd of sewage to the South Valley Water Reclamation Facility that also serves four other systems. The facility’s 20 mgd of treated water is discharged into the Jordan River, which flows northward until it empties into the Great Salt Lake.

Compared to some older parts of the U.S., the community has relatively young sewer infrastructure comprised of mostly well-maintained clay and concrete pipe. Situated on the western

slope of the Wasatch Mountains, the district moves its wastewater entirely by gravity. Furthermore, the system is 98% built out, so capacity issues are not anticipated in the foreseeable future.

All of this translates into district employees principally maintaining the status quo: keeping the wastewater moving, inspecting pipes for developing obstructions or infiltration, and responding to emergency situations. The district doesn’t even own excavation equipment because there is so little demand for it. When digging — or, for that matter, pipe relining or bursting — is required, the work is bid out.

Sandy Suburban’s fleet of equipment reflects this narrow concentration of tasks. Two Vactor 2100 hydro combo units — 2012 and 2007 models — are the heavyweights Knight calls out for big cleaning jobs. A 2004 Vactor jetter unit on a Sterling chassis complements the bigger rigs. A brand-new RapidView IBAK North America camera system mounted in a Ford E-450 van — and a 5-year-old virtually identical unit — provide eyes in the pipe for maintenance technicians.

“We are set up pretty nice,” Knight says.

Full coverage

Sandy, a community of less than 100,000 people, is part of a Salt Lake City metro area population of more than a million. Its city government is developing a futuristic plan that effectively partitions the city into urban villages, so there is some inkling of civic willingness to try new things.

Perhaps that explains how the Sandy Suburban Improvement District caught the lateral insurance bug. The three-person elected board was exposed to the idea in 2010 after Mark Hurst joined the board. Hurst had served once before and told his new colleagues that the district had a problem that needed addressing: Too many lateral pipes were failing and individual property owners couldn’t afford the cost of rehabbing them.

“We had citizens coming to ask us to pay sewer repair bills,” Christensen says. “We couldn’t justify doing it. We were not in the lateral business.

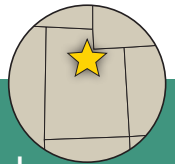
We couldn’t afford to set the precedent of paying for collapsed pipe. That would have been a serious precedent.”

Knight readily agreed with that assessment. Undaunted, the board and general manager began to kick around ideas.

One obvious response was for property owners themselves to buy insurance riders covering the pipes, but that was a “too little too late” proposition for some and a relatively expensive option for all. Nearby Salt Lake City offered its residents this form of lateral insurance as an option, but Knight didn’t believe an optional program was a long-term solution for his smaller district.

“The only people who were going to opt in would be the people who knew they had a problem. An insurance program could only work if no one could opt out.” That is, without everyone contributing to the pool, the numbers wouldn’t work.

As he researched the matter, Knight sought out Rick Lindsey, president of a local agency for Prime Insurance Co. Based



PROFILE:

Sandy (Utah) Suburban Improvement District

WASTEWATER VOLUME:
3.5 mgd

SEWER COLLECTION INFRASTRUCTURE:
165 miles of sewer main, 3,200 manholes

SEWER COLLECTION CUSTOMERS:
10,000 residences

SEWER EMPLOYEES:
13 including office staff

WEBSITE:
www.sandysid.com

BOARD MEMBER AND ACTIVIST

Serving on a sewer improvement board isn't glamorous, yet the work is vitally important to the environmental integrity of communities. Thank goodness for public-spirited citizens who step up.

Renee Christensen is one such person. She is starting her fourth four-year elected term on the governing body of Sandy (Utah) Suburban Improvement District. Early in her tenure, the district conceived and implemented its lateral insurance program, the purpose of which is to reduce the leakage of sewage from lateral pipelines into surrounding soil and water tables.

Though the program has proven itself over five years, it has not caught on with other districts in the Salt Lake Valley or elsewhere in the country. Christensen earnestly advocates for it, but so far with little success.

"Managers love the concept," she says of responses to her lobbying efforts. "They see the benefits. However, political powers in a community look at constraints in their budget and dismiss the idea as an uphill climb they are not fit for. They fear the voice of the people will rise in outcries of 'You want more money from me?' This is a reality in the thought process of elected officials. The lateral program has yet to breach it."

She believes education can resolve the impasse. To that end, she regularly addresses local civic and sewer district officials. Several presentations to officials on the south end of the valley are scheduled for 2020. Jerry Knight, general manager, is advocating similarly but farther afield, across the region and country.

"The lateral insurance program is a proactive way of solving the problem," Knight says. "Government is, by nature, used to being reactionary. Being proactive is a huge step for it. Most officials are just not even willing to try."



Jake Kesler (left) and Corey Hudson set up for a routine sewer cleaning job.

"We want a full repair when it's needed. We don't want a point repair done for, say, \$2,500 if a \$4,500 relining is needed."

Jerry Knight

in Chicago, Prime specializes in custom insurance products such as aircraft, taxicab and inflatable insurance. The conversations between Lindsey and Knight ultimately bore fruit. Nearly four years after the board began its internal discussion, the district finally implemented a plan in 2014.

The custom Prime insurance product for municipalities and special districts is called SWIP, which stands for Sewer and Water Insurance Plans. Each plan is strictly tailored to a sewer or water system. Such customization is key, Knight says. "I can't stress enough how important it is that we were able to customize the program based on our specific needs and fee."

After all the numbers were crunched, Sandy Suburban's insurance plan offered each residential customer lateral insurance for \$5 a month or \$60 a year, a charge eventually incorporated into the district's bimonthly bill. The monthly fee is fixed and separate from periodic rate increases, the last of which occurred 10 years ago.

"I probably could raise the lateral insurance fee and I wouldn't get a lot of complaints because so many people have benefited from the program. It's changed people's lives, people on fixed incomes who have been dealing with failing pipes for years," Knight says.

Holistic approach

After five years, the program data shows how it's working. There have been 762 lateral pipe failure claims, each of which was investigated by a district employee before being forwarded to SWIP. Each failed or blocked line was inspected, cleaned out or repaired as necessary by a contractor, followed by a post-inspection and claim

settlement. Of the 762 claims, 477 resulted in rehab work rather than Band-Aid clean-outs or patches. That's by design.

"We want a full repair when it's needed. We don't want a point repair done for, say, \$2,500 if a \$4,500 relining is needed," Knight says. "And while the contractor is there, we also want a clean-out put in if there isn't one." The holistic approach drove the cost of the average repair job to about \$5,000. Translated, that means customers who individually paid \$300 in premiums over five years would have had their pipes rehabbed at a cost 15 times more than that.

To protect itself against a calamitous series of failed pipe episodes, the district has a stop-loss stipulation, which limits its financial liability to \$15,000 per incident. To protect its reserve, it also limits total district payout over a 12-month period. The limits are not hard and fast, however. On a couple of occasions, rather than defer a project until a new calendar year, the board has approved a repair even though the stop-loss figure for the year was slightly exceeded.

This same flexibility was evident more recently after a resident errantly hired a private contractor to fix a lateral rather than work through SWIP. He ended up with an \$18,000 bill. At the time of this report, the board was leaning toward reimbursing the resident to the extent its insurance plan would have covered it. After all, the district also benefited by having one more lateral upgraded.

This is the dynamic that keeps the program sustainable: As aging laterals are relined or otherwise updated, the need for the insurance declines across the system and financial pressure on the district lessens. Barring a catastrophic event — like, say, an earthquake — a future board might even reduce the \$5-per-home fee as demand for lateral repairs fades.

"My board really pushed for a long-term insurance program, for a complete solution that provided complete repairs. A lot of work went into planning this so it would be sustainable," says Knight, who himself has been a sustainable influence. He began working for the district 34

**“We all are on the same page.
That’s key.”**

Jerry Knight

years ago as the “low man on the totem pole” before becoming general manager in 2007.

The improvement program works in part because the district, insurance company and repair contractors all work together. That teamwork lets them “triage,” as Knight puts it. They set priorities as claims come in and flex as necessary when the money at the end of the year is running out. “We all are on the same page. That’s key.”

Several contractors are called on regularly to perform the lateral work. Matrixx Excavation, a MaxLiner cured-in-place contractor in Sandy, and a local Roto-Rooter plumbing firm most frequently work the lateral jobs. SWIP requires competitive contracting and, according to Knight, has been pleased with the work of its contractors.

Win-win situation

Sandy Suburban was Prime’s first SWIP client and, to date, is its only one. This is interesting because the program has proven fiscally sound and wholly beneficial to both district and residents. It comes close to being a true win-win situation. Yet not even the special districts that surround Sandy Suburban Improvement District are emulating it.

“They are where I was,” Knight says of the reluctance of officials in other districts to offer the program. “You know, they’ll say, ‘It’s not our problem. We don’t want to go into the laterals business.’” That Sandy Suburban has proven both of those assertions wrong doesn’t seem to matter.

Knight was on the program last January at the Fort Worth, Texas, Underground Construction Technology conference. He reported on Sandy Suburban’s response to the problem of aging laterals and recalls it was a packed house. “They had to shut down the meeting finally so the next speaker could come on. Then we had a panel discussion and all the questions were directed to me.”

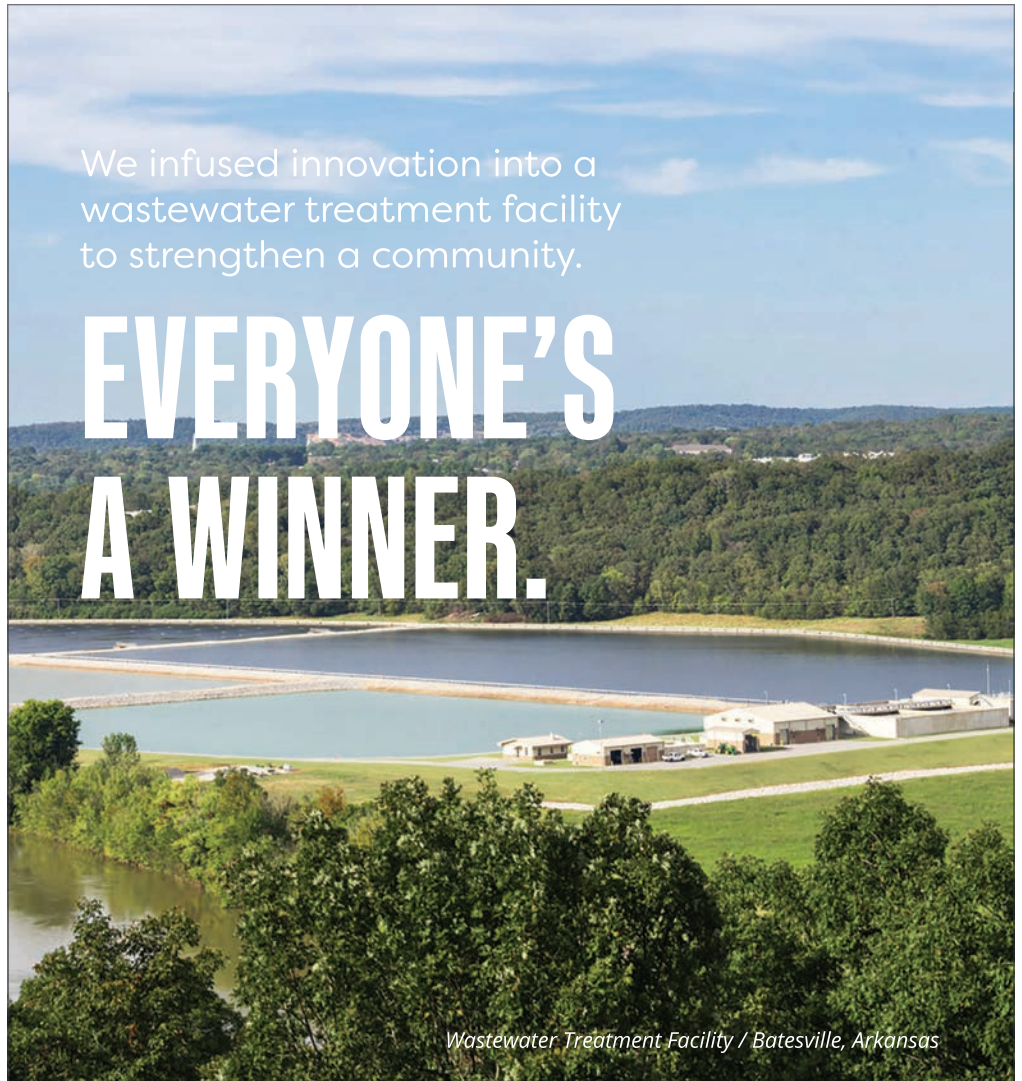
Enthusiasm for the idea remains high. Knight periodically answers calls and emails about the program from elsewhere in the country. Yet to his knowledge no other district or municipality has followed Sandy Suburban’s lead and created its own program. Not yet, anyway. ♦



The Sandy Suburban Improvement District team at their shop in Sandy, Utah.

We infused innovation into a wastewater treatment facility to strengthen a community.

EVERYONE’S A WINNER.



Wastewater Treatment Facility / Batesville, Arkansas

FEATURED PRODUCTS FROM:

MaxLiner USA
877-426-5948

www.maxlinerusa.com

Roto-Rooter Corporation

800-848-3375

www.rotorooter.com

RapidView IBAK North America

800-656-4225

www.rapidview.com

(See ad page 3)

Vactor Manufacturing

800-627-3171

www.vactor.com

olsson®

We’re Olsson, engineers who understand that where there’s a project, there’s a purpose. See how our bio-tech approach upgraded key infrastructure in Batesville, Arkansas, at olsson.com.

COLLABORATION AT ITS FINEST

NASSCO works across the industry to ensure CIPP safety

By Sheila Joy

When published reports questioned the safety of chemical emissions of styrene-based resin used in cured-in-place pipe, NASSCO sprang into action to do its part to learn more and ensure the protection of workers and residents in the communities we serve.

The first step was to form a CIPP safety work group under NASSCO's Pipe Rehabilitation Committee. The work group brought together NASSCO members and other industry organizations including the American Composites Manufacturers Association, North American Society for Trenchless Technology, NSF International, The Water Research Foundation and Water Research Centre. The intention was to better understand potential health risks via thorough research.

The work group, bringing together the expertise of the world's most respected organizations in this field, prepared requests for proposals for a two-phase study:

Phase One: Awarded to the University of Texas at Arlington Center for Underground Infrastructure Research and Education and the Institute for Underground Infrastructure in Germany, the four-month study focused on the review of published literature pertaining to chemical emissions of styrene-based resin used in CIPP. The resulting report found that existing studies do not adequately capture worker exposures or levels in the surrounding areas to which workers or citizens may be exposed. The CUIRE team also developed a robust scope of work for capturing and analyzing CIPP emissions data.

Phase Two: The second RFP received many responses and was awarded to

the Trenchless Technology Center at Louisiana Tech University, in partnership with the Army Corps of Engineers, to carry out the scope of work defined by CUIRE. The primary project objectives were to (1) measure and quantify worker/public exposure and (2) evaluate potential health risks to workers and the public due to CIPP emissions.

TTC's field study included six different test sites in Shreveport, Louisiana; Aurora, Colorado; and St. Louis. Tests were conducted in a variety of weather and geographic conditions on a variety of pipe lengths and diameters ranging from 6 to 36 inches. Evaluation of potential health risks to workers and the surrounding community for this study were based on published regulatory guidelines from the Centers for Disease Control and Prevention, the National Institute for Occupational Safety and Health, and the Occupational Safety and Health Administration. A webinar conducted by TTC with initial findings and recommendations can be found at www.nassco.org/news. The full reports from CUIRE and TTC are also available at www.nassco.org.

Safety is paramount to NASSCO, and we know the findings of these studies are just the beginning. Therefore, the industry is coming together to collaborate once again via NASSCO's CIPP safety work group to identify areas for additional research, update safety guidelines and — above all — keep workers and our communities safe.

For more information or to become part of this important work group, please email NASSCO's executive director at director@nassco.org. ♦

NASSCO (National Association of Sewer Service Companies) is

located at 2470 Longstone Lane, Suite M, Marriottsville, MD 21104; 410-442-7473; www.nassco.org

Sheila Joy is executive director of NASSCO. She can be reached at director@nassco.org.

Get the EDGE Training and Continuing Education Courses

PACP TRAINING

March 9

Frederick, MA
Includes: LACP, PACP, MACP
Trainer: Rizwan Siddiqi
443-739-9234 • rasiddiqi@gmail.com

March 10

Phoenix, AZ
Includes: LACP, PACP, MACP
Trainer: Marilyn Shepard
916-899-8961 • mshepard1@hotmail.com

March 10

Lawrenceville, GA
Includes: LACP, PACP, MACP
Trainer: John Jones
678-527-4212 • plumblineconsultant@gmail.com

March 10

Kansas City, MO
Includes: MACP, LACP, PACP
Trainer: Jerry Weimer
513-659-5008 • jerryweimerconsulting@gmail.com

March 10

Maumee, OH
Includes: PACP, MACP, LACP
Trainer: Brandon Conley
574-201-7704 • brandonconleypacp@gmail.com

March 11

Evansville, IN
Includes: ITCP - CIPP
Trainer: Gerry Muenchmeyer
252-626-9930 • gerry@muenchmeyerassoc.com

March 11

Kansas City, MO
Includes: ITCP - Manhole Rehabilitation
Trainer: Tim Back
513-253-8461 • timbacktwo@gmail.com

March 16

Timonium, MA
Includes: LACP, PACP, MACP
Trainer: Irvin Gemora
410-458-9591 • irv.gemora@gmail.com

March 17

Raleigh, NC
Includes: PACP, MACP, LACP
Trainer: Paul Booth
704-681-3989
woodsdeenv@gmail.com

March 17

Lebanon, NH
Includes: PACP, MACP, LACP
Trainer: Lindsey Sylvester
6March 606-4436
lindsey.sylvester@wright-pierce.com

March 17

Evansville, IN
Includes: ITCP - Manhole Rehabilitation
Trainer: Tim Back
513-253-8461 • timbacktwo@gmail.com

March 18

Frisco, TX
Includes: PACP, MACP, LACP
Trainer: Jerry Weimer
513-659-5008 • jerryweimerconsulting@gmail.com

March 23

Wichita Falls, TX
Includes: LACP, PACP, MACP
Trainer: Bryan K. Ballard
918-645-1748 • ballardbs@icloud.com

March 24

Durham, NC
Includes: MACP, LACP, PACP
Trainer: Paul Booth
704-681-3989
woodsdeenv@gmail.com

March 24

Ann Arbor, MI
Includes: MACP, LACP, PACP
Trainer: Brandon Conley
574-201-7704 • brandonconleypacp@gmail.com

March 31

Fresno, CA
Includes: PACP, MACP, LACP
Trainer: Marilyn Shepard
916-899-8961 • mshepard1@hotmail.com

March 31

Solon, OH
Includes: PACP, MACP, LACP
Trainer: Brandon Conley
574-201-7704 • brandonconleypacp@gmail.com

April 2

Gainesville, FL
Includes: ITCP - Manhole Rehabilitation
Trainer: Tim Back
513-253-8461
timbacktwo@gmail.com

NASSCO PRO TRAINING

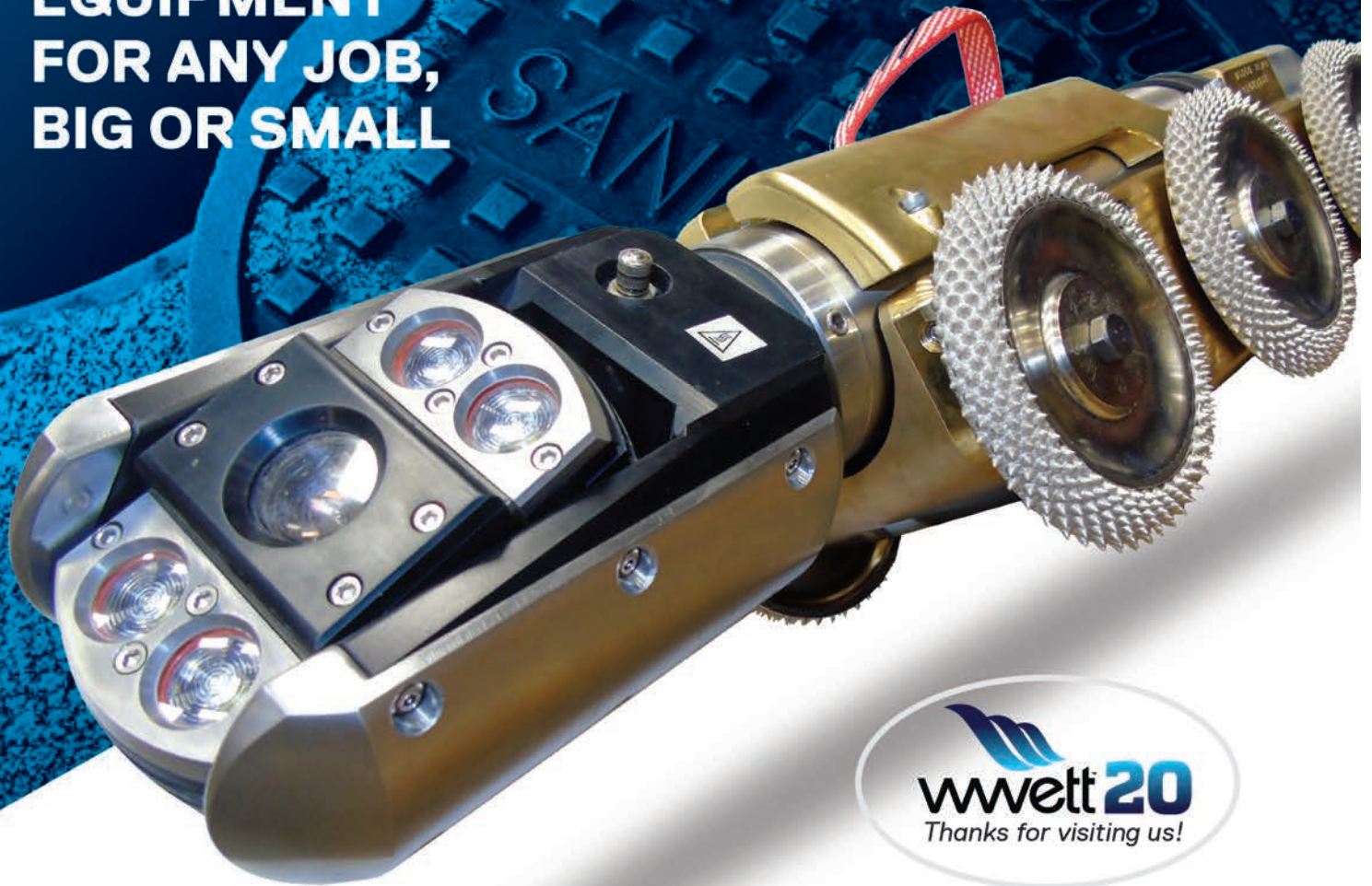


OTHER CLASSES FORMING

Contact one of the trainers listed above if you are interested in having a class at your facility or in your area.

**PIPELINE
INSPECTION
EQUIPMENT
FOR ANY JOB,
BIG OR SMALL**

CUES 



ABOUT CUES

As the world's leading manufacturer of water, wastewater, and stormwater inspection equipment, CUES provides the necessary tools for both pipeline inspection and repair. For 50+ years, CUES has manufactured the most rugged and reliable pipeline inspection equipment in the industry.

WHY CHOOSE CUES

- Industry-Leading Customer Service
- Innovative Products Designed for Rigorous Field-Use
- Technical Service & Parts On-Hand To Keep You Up and Running with 24-Hour Turn-Around
- Locations & Support Staff Around the World
- Next-Generation GraniteNet Software
- Broadest Product Line Available on the Market

Call today for a free demo!

www.cuesinc.com | 800.327.7791 | salesinfo@cuesinc.com



TACKLING ODOR AND FOG

New mixing aerator system solves problematic lift station's constant issues

By Suzan Chin-Taylor

Yuba City, California, like most cities across the nation, has experienced growth. Parts of its sanitary collections system are now being asked to perform at top capacity and handle more than their fair share of conveyance on a daily basis.

In one such structure, this was creating the ongoing challenge of fighting odor issues without a long-term resolution and with a never-ending maintenance expense. Accepting an offer of a pilot test unit for a new technology designed for wastewater treatment plants is showing itself to be the answer Yuba City has been waiting to incorporate for decades.

Long history

Serving a population of approximately 72,000 with a system comprised of 200 miles of sewer main, 2,400 manholes and 17 operational lift stations, Yuba City's small and efficient collections team has a full plate of work. Tim Bybee, wastewater collection supervisor, and Diana Langley, Public Works director, wanted to see one task eliminated: the weekly cleaning and constant maintenance of Lift Station No. 2.

Built in the early 1950s, the lift station was originally designed to act as the city's wastewater treatment plant. Then in 1979 when the city's new treatment plant came online, the structure was converted into a lift station. In 1992 it was upgraded with three 30 hp submersible pumps, each capable of pumping 800 gpm. Despite the upgrade, the system is pushed to the limit, responsible for moving an average of 2-3 mgd.

Odor issues became prevalent in the lift station over time, so in 1991 a charcoal filtration unit (Purafil - a Filtration Group Co.) was installed. The charcoal system worked for a while, but as the city grew and more flow came through, the unit was not able to keep up with demand and odor became a routine issue.

The right answer

The maintenance team began a preventive maintenance program of replacing the charcoal in the unit annually, but this became challenging as the material was difficult to procure and became increasingly more expensive. Chemical odor control methods were then considered, but these also were costly and carried safety liability for storage and handling.

"Director Langley challenged us to search out a long-term solution and consider other technology," Bybee says. "She opened my eyes and view of our current system — that a solution you start with may simply become obsolete for your situation. It doesn't mean that it isn't a good solution; it just isn't the right answer to meet the current needs."

While they hunted for new options to combat the odor, crews were dispatched to clean the lift station with a jet/vac truck on a weekly basis.

The crews extracted on average 1,000 gallons of FOG per week. They also adjusted pump controls, lowering the pump on offset points to reduce detention time. This resulted in minimal odor improvement and created the potential of ragging up the pumps. In the long run, adjusting the pump controls as a solution was not successful and was abandoned. Even with this valiant effort, and an annual cost of nearly \$70,000, the odor persisted.

Pilot test

Bybee had been in conversation with Lewis Titus of Titus Industrial Group about various wastewater technologies they offer when the subject of odor control systems came up. Upon hearing about Yuba City's issue, Titus was confident he had a solution with their TITUS Twister Mixing Aerator.

"I was skeptical," Bybee says. "I deal with a lot of different vendors, and sometimes it feels like it's just another sales pitch. But Lewis was adamant that we had to try it and so confident it would work that he offered to bring

BETTER MOUSETRAPS

PRODUCT:
TITUS Twister Mixing Aerator

MANUFACTURER:
Titus Industrial Group
541-389-1975
www.titusig.com

APPLICATION:
Regenerative blowers,
enhanced with ozone
generation

BENEFITS:
Odor was gone, FOG was
reduced 95%, ragged up pumps
eliminated

USER:
Yuba City, California



Yuba City initially demoed a trailer-mounted TITUS Twister, with a Twister head, regenerative blower and enclosure, and set it up next to the lift station.

us a pilot unit to try at no cost. My director felt we had nothing to lose so we agreed.”

Titus delivered a trailer-mounted TITUS Twister and set it up next to the lift station. The patented system consists of a Twister head, regenerative blower and enclosure. The Twister heads are comprised of stainless steel manifolds, stainless steel ballast plates, PVC barrels, HDPE shear blades, HDPE horizontal flow deflector plates and stainless steel coupling connections. The head is connected to the blower by either EPDM hose or stainless steel hard piping. For the Yuba City application, two Twister heads were installed into the wet well, driven by two 3 hp regenerative blowers, and enhanced with ozone generation.

Air is generated by the regenerative blower inside the trailer enclosure. The air is then delivered to the aeration units and through the manifold in the lift station through two EPDM hoses. In the Yuba City unit, a 40-gram-per-hour corona discharge ozone generator was used to produce ozone from the ambient air. This was incorporated to enhance the unit’s odor control properties. Openings in the manifold create air bubbles that transfer oxygen and ozone into the effluent.

Within the unit’s barrel, an air lift column is created. That forces liquid and solid materials up into the static shear blades and flow deflector plate. Solids are broken up and directed back into the cycle. Liquid and solid materials are continuously drawn in through ports located at the bottom of the barrel, creating a constant suspension of materials within the lift station.

“Within the first hour, even running at half capacity, everyone who was present concluded that this was the technology we needed: The odor was gone. Pumpouts for the FOG matter have been reduced 95%, and ragged up pumps have been eliminated,” Bybee says.

Permanent solution

Bybee presented the results to Langley, and they were taken to city council and approved for purchase. The city is now installing a TITUS Twister Mixing Aerator into a permanent structure adjacent to the lift station.

The Twister’s aboveground components will be housed where the original odor control system was, alongside other control equipment for the lift station. The building is being rehabilitated for this purpose, and instead of the EPDM hoses used during the demonstration and trial, (in conjunction with the trailer-mounted version) stainless steel piping will be run underground into the side of the lift station and onto the heads directly in front of the aeration pumps.

Once the building renovation is complete and the permanent equipment is installed, the city investment will be approximately \$85,000.

“We actually predicted that between the maintenance equipment operation costs, the charcoal unit upkeep and labor we were putting in, this new unit will almost pay for itself in one year,” Bybee says. “I wish we had tried it sooner, and we’re glad that Titus had so much confidence in their system and gave us the opportunity to take it for the test drive.”

“Within the first hour, even running at half capacity, everyone who was present concluded that this was the technology we needed: The odor was gone.”

Tim Bybee



The Yuba City crew at the site of a problematic lift station where a TITUS Twister Mixing Aerator was installed to eliminate odor issues.

The Biggest Advancement in PTO Underdeck Systems in 50 Years!

In 1972, Vanair® invented the PTO shaft-driven, vehicle mounted, rotary screw air compressors. Today, we continue to advance the industry with our newly-designed underdeck power system. The innovative features we’ve developed, include:

Patent Pending FailSafe™ Dual Sensor Redundancy System

Patent Pending ThermalGuard™ Weather Protection Kit

UltraLife™ 6000 Hour Air/Oil Separator Element

Advanced Separation Tank

Redesigned V-TEC® II Display and Compressor Control System

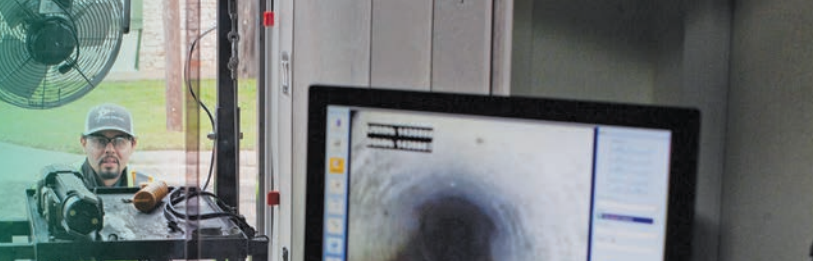
New Brushless Fan Cooler Package


No other manufacturer offers these advanced technologies, ensuring the highest reliability and lowest life cycle cost for your fleet. These innovative features, plus the weight and space reduction, ease of use, and greater mobility you’ve come to expect from the Vanair® underdeck PTO make it the perfect choice for increased uptime.



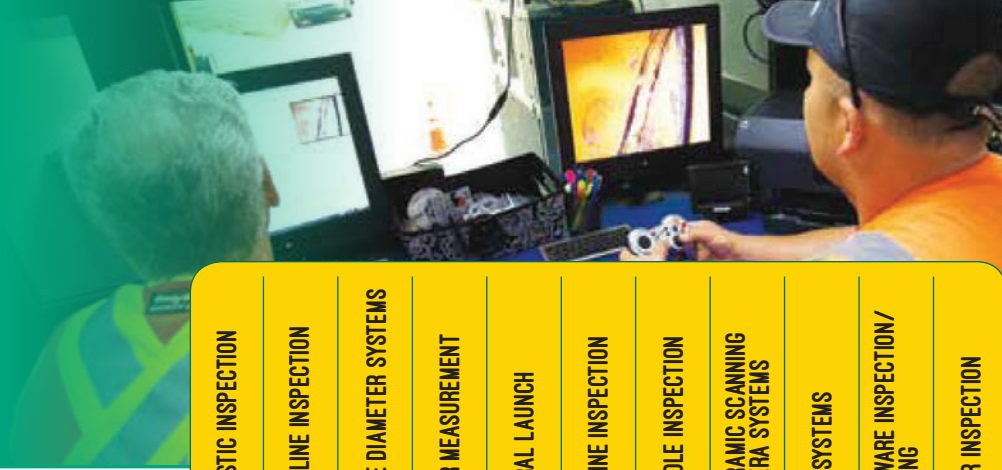
**Call 800-526-8817 to arrange a demonstration.
Learn more at vanair.com/news**

2020 TV/VIDEO INSPECTION & LOCATION DIRECTORY



	ACOUSTIC INSPECTION	DRAINLINE INSPECTION	LARGE DIAMETER SYSTEMS	LASER MEASUREMENT	LATERAL LAUNCH	MAINLINE INSPECTION	MANHOLE INSPECTION	PANORAMIC SCANNING CAMERA SYSTEMS	PUSH SYSTEMS	SOFTWARE INSPECTION/MAPPING	SONAR INSPECTION
 <p>Aries Industries, Inc. 550 Elizabeth St., Waukesha, WI 53186 800-234-7205 www.ariesindustries.com sales@ariesindustries.com</p>		Yes	Yes	Yes	Yes	Yes			Yes	Yes	
 <p>CUES, Inc. 3600 Rio Vista Ave., Orlando, FL 32805 800-327-7791/407-849-0190 Fax: 407-425-1569 www.cuesinc.com salesinfo@cuesinc.com</p>		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
 <p>Electric Eel Mfg. Co., Inc. 501 W Leffel Ln., Springfield, OH 45501 800-833-1212/937-323-4644 Fax: 937-323-3767 www.electriceel.com msperanza@electriceel.com</p>		Yes				Yes					
 <p>Envirosight 111 Canfield Ave., Ste. B3, Randolph, NJ 07869 973-252-6700 Fax: 973-252-1176 www.envirosight.com mail@envirosight.com</p>		Yes			Yes	Yes	Yes		Yes	Yes	
 <p>EPL Solutions, Inc. 1330 W Collins Ave., Orange, CA 92867 714-453-9760 www.epls-usa.com sales@epls-usa.com</p>		Yes				Yes			Yes		
 <p>General Pipe Cleaners 1101 Thompson Ave., McKees Rocks, PA 15136 800-245-6200/412-771-6300 www.drainbrain.com info@drainbrain.com</p>	Yes	Yes							Yes		
 <p>InfoSense, Inc. 8116 S Tryon St., Charlotte, NC 28273 877-747-3245 Fax: 704-930-0145 www.infosense.com dryu@infosense.com</p>	Yes									Yes	
 <p>MyTana LLC 746 Selby Ave., St. Paul, MN 55104 800-328-8170/651-222-1738 Fax: 651-222-1739 www.mytana.com mytana@mytana.com</p>		Yes							Yes		
 <p>Pearpoint Inc. 39-740 Garand Ln., Unit B, Palm Desert, CA 92211 800-688-8094/760-343-7350 Fax: 760-343-7351 www.pearpoint.com/en-us pearpoint.sales.us@spx.com</p>		Yes				Yes			Yes		

2020 TV/VIDEO INSPECTION & LOCATION DIRECTORY



	ACOUSTIC INSPECTION	DRAINLINE INSPECTION	LARGE DIAMETER SYSTEMS	LASER MEASUREMENT	LATERAL LAUNCH	MAINLINE INSPECTION	MANHOLE INSPECTION	PANORAMIC SCANNING CAMERA SYSTEMS	PUSH SYSTEMS	SOFTWARE INSPECTION/MAPPING	SONAR INSPECTION
 Pipeline Renewal Technologies 111 Canfield Ave., Ste. B3, Randolph, NJ 07869 866-936-8476/973-252-6700 www.pipelineret.com mail@pipelineret.com See Ad Page 17		Yes							Yes		
 RapidView IBAK North America 1828 W Olson Rd., Rochester, IN 46975 800-656-4225 www.rapidview.com sales@rapidview.com See Ad Page 3		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Ratech Electronics, Ltd. 260 Spinnaker Way, Ste. 7, Vaughan, ON L4K 4P9 CANADA 800-461-9200/905-660-7072 Fax: 905-660-1519 www.ratech-electronics.com sales@ratech-electronics.com		Yes				Yes	Yes		Yes	Yes	
Sewer Equipment Co. of America by Sewer Equipment 1590 Dutch Rd., Dixon, IL 61021 888-477-7611 www.sewerequipment.com sales@sewerequipment.com See Ad Page 29		Yes	Yes			Yes					
 Spartan Tool, LLC 1506 W Division St., Mendota, IL 61342 800-435-3866 www.spartantool.com sales@spartantool.com		Yes				Yes			Yes	Yes	
Subsite Electronics 1950 W Fir St., Perry, OK 73077 800-767-1974 www.subsite.com info@subsite.com		Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
The Safety Company LLC, dba Mtech Company 7401 First Place, Oakwood Village, OH 44146 800-362-0240/440-646-0996 Fax: 440-646-9953 www.mtechcompany.com sales@mtechcompany.com See Ad Page 49		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vivax-MetroTech Corp. 3251 Olcott St., Santa Clara, CA 95054 800-446-3392/408-734-1400 www.vivax-metrotech.com salesUSA@vxmt.com See Ad Page 45						Yes			Yes	Yes	
 WinCan 300 Cedar Ridge Dr., Ste. 308, Pittsburgh, PA 15205 877-626-8386 www.wincan.com/en mail@wincan.com See Ad Page 7										Yes	

HYMAX INDUSTRIAL SOLUTIONS

Resilience that Makes the Difference!



HYMAX[®]
Repair the past. Connect the future.
KRAUSZ is the creator of HYMAX

Please contact Pete Brown
Email: Pete.Brown@krauszusa.com
T: 352-453-0150 M: 352-817-1295
www.krauszusa.com

FEATURES

- 2 Bolt design ----->
- Integrated Restraint ----->
- Premium Materials ----->
- Continuous Dynamic Deflection ----->

BENEFITS

- Quick and simple, reducing installation costs
- No additional mounting hardware required
- Durable and re-usable with multiple material options
- Reduce future breaks

PIRANHA SWAGE TOOLING FAMILY

SWAGE-HYDTH

1/8" - 1 1/4"

SWAGE-LLTH

1/8" - 1/2" Ends Only

SWAGE-HANDTH

1/8" - 1 1/4"

All Units are Serial
Numbered



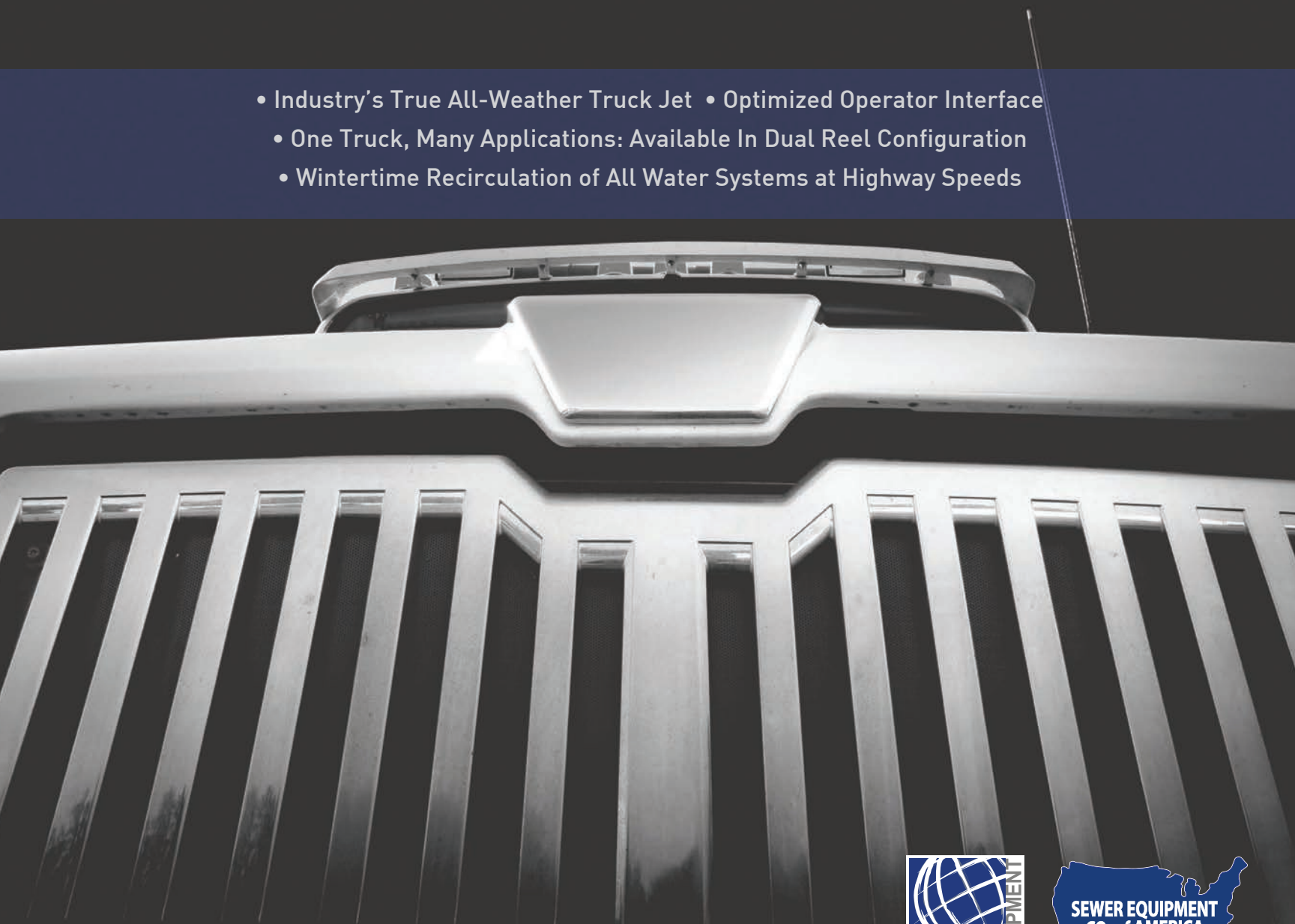
Contact Piranha Hose Products for a distributor near you
orders@piranhahose.com | 800.250.5132



WE WANTED TO NAME IT **"THE BAD ASS"** BUT WE COULDN'T GET IT PAST LEGAL.

Fortunately, our engineers have more cojones than our lawyers, which is how we arrived at the new, all-weather 800-HPR Series IV truck jet.

- Industry's True All-Weather Truck Jet • Optimized Operator Interface
- One Truck, Many Applications: Available In Dual Reel Configuration
- Wintertime Recirculation of All Water Systems at Highway Speeds



sales@sewerequipment.com / 1.888.477.7611 / sewerequipment.com



SOFTWARE SAVES GRAND RAPIDS \$1 BILLION

Data from flowmeters helped city officials verify a hunch that sewer issues weren't as bad as models indicated

By Ken Wysocky


By using sensors to collect real-time data about the performance of sanitary sewers and a specialized software program to analyze the intel, the city of Grand Rapids, Michigan, avoided an estimated \$1 billion worth of system upgrades that reports indicated would be needed to ensure compliance with state mandates.

The data was collected by a network of 90 flowmeters and 10 rain gauges deployed around the city in 2013 and analyzed by a BLU-X Intelligent Urban Watershed platform from Xylem Digital Solutions. The upshot? The infiltration and inflow problems could instead be solved for between \$30 million to \$50 million, says Nicole Pasch, the acting assistant environmental services manager for the city's Environmental Services Department.

"The real-time sensors turned on the lights," Pasch says. "We used the technology to clarify and prove things. It was risky to spend \$2 million to deploy flowmeters out there, but if we hadn't, it would've affected the affordability of our water and sewer services in a very negative way."

The city's journey to using the sensors and the analytical software actually started back in 1991. That's when Grand Rapids embarked on a 27-year-long, roughly \$400 million endeavor to convert its 100-year-old combined sewers into separate stormwater and sanitary sewers. Overall, the city installed about 119 miles of new storm and sanitary sewer lines in a 4.7-square-mile area and separated 99.5% of the old combined sewer network.

Sewer overflows during heavy rains had plagued the city for decades. During 1969, for instance, 12.6 billion gallons of untreated sewage flowed into the Grand River, which empties into Lake Michigan some 40 miles downstream. And in 2013, record flooding sent 435 million gallons of untreated sewage into the river, according to news reports.



The Grand River in Grand Rapids, Michigan, was in bad shape years ago from sewer overflows caused by excess inflow and infiltration. A robust network of flow meters and rain gauges analyzed by a BLU-X Intelligent Urban Watershed platform has helped clean up the problems.

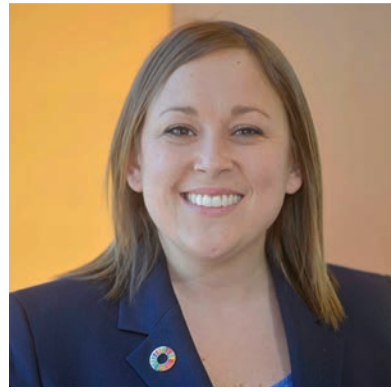
“The real-time sensors turned on the lights. We used the technology to clarify and prove things.”

Nicole Pasch

In fact, the situation was bad enough that in 1988, state authorities imposed a ban on real estate development until the sewer problems were fixed. The state also ordered the city to fix the sewer overflow problem by 2019.

Surprising news

After the sewer-separation project concluded, the city was required to prove it could comply with a mandate from the Michigan Department of Environmental Quality to eliminate overflows in the new sanitary sewers. The only exception to the mandate was a rainstorm that would exceed a



Nicole Pasch is the acting assistant environmental services manager for Grand Rapids' Environmental Service Department.

24-hour, 25-year storm, about the equivalent of almost 4 inches of rain in an hour, Pasch says.

“Even though we already spent \$400 million to separate the sewers and no longer have any sewage overflow, we still have to go through the regulatory requirement to show we won't have any sanitary system overflows,” Pasch explains.

When the hydraulic modeling test was completed, the results took officials by surprise. The data indicated that the city still needed to remove 175 million





An aerial view of Grand Rapids' wastewater treatment plant.

gallons of I&I from the system annually. At a cost of \$5 to \$7 per gallon for such projects, the total estimated price tag came out to around \$1 billion, Pasch says.

“After reviewing the results, it was surprising that the hydraulic model indicated there were more areas that still needed work, including some areas we had already addressed,” she says. “The model predicted much bigger issues with certification than we ever thought possible.”

Following a hunch

At that point, officials faced a choice: Accept the results of the hydraulic model or follow a gut hunch that the modeling was somehow flawed. They elected to go with the latter, and to verify their hunch, the city hired EmNet (now owned by Xylem) to deploy the flow sensors in 2013.

“The more we worked with EmNet, the more we realized that they’re

“Grand Rapids is one of the most advanced cities in the country. They’re way ahead of the game in terms of making necessary investments in sewers.”

Tim Braun

very experienced in modeling and collecting system intelligence,” Pasch says. “So we hired them to develop a more realistic model.”

The centerpiece of EmNet’s efforts was the BLU-X platform, which collects, organizes, analyzes and displays the data via dashboards. That provides municipal officials with visual cues to understand and regulate the operation of their sewer systems. Once a baseline model was established, this “smart” system continually compares

it against ongoing sensor data, which continuously fine-tunes the model with each rainfall.

“The model is built on a software platform that is basically a series of mathematical relationships that represent the entire sewer system,” says Tim Braun, vice president and enterprise architect at Xylem Digital Solutions. “It models how all the pipes intersect, their slopes and diameters — really anything that impacts how water flows through the system.

“BLU-X helps you understand the physical locations of the problem and characterizes the behavior of a sewer system,” he adds. “This helps you understand the location of the biggest pain points, and knowing that helps you make far more strategic decisions.”

Not as bad as expected

The flowmeter data analytics provided by the BLU-X platform narrowed the problem areas suggested by the hydraulic study to only six sites. And even those six sites struck city officials as odd because during the major flooding that afflicted much of the Midwest in 2016, none occurred in the areas that the data predicted would suffer most, Pasch says.

“We took all that data from the flowmeter network and used it to show where they were getting the most inflow from direct connections, as well as groundwater infiltration,” Braun says. “That body of data and analytics was very different from what the hydraulic model said should’ve been happening.”

After moving flowmeters to new locations and analyzing more data, the city narrowed down the problem sites to just three. “That’s where the real story is,” Pasch explains. “It’s all about trusting your experience and your gut about the aberrations.

“A basic hydraulic model is very conservative, so we took the next step of putting meters out there and getting real data,” she continues. “Then the modeling advanced to a neural network and from there to a genetic algorithm model.

“Using those kinds of advanced mathematical computations allows the system to calibrate more and more to what it actually sees, rather than relying on theoretical computations.”

Verify with data

So what’s the takeaway here for other municipal officials? “As an operator, you know your system, so sometimes you have to follow your gut instincts and verify them with data,” Pasch notes.

The data collected and the ensuing analytics allowed the city to make an intelligent and articulate case to the state Department of Environment, Great Lakes and Energy to avoid spending \$1 billion in sanitary sewer improvements, Braun says, while still meeting its sewer performance requirements and environmental objectives.

Looking ahead, the city has installed 70 more sensors, this time primarily in storm sewers. The data collected by the sensors will help Grand Rapids officials understand the city’s overall impact on the Grand River and identify what projects will yield the highest return on investment as they pertain to water quality in the river and its tributaries.

“Grand Rapids is one of the most advanced cities in the country. They’re way ahead of the game in terms of making necessary investments in sewers,” Braun notes.

In the meanwhile, the city has completed the project-performance certification process to demonstrate that all the separated sewers meet state mandated requirements. The storm sewers are certified, but the sanitary sewers certification is pending.

“The city submitted a project-performance certification work plan (for the sanitary sewers) at the end of 2019, and we expect it will be accepted,” Pasch says. “That will save the city hundreds of millions of dollars by using the updated model and real-time data.

“We could’ve spent \$1 billion,” she concludes. “But instead, we found a better and more cost-efficient way.” ♦

Since 1933 - High Quality Valves, Built To Last...

FLOMATIC® VALVES

WATER AND WASTEWATER VALVE EXPERTS



As a diversified **U.S valve manufacturer**, producing valve products in many sizes and ranges, Flomatic Valves are specified in some of the largest **water and wastewater** projects in the country. Most of our products are both NSF/ANSI 61 & 372 certified, and many are compliant with the American Iron and Steel Provision (AIS). **Quality and performance** are the most important part of our business, just as you are. So when seeking to specify valve products for your next application, **think Flomatic Valves – a partner you can trust.**



ISO 9001 ISO 14001

FLOMATIC CORPORATION 15 PRUYN'S ISLAND DR, GLENS FALLS, NY 12801
800-833-2040 WWW.FLOMATIC.COM

Manufacturer under certified quality and environmental systems

MAINLINE TV INSPECTION AND LOCATION

By Craig Mandli

CRAWLER CAMERAS

Aries Industries Mobile Pathfinder System



The **Mobile Pathfinder System** from **Aries Industries** is a lightweight, portable system for accurately inspecting mainlines 6 inches or larger. It includes a powerful transporter, camera and lightweight reel; these components are operated by an all-in-one remote control. The transporter comes in a variety of wheel sizes and is equipped with a rear-viewing camera and an adjustable electric lift to keep the camera centered in a range of pipe sizes. It features a WiperCam pan-and-tilt camera with an in-the-pipe cleaning system and field-replaceable wipers. The camera has a 300-degree viewing angle and LED lighting system to capture pipe details and ensure accurate assessments. The lightweight reel has 1,000 feet of low-friction, multiconductor cable, making the system fully portable. **800-234-7205; www.ariesindustries.com.**

— plus camera lift, carriage and illumination accessories — mean it transforms in seconds to inspect any size line. The crawler is six-wheel drive with proportional steering to navigate past obstacles and has overlapping wheels to climb offsets. Powerful motors and a geared six-wheel drivetrain maximize travel range. It is built on an expandable digital backbone, with the ability to add side scanning and laser profiling, view data from onboard sensors, automate tasks with macros and measure defects on screen. Its firmware updates automatically to the latest features. **866-936-8476; www.envirosight.com.**

Envirosight ROVER X



The **ROVER X** inspection crawler from **Envirosight** lets an operator control inspections, view and record digital video, log observations, generate reports and link directly to asset management software. All these capabilities are packed into a simple, three-piece layout, with no CCU or other components to clutter the workspace. Twelve-wheel options

— plus camera lift, carriage and illumination accessories — mean it transforms in seconds to inspect any size line. The crawler is six-wheel drive with proportional steering to navigate past obstacles and has overlapping wheels to climb offsets. Powerful motors and a geared six-wheel drivetrain maximize travel range. It is built on an expandable digital backbone, with the ability to add side scanning and laser profiling, view data from onboard sensors, automate tasks with macros and measure defects on screen. Its firmware updates automatically to the latest features. **866-936-8476; www.envirosight.com.**

Insight Vision Cameras IRIS



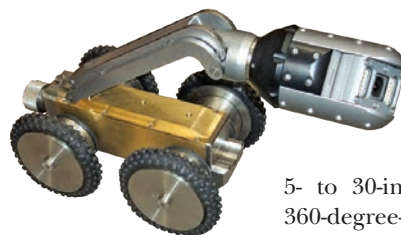
The **Insight Vision Cameras IRIS** crawler system is compact and portable, and it comes complete with a motorized crawler and a motorized power-rewind/feed-assist cable drum. The reel has 600 feet of Kevlar coax cable. The corrosion-resistant brass-body crawler will stand up to harsh conditions. The camera has a 180-degree pan and 360-degrees of tilt, allowing the user to inspect pipes from 6 to 12 inches, and up to 18 inches with an optional pneumatic wheel set. The module has USB, HDMI and SD external ports. The reel has a 10-inch, daylight-readable touch screen. Its easy-to-use software runs on Windows 10. **800-488-8177; www.insightvisioncameras.com.**

RapidView IBAK North America PANORAMO



The **PANORAMO** method from **RapidView IBAK North America** changes current processes into data collection in the field and data analysis back in the office. At the core of the system are the wide-angle (185-degree) twin digital cameras, found on both the front and the rear of the system. As it moves through the pipeline, the two cameras simultaneously capture still images in 4K resolution. To achieve such high resolution and allow it to be displayed and stored, a Gigabit Ethernet standard is being used for the transmission of images and other data. This allows a data transmission rate of up to a gigabit per second. **800-656-4225; www.rapidview.com.**

Ratech Electronics Mini Crawler PNT



The **Ratech Electronics Mini Crawler PNT** is a self-propelled four-wheel-drive multiconductor camera transporter. The 12 super-bright LEDs with variable intensity light the way through 5- to 30-inch-diameter pipes. Using the full 360-degree-rotation pan-and-tilt camera, users will be able to see defects and obstructions more closely and in more detail. This same camera head is interchangeable with

the head on the company's push camera system. The power and controls to operate the crawler are in a handy remote control device. It comes with a manual lift and built-in 512 Hz sonde for locating purposes. **800-461-9200; www.ratech-electronics.com.**

INSPECTION VEHICLE



Subsite Electronics inspection vehicles

CCTV pipeline inspection systems from **Subsite Electronics** include ergonomic layouts and hand-crafted cabinetry that actually fits the equipment. Choose a turnkey, ready-to-survey system or specify your own productivity machine. Various layout plans are available for high cubes, sprinter vans, cargo vans, step vans, transit vans, trailers and all-terrain vehicles. **800-767-1974; www.subsite.com.**

LASER PROFILING EQUIPMENT

RauschUSA KSI35 Scan



The **KSI35 Scan** from **RauschUSA** has two laser diodes integrated into a main-line TV camera head that projects lasers onto the pipe wall. It is designed to perform three tasks in one complete system: CCTV inspection, crack measurement and laser profiling. It is a full camera connected to the L135 steerable tractor. No lengthy, manual field calibration is necessary — simply place the profiler in the pipe and begin instantly. As it travels

through the pipeline, it performs conventional CCTV inspection while taking accurate joint and crack measurements using the integrated laser diodes. On the return trip to the manhole, the rotating camera head analyzes the pipe profile via spinning laser technology. All data is instantly and accurately generated on site using the POSM software. There is no third-party analysis involved, thus providing immediate and reliable evaluation of the pipe right on site. It can be used in 6- to 48-inch pipes. **717-709-1005; www.rauschusa.com.**

LOCATORS

General Pipe Cleaners Gen-Eye Hot Spot



The **Gen-Eye Hot Spot** pipe locator and transmitter from **General Pipe Cleaners/General Wire Spring** includes a total field antenna and on-screen icons to help lead users to their targets without a long learning curve. It can be used to quickly and accurately locate inspection cameras, sondes, active power lines and utility lines. Rated at IP65, it is water resistant and dust-and dirt-proof. The 5-watt transmitter, in tandem with the locator, makes finding buried utilities quick and easy. More power means more signal to locate.

Choose one of four frequencies to best suit the application. **800-245-6200; www.drainbrain.com.**

MyTana Locate and Leak Detection Package



MyTana's Locate and Leak Detection Package helps save time finding leaks in utility lines. The LD40 leak detector works like a stethoscope to detect hissing, trickle or seeping sounds while filtering out background noises. It can detect through any surface and has an easy-to-understand, real-time visual response meter, enabling operators to listen and watch for

leaks. Five frequency bands help users home in on hard-to-find leaks, so the LD40 is suitable for use on vertical line leaks, slab leaks and irrigation leaks. The package includes the RL8873 locator and RT8872 transmitter, which can locate most buried utility lines. **800-328-8170; www.mytana.com.**

Radiodetection RD8100



The **RD8100** cable locator from **Radiodetection** is engineered to deliver high precision for damage prevention when locating buried cables and pipes. This advanced range of underground utility locators offers optional integrated GPS and usage logging. Containing an arrangement of five custom-manufactured, precision ground antennas, it allows the user to choose the best method to locate specific pipes and cables. Integrated GPS and usage-logging options automatically generate data for customer reports or in-

house quality and safety audits to promote the best working conditions. **877-247-3797; www.radiodetection.com.**

RIDGID SeekTech SR-24 line locator



The **RIDGID SeekTech SR-24** line locator paired with the RIDGIDtrax app simplifies locating jobs and streamlines the creation of accurate maps of underground utilities to protect critical assets. It is a locating receiver that uses integrated Bluetooth communications to transmit data and GPS coordinates to a mobile device. Its omnidirectional antennas capture the complete signal field, making it easy to locate a line and follow its path. Pairing it with the RIDGIDtrax app for iOS or Android allows for creation of visual maps of underground utilities using a phone or tablet. Multiple lines can be traced, color-coded and named on an overhead satellite image of a job site. It weighs 3.5 pounds, has a battery life of eight hours, wireless range of 200 yards and can be programmed to detect any active frequency from 10 Hz to 35 kHz. **800-474-3443; www.ridgid.com.**

Superior Signal Smoke Fluid Systems



Smoke Fluid Systems from **Superior Signal** are used to find faults and sources of surface water inflow in collections systems. Smoke fluid is both high-quality and economically priced.


Blowers are engineered for smoke testing, using a double-insulated heating chamber with stainless steel injector to maxi-

(continued)

mize dry smoke output and produce quality, liquid-based smoke. Blowers can be configured to work with Superior Smoke Candles. 800-945-8378; www.superiorsignal.com.

MAINLINE TV CAMERA SYSTEMS

Aquam Pipe Diagnostics Investigator



Investigator from **Aquam Pipe Diagnostics** is a pressurized pipe inspection and leak detection system designed for 3-inch and larger pipework. It has a tri-sensor head incorporating HD CCTV, a hydrophone for leak detection and a high-powered sonde for mapping and leak verification. Access is gained through 2-inch access points such as hot taps and air release valves. Fire hydrants can also be used as an entry point with a dry barrel fire hydrant adapter. The system is mounted onto pipework through a selection of fittings with operational pressures up to 150 psi. This process makes access into the pipework simple and cost-effective. Monitoring the real-time data captured by the camera and hydrophone sensor head allows the operator to understand internal pipe conditions, document asset inventory and condition, and accurately detect and verify leaks with no disruption to the water distribution system, allowing the pipeline to stay in service. 904-456-7926 www.aquampd.com.



CUES MPlus+ XL

The **CUES MPlus+ XL** push system is designed for easy operation with an all-in-one setup and flexibility by quick removal of the control unit to be used separately. It includes a coiler configuration and pan-and-tilt camera for mainline and larger pipeline applications up to 500 feet. It integrates video observation coding, observation coding interface and digital recording. The lightweight system includes large, durable wheels for portability and a balanced footprint for stability. It is manufactured to handle rigorous field use. 800-327-7791; www.cuesinc.com.



Electric Eel Ecam Pro 2

The **Ecam Pro 2** mainline pipeline inspection camera system from **Electric Eel** has a stainless steel-housed, 1.68-inch, self-leveling color camera with sapphire lens; 20-LED light ring with an impact-resistant polycarbonate light ring cover; and high-resolution CCD element. The auto-iris adjusts light automatically. A flexible camera spring navigates 3-inch P-traps. The unit comes standard with 200 feet of braided fiberglass premium 1/2-inch-diameter pushrod (with a capacity of 400 feet available on the reel), industry-standard 512 Hz sonde, 10.4-inch daylight-readable monitor with click-touch controls, and one-touch recording directly to a USB flash drive. It has an on-screen footage counter, a two-hour battery with built-in charger, adjustable light controls, 16 pages of text writing with memory saves, voiceover recording, an 8x zoom function, audio/video out jacks, 8-inch wheels for easy maneuverability, a secure-locking reel brake, and rugged powder-coated steel tube and bar construction. 800-833-1212; www.electriceel.com.

Forbest Products FB-PIC3188XX/4188XX



The **FB-PIC3188XX/4188XX** portable lay-flat camera system from **Forbest Products** comes with a 1-inch waterproof color camera head or 1-inch self-leveling color camera head with a built-in 512 Hz sonde transmitter, stainless steel spring kit and bright LED lights. It comes with 130 feet of 5.3 mm or 200 feet of 6 mm fiberglass cable, with a high-resolution 7- or 10-inch color control station with USB and SD recording. Typing and editing is optional for the 10-inch multifunction control station. The lay-flat design is convenient for one user to operate the camera independently. 877-369-1199; www.forbestusa.net.



Pearpoint (USA) P540c

The **Pearpoint (USA) P540c** offers an intuitive graphical user interface with built-in user manual, a full-size QWERTY keyboard and a choice of six different languages at launch. Context-sensitive, ATM-style buttons on both sides of the display provide access to the easy-to-use menus while an additional seven buttons offer direct control of the most-used functions. It has the capability to use the newly designed command module with any reel system. This will provide customers the flexibility of having multiple rods for different uses while only needing one command module. 800-688-8094; www.pearpoint.com.

Spartan Tool Explorer



The **Explorer** modular camera system from **Spartan Tool** has a control box that is compatible with five different pushrods up to 400 feet in length, letting the user quickly adapt to any environment. Included WinCan software allows the user to

map full plumbing systems for future reference, and files can be saved to a WinCan account, the cloud, external USB drives and the system's internal storage. The stainless steel camera head provides a crisp, color picture to the super-bright, sunlight-readable LCD. Change out reels to create a system that provides the ability to tackle any size job. 800-435-3866; www.spartantool.com.

Vivax-Metrotech vCam-6



The **vCam-6 HD** inspection system from **Vivax-Metrotech** includes features such as text writer, voice-over, locatable sonde and traceable pushrod as standard equipment. The standard reel is available with 200, 300 or 400 feet of pushrod and choices of 1.3- or 1.8-inch self-leveling HD camera. The system includes a daylight-viewable control module with a 9.7-inch HD LCD monitor, distance counter and internal rechargeable batteries with five-plus hours of battery life. Video recording and JPG-format pictures can be saved to the internal 1 TB hard drive. The control module has built-in Wi-Fi to stream live video and snapshots to smartphone apps

PRODUCT FOCUS

or directly to a computer for recording to the hard drive. 800-446-3392; www.vivax-metrotech.com.

RECORDING/ARCHIVING/DATA DEVICES

Hermann Sewerin GmbH SePem 155



SePem 155 data loggers from Hermann Sewerin GmbH can help reliably identify existing leaks and catch new ones early on. In relation to the size of a measuring area, the volume of water initially escaping from a new leak is usually so low that it cannot be clearly distinguished from minimum nighttime consumption when

measuring the flow. However, the data logger is designed to report the leak after just one night. It is ideal for mobile use and can also be used for the stationary monitoring of water supply networks. Its simple and intuitive menu navigation provides fast and reliable results and can also be reliably operated by less-experienced users. The measuring times and periods of radio activity are freely programmable. 888-592-9916; www.sewerin.com.

Orbis Intelligent Systems Prodigy SmartCap



The Prodigy SmartCap from Orbis Intelligent Systems is a noninvasive pipe-monitoring device that can turn any hydrant into a smart hydrant.

Using sensors and wireless Internet of Things connectivity, it provides real-time infrastructure management by simply swapping the existing pumper nozzle out. Designed to fit on any style of fire hydrant including wet and dry barrels, it permanently monitors distribution pipes (12 inches or less) from the hydrant for leaks, tamper incidents, flow events, temperature and pipe condition (average pipe wall thickness and more). Installation can be completed within minutes without disruption or system shutdown. It monitors, processes and records multiple channels of data from a variety of sensors and uploads it to the cloud via Cat M1 cellular connectivity. Reports and data files are transmitted daily unless events occur, in which case it will transmit real-time data to ensure alerts and notifications are received as they occur. 858-242-1603; www.orbis-sys.com.

SOFTWARE

POSM Software



POSM Software can present data collected from a CCTV inspection in a way that helps everyone, from the sewer manager to the third-party engineer who needs detailed plans for inspection. Engineers can color-code GIS maps for inspection, sending those orders to the inspection truck either through the asset management tool of their choice or using GIS mapping. It was designed from the perspective of the inspector in the truck

while still addressing engineering and management needs. 720-636-0532; www.posmsoftware.com. ♦

OUR TECHNOLOGY IS BASED ON SOUND SCIENCE

Inspect More, Clean Better

Active Acoustics screen for blockage with no flow contact

MILLIONS OF FEET INSPECTED

- Save time, water, AND money
- Screen 2+ miles per day
- EPA validated
- Highly portable and easy to operate



InfoSense, Inc.
Innovating Acoustic Inspection Technology
877-747-3245

sales@infosense.com • www.infosense.com

ADVANCED WATER LEAK DETECTOR



The LD-18 Digital Water Leak Detector uses patented technology to significantly reduce ambient noises from dogs barking, footsteps, people talking, etc. The digital amplifier samples the sounds every few tenths of a second, rejecting intermittent sounds instantly.

See the LD-18 at www.subsurfaceleak.com.

SubSurface Locators™

(408) 249-4673

www.subsurfaceleak.com

CASE STUDY

MAINLINE TV INSPECTION AND LOCATION *By Craig Mandli*

Rapid acoustic inspection leads to focused cleaning efforts



Problem:

With a time-based maintenance program, Little Rock Water Reclamation Authority in Arkansas annually serviced 40% of its small-diameter

collections system using high-cost resources such as CCTV or cleaning. Some of these serviced segments had plenty of flow capacity, while blockages in other parts of the system were being missed and causing overflows. Despite having a highly sophisticated cleaning program, Little Rock looked to enhance its program and reduce sanitary sewer overflows by implementing new technologies.

Solution:

In January 2017, Little Rock started utilizing the **Sewer Line Rapid Assessment Tool**, or SL-RAT, from **InfoSense** to rapidly screen 100% of its small-diameter pipes for blockages on an annual basis at very low cost. The authority focused high-cost resources such as cleaning and CCTV on 20% of the system that was determined to have blockages through acoustic screening.

RESULT:

By deploying resources based on condition, rather than time, Little Rock reduced time spent cleaning clean pipes. By utilizing acoustic technology to screen before cleaning, Little Rock cleaned 32% fewer linear feet but increased cubic debris removed by 116% in 2017. By 2018, they reduced SSOs by approximately two-thirds without hiring any additional personnel. **877-747-3245; www.infosense.com.** ♦



T&T Tools, Inc.

800.521.6893

Probes & Hooks



Hooks...

- * Heat treated for long life
- * Manhole Cover Hooks
- * Septic Tank Lid Hooks
- * Many styles available
- * "T" handles for two hands or compact "D" handles

Probes & Hooks



Probes...

- * Insulated, Standard and Specialty
- * Metal shafts: 3/8 round or hex
- * Replaceable hardened tips
- * Optional "slide" available to make your probe a mini-slide hammer




Call for a FREE Catalog


Email: sales@mightyprobe.com Fax: 800.521.3260

Taking Science To The Sewer®

Providing high quality, reliable sewer cleaning nozzles and sewer cleaning equipment to the water and waste management industry




Clean sewers **better, faster, with fewer passes and less fuel!** that's what science is for! NozzTeq® sewer cleaning nozzles and sewer cutters are the best engineered sewer equipment available; we have been first-to-market with truly innovative equipment that effectively channels the jetting power of today's trucks, and our unique, patented jetter nozzles and cutters solve *real* problems for private and municipal sewer maintenance professionals





Thanks For Visiting Us

CALL TODAY FOR AN ON-SITE DEMO AND TEST YOUR FLOW AT NO COST

NozzTeq®
Taking Science To The Sewer®

www.nozzteq.com
1.866.620.5915



Pressure Washers & Drain Jetting Equipment

Van Mount Cold Water Jetter

VM4007H • 7 gpm @ 4000 psi
 • 400' x 3/8" hose on DC Reel
\$8,995 • 690cc Honda

VM2712H • 12 gpm @ 2700 psi
 • 400' x 1/2" hose on DC Reel
\$9,599 • 690cc Honda

Hot Water Cargo Van Jetter

CV4007H-HOT • 7 gpm @ 4000 psi
 • 400' x 3/8" hose on DC Reel
\$15,299 • 690cc Honda

CV2712H-HOT • 12 gpm @ 2700 psi
 • 400' x 1/2" hose on DC Reel
\$15,995 • 690cc Honda

Trailer Models

STB2712H • 12 gpm @ 2700 psi
 • 400' x 1/2" hose on DC Reel
\$15,099 • 690cc Honda

STB4012K-P00163 • 12 gpm @ 4000 psi
 • 400' x 1/2" hose on DC Reel
\$21,429 • 999cc Kohler

TT4 Series • 18 gpm @ 4000 psi
 • 500' x 1/2" hose/hydraulic reel
\$44,500 • 74 hp turbo intercooled HATZ Diesel



**We Custom Build
 Machines To
 Your Specifications!**

Kohler powered models available, call for pricing 800-648-5011
 Looking for smaller or larger models? See all the jetting equipment at www.camspray.com

800-648-5011 | www.camspray.com | sales@camspray.com



AMERICAN HIGHWAY PRODUCTS LTD.

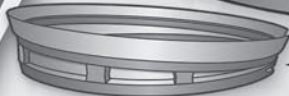
RAISING AMERICA, ONE INCH AT A TIME

the PIVOTED TURNBUCKLE Manhole Riser



The Most Efficient
 and Powerful Expanding
 Riser on the Market.

Riser heights 3/4" and up in all
 diameters. 1" diametric
 variance and DOT approved
 in most states.



NEW! INCLINED RISER. Now you can RAISE & TILT the manhole cover.

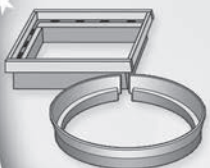
SAFETY RAMPS

ELIMINATE

- Vehicle Damage Claims •
- Material Cost for Cold Patch •
- Labor and Disposal Costs •



**Catch Basin &
 Valve Box Risers**
 reduce costs and
 streamline adjustments



I.D. Locator allows
 for easy location of
 common utilities
 and aids in identify-
 ing striping



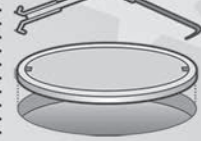
Sewer Lid Seal Kit
 eliminates
 lid vibration and
 reduces moisture
 penetration



**Rubber Adjusting
 Ring** protects
 sub-structure,
 eliminates noise
 and vibration



EZ Lift will unseat,
 lift, and set down a
 manhole cover in
 one smooth
 motion



Toll Free 1-888-272-2397 • www.ahp1.com • e-mail: sales@ahp1.com • Free DVD/CD ROM

Product Spotlight

Manhole chimney seal guards against inflow and infiltration

By Craig Mandli



There's a simple reason to take steps to prevent inflow and infiltration into sewers: It's an expensive problem that has affordable solutions. Manholes are often the most common source of infiltration, as when the grade adjustment (chimney) area begins to deteriorate, they can virtually serve as a sieve, allowing inflow to flow freely into sewer systems during wet-weather events. It simply doesn't have to be that way, though.

The Infi-Shield Uni-band from Sealing Systems is an inexpensive and permanent method of externally sealing the grade-adjustment ring area of a manhole. The one-piece molded seal has a reinforced, pre-formed L-shaped corner. Accommodating ground movement, the Uni-band's high-quality rubber and nonhardening butyl mastic provide a flexible, watertight seal around the structure. The method saves taxpayers money by not having to treat the extra clearwater and by avoiding expensive repair and maintenance costs.

"It is made of EPDM rubber and is fully assembled so there are no modifications needed in the field and no special tools needed," says Pam Sawatzke, sales/marketing director for Sealing Systems. "The pre-formed L-shape at the top of the seal assists in the ease of installation and provides a watertight seal onto the casting frame."

The Uni-band seals the casting frame to the cone section of a manhole/catch basin so no infiltration can get in between the adjustment rings. Multiple sizes are available to fit most cone sections and manhole castings, and they can be used on regular manhole cones or top slab installations.

"There were years of research and development that went into designing the improved angled seal," Sawatzke says. "With all variations of manhole designs throughout the world, there was a need for extensive research on different size casting frames, adjustment ring sizes and cone section styles. After testing was complete, the final sizes were put into production to accommodate almost any structure out there."

The Uni-band has an inspection tab attached at the top of the seal, and an aerosol primer is also included. A clean surface is necessary, but no special tools are required for installation. The Uni-band can be immediately backfilled, saving work crews valuable time on the job.

"Customers like it because of the price and ease of installation," Sawatzke says. "When we ask the right questions, we can get them the perfect watertight seal for the chimney sections." **800-478-2054; www.ssisealingsystems.com.**



Patterson Mfg. davit cranes

New davit cranes are available from corrosive environment and safety expert, Patterson Mfg. Give your operations a lift with models in 1/2- and 1-ton capacities. The cranes exhibit the company's hallmark safety, simplicity and durability, with key features such as a reliable brake with long life and readily available parts, a hot-dipped galvanized finish, and no plastic sheaves or pulleys. They put safety and simplicity within your reach with a low-maintenance, easy-to-assemble design that is made in the U.S. For over 160 years, Patterson has been a trusted supplier of winches, rigging, fittings and custom products for lifting applications in the marine, construction and mining markets. These davit cranes continue to deliver the company's promise of helping businesses run safer, easier and faster. Find out how our team and products can improve employee safety and positively impact your bottom line.

800-322-2018; www.pattersonmfg.com/davit-cranes

1. General Pipe Cleaners JM-1000 Mini-Jet

General Pipe Cleaners/General Wire Spring's portable JM-1000 Mini-Jet has a new, high-performance stainless steel braid jet hose that offers drain cleaning power and performance in a small package. The JM-1000 Mini-Jet is available with stainless steel braid/Teflon core hoses in a variety of lengths. It has 1,500 psi of cleaning power in a compact package, yet weighs only 23 pounds. The stainless steel braid hose design slides the jet nozzle down 1.5- to 3-inch drainlines and more easily navigates tight bends. The 3/16-inch Teflon core also reduces flow resistance, further improving small-line cleaning power. The standard package has a four-piece nozzle set, water supply hose, shut-off valve and universal faucet adapter. Safety features include a three-wire GFCI. **800-245-6200; www.drainbrain.com.**



1.

2. Avanti International hydrophobic grouts

Avanti International's hydrophobic grouts are available in new, easy-to-use dual cartridges: AV-248-LV Flexseal LV with AV-249-LV Flexseal Cat LV, AV-275 Soilgrout with AV-276 Soilcat and AV-290 Fast-Set. These products are used to permanently stop leaks, stabilize soils and control groundwater. The catalyzed AV-248-LV and the AV-275 Soilgrout are a moisture-activated, MDI-based polyurethane resins. The AV-248-LV resin is designed to seal active and potential water leaks in various cracks and annular spaces where flexibility is needed but is susceptible to wet/dry cycles. The AV-275 is designed to bind together and waterproof loose granular soils. And the AV-290 is a midrange viscosity, dual-component, hydrophobic MDI-based polyurethane resin designed to fill large voids on the exterior of below-grade structures where high water flow is present. **800-877-2570; www.avantigrout.com.**



2.

3. KH Industries HazRay hazardous location lighting

KH Industries' LED HazRay hazardous location lights are available in single hand-held, stringer and multihead light versions. Designed with versatility and safety in mind, they are Class I, Div. 1 and 2 lights that hold CSA certification for U.S. and Canada. The NEMA 4X rating allows for integration in a wide range of outdoor and harsh-condition work site applications. Already being utilized in aerospace maintenance, repair and overhaul; shipbuilding; and utility markets, these lights will also perform in agricultural environments, for paint booths, at oil and gas refineries, and many other industries. The bright lights provide users with a durable, lightweight body, staving off fatigue in employees at the job site. **716-312-0088; www.khindustries.com.**



3.

4. Bonomi North America S250 series stainless steel in-line check valves

Bonomi North America's S250 series stainless steel in-line check valves are NSF 61/372 certified for potable water and lead-free applications. All six sizes of the NPT threaded S250 series, from 1/2- to 2-inch, have been certified lead-free by the methods prescribed in NSF/ANSI 372. The metal-forming process for the valves allows an improved flow profile inside the valve body to minimize headloss. It also eliminates machining for reduced manufacturing cost. The S250 series is electron-beam welded at the end cap-to-body connection, creating a unibody for leak-free service. The valves are rated to 250 WOG (water, oil, gas) with an operating temperature range of 4 degrees below zero to 302 degrees F. **704-412-9031; www.bonominorthamerica.com.** ♦



4.

Applied Felts acquires FerraTex Services

Applied Felts entered into binding agreements to acquire the business and assets of New Jersey-based FerraTex Services. The acquisition includes the complete transfer of all property, equipment, intellectual property and expertise.

According to a release from Applied Felts, Alex Johnson, president, says, "FerraTex Services has built a very successful preimpregnated CIPP liner business by leveraging its extensive experience in CIPP logistics and installation. Our close collaboration since 2016 has enabled us to witness first-hand FerraTex's expertise and commitment to operational excellence. While 'business as usual' will be our operational guiding principle for FerraTex going forward, we are excited about what the future holds for this partnership, particularly our ability to enhance the offering to customers through the group's manufacturing, R&D and global experience as the CIPP industry continues to expand."

HOBAS Pipe USA participates in the Demand Response program

In addition to the certifications in accordance with ISO 9001 and 14001, HOBAS Pipe USA worked with its local energy company to participate in its Demand Response program. Demand Response is a solution that enhances energy reliability and helps electrical customers reduce their electricity usage during times of peak usage or community emergency, reducing

electricity demand. HOBAS' manufacturing plant is able to transition from grid power to generator when it is notified by the grid operator or utility company that the grid is stressed and approaching a high level, weather events signal potential power outages, or an emergency or catastrophic event requires curtailment.

Signature Equipment joins Vac-Con distributor network

Vac-Con announced that Signature Equipment in Salt Lake City has joined its distribution network. Signature Equipment has been in operation since 1994 when founder Reed Prows opened its doors to serve the Utah market. In 2017, the company relocated to a larger facility to accommodate the growing demand on its workforce. The Vac-Con product line will be the first vacuum truck portfolio that Signature Equipment has carried. Its other product offerings include refuse collectors, utility bodies, snowplows, salt spreaders and more.

Wilco USA acquires pump manufacturer American-Marsh Pumps

Wilco USA, through its newly established subsidiary, American-Marsh Pumps, acquired the assets of U.S. manufacturer J-Line Pump Co., doing business as American-Marsh Pumps. Headquartered in Collierville, Tennessee, American-Marsh Pumps currently employs 55 people.

Brandstetter joins Grundfos Pumps as new chief technology officer

Markus Brandstetter joined Grundfos Pumps as its new chief technology officer. An experienced technology leader and champion of digitalization, he brings significant experience from senior roles in large industrial companies. He will lead operational strategy development with a special focus on Internet of Things and service-oriented business strategy. In addition to serving as the CEO at Bosch Industrial Boilers, he has held various other leadership positions within international groups like Siemens, Alcatel and Bosch.

Municipal sewer grout school dates announced

In conjunction with CUES, Avanti and Logiball the municipal grout school will be held March 25 and 26 in Orlando, Florida. The level 200 program will provide hands-on demonstrations for leak sealing and present technical information on several topics including lateral and main-line test-and-seal packer operation and performance, mixing and optimizing AV-100 acrylamide grout performance, review and demonstration of new NASSCO/ICGC grout specifications, live infiltration and grout-sealing demos, and new grout testing and monitoring information and methods. Attendees will receive credit for 10 professional development hours certified by the Center for Innovative Grouting Materials and Technology. To register, contact Jessica Williams at Avanti, 281-956-3111 or email jessica.williams@avantigrout.com. ♦



CERTIFIED
McELROY
RENTAL

MAKE SURE YOUR RENTAL MACHINE IS READY FOR THE JOB AHEAD.

Learn more and find a rental location near you.
www.CertifiedMcElroy.com

UNLEASH THE POWER of the **enz** BULLDOG!

Application range:
2.5" - 24"

400.037 400.060 400.080 400.101

This all-purpose nozzle is the most efficient and economical way to clear roots, debris and blockages from your pipes.

- Utilizes both fresh and recycled water
- Easy to handle and low maintenance
- Reduces transportation and water costs
- Oil-free braking system provides low wear and tear operation

 THANKS FOR VISITING US

enz  **usa inc.**

1585 Beverly Ct., Unit 115 | Aurora, IL 60502

 CALL 1 877 ENZUSA1 For a dealer near you www.enz.com


CAP Composite Covers and Frames

- ✓ 100% Watertight in 20 inches of water– 0.00 GPM
- ✓ H-25 Traffic Rated – Load Rated above 100,000 lbs
- ✓ DOT Approved – “Within Roadway”
- ✓ Resists Corrosion, UV and Theft
- ✓ Odor Free
- ✓ Half the Weight of Iron...but not too light.
- ✓ Pigmented & Stone-like Appearances Available
- ✓ RFID encapsulated for Asset Tracking and GIS compatibility – *Patent Pending*
- ✓ Detectable With Standard Metal Detectors
- ✓ Designed, Molded, & Assembled in Texas
- ✓ 100% American Owned – The Only USA Compression-Molded Composite Cover

Remember, if it doesn't say "Made In USA," It is Chinese

Don't Settle for Those Chinese Knock-Offs... Just CAP That!®

Composite Access Products (CAP) • 5216 N 26th St, McAllen, TX 78572 • www.justcapthat.com • 844-344-CAP1 (2271)

 Composite Access Products

WEQ

WASTEWATER EQUIPMENT FAIR

Nissan Stadium - Nashville, TN

2 DAYS OF LIVE EQUIPMENT DEMOS!



September 29 & 30, 2020 | www.weqfair.com

BROUGHT TO YOU BY:

Pumper Cleaner

PRO
PORTABLE RESTROOM OPERATOR

**ON-SITE
INSTALLER**

MUNICIPAL
**SEWER
WATER**

tpo

I&I

Plumber

digDIFFERENT



VIVAX
METROTECH

Locate and Inspect with Speed, Accuracy and Confidence



Full HD
1080p

vCam-6 HD Inspection System

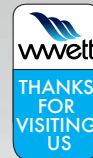
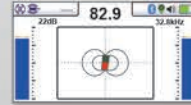
- 9.7" Anti-glare HD Display
- 1TB Hard drive
- 1080 HD Cameras
- 512Hz Sonde
- Locatable Pushrod

vCamMX-2 Mini Inspection System

- 512Hz Sonde
- Locatable Pushrod
- High Resolution Cameras
- Direct USB Recording

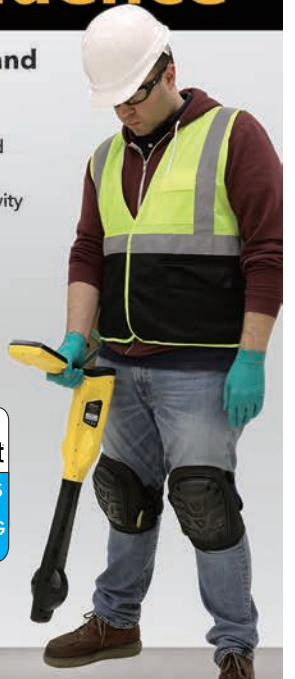
vLoc3-Cam Sonde and Utility Locator

- Directional arrow guidance
- Locates sondes and pushrod
- Graphical user interface
- Optional Bluetooth connectivity
- 4.3" Full-color display



vCam Live View APP

- Add text to the vCam screen
- Add text to recording video or pictures
- Switch between HD and SD video stream
- Edit files in the phones/tablets operating system
- Share via iOS sharing features (email, text message, DropBox, OneDrive)



Call us for your no obligation on-site demonstration!

Vivax-Metrotech Corporation

3251 Olcott Street, Santa Clara, CA 95054, USA

Toll Free: 800-446-3392 Phone: +1-408-734-1400 Email: sales@vxmt.com www.vivax-metrotech.com

SMP VALVE-OUT TOOL

FLANGE SPREADING & VALVE/METER REPLACEMENT



Spread outside flanges & remove old valve



Prepare gasket surfaces



Reinstall new valve

VALVE-OUT TOOL WORKS ON FLANGES WITH BOLT HOLES FROM 3/4" TO 1-3/8" (STUD SIZES 5/8" TO 1-1/4")

CAN BE USED ON ANY VALVE WIDTH

REQUIRES NO GAP AND CAN BE USED TO SPREAD FLANGES AND REPLACE GASKETS

SAFER, FASTER, EASIER

SPECIALTY MAINTENANCE PRODUCTS, INC.
5711 CLAREWOOD DRIVE, SUITE B.
HOUSTON, TX 77081

EMAIL: SALES@SMPTOOLS.COM

PHONE: 713-667-4402

WATCH THE VIDEO HERE



WEBSITE: [HTTPS://SMPTOOLS.COM](https://SMPTOOLS.COM)

PEOPLE/AWARDS

The U.S. Environmental Protection Agency presented the **Indianapolis Airport Authority** with a PISCES award to honor its stormwater and de-icing capacity project, which improves stormwater infrastructure and enhances water quality at the airport. PISCES stands for Performance and Innovation in the State Revolving Fund Creating Environmental Success.

The **Gallery Garden on Main Street** in Marshalltown (Iowa) received a Best Development Award by the 1000 Friends of Iowa organization. The downtown attraction serves as a model for stormwater management, as well as a location for local artwork.

The **Western Piedmont Council of Governments** (North Carolina) received an Aliceann Wohlbruck Impact Award from the National Association of Development Organizations. The Western Piedmont Council of Governments created a regional code compliance program to serve its 24 local municipalities. The program incorporates municipal code enforcement, Americans with Disabilities Act compliance for local governments under Title II, and a Stormwater and Illicit Discharge Detection and Elimination process under the EPA and North Carolina Department of Environment Quality.

The **city of Malibu** (California) received a Beacon Spotlight Gold Level Award: Sustainability Best Practices from the Institute for Local Government for outstanding achievements to address climate change, promote energy innovation and create more sustainable communities. Among its achievements, the city implemented stormwater capture systems throughout the city.

The American Council of Engineering Companies of Texas awarded civil engineering firm **Lockwood, Andrews & Newnam** a gold medal for its work on the first phase of the Clear Lake flood control project in Harris County. The project, named Exploration Green, is transforming a former golf course into five massive detention ponds that can each hold 100 million gallons of stormwater. Exploration Green also will serve as a nature park.

The Army Corps of Engineers awarded the **city of Huntington** (West Virginia) with the Most Improved Levee System award for the Guyandotte portion of its floodwall and levee system. ♦



PROWLER EASEMENT MACHINES

The Prowler Easement Machine is available in extendable track, track, wheeled or track over wheel configurations. Reel available in capacities To 1,000 feet. Many options available. For more information contact:

3T Equipment Company Inc. **800-969-3001**

tttequip@yahoo.com, Web Site at www.3TEquipco.com

CALENDAR

March 23-26

American Water Resources Association Geospatial Water Technology Conference, DoubleTree by Hilton, Austin, Texas. Visit www.awra.org.

March 29-April 1

American Water Works Association Sustainable Water Management Conference, Hyatt Regency, Minneapolis. Visit www.awwa.org.

April 14-17

Center for Watershed Protection National Watershed and Stormwater Conference, Renaissance Austin Hotel, Austin, Texas. Visit www.cwp.org.

April 19-22

American Public Works Association North American Snow Conference, Cleveland. Visit www.apwa.net.

May 17-21

World Environmental & Water Resources Congress, presented by the Environmental & Water Resources Institute of the American Society of Civil Engineers, Green Valley Ranch Resort, Spa and Casino hotel, Henderson, Nevada. Visit www.ewricongress.org.

May 20-21

American Society of Civil Engineers Watershed Management Conference, Green Valley Ranch Resort, Spa and Casino Hotel, Henderson, Nevada. Visit www.asce.org.

June 14-17

American Water Works Association Annual Conference & Exposition (ACE), Orange County Convention Center, Orlando, Florida. Visit www.awwa.org.

July 12-15

American Society of Agricultural and Biological Engineers Annual International Meeting, CHI Health Center, Omaha, Nebraska. Visit www.asabe.org.

Aug. 9-12

American Society of Civil Engineers Pipelines Conference, San Antonio Marriott Rivercenter, San Antonio. Visit www.asce.org.

Aug. 10-13

National Association of Flood and Stormwater Management Agencies Annual Meeting, Stein Eriksen Lodge Deer Valley, Park City, Utah. Visit www.nafsm.org.

Aug. 17-19

StormCon, Washington State Convention Center, Seattle. Visit www.stormcon.com.

Aug. 30-Sept. 2

American Public Works Association Public Works Expo (PWX 2020), Ernest N. Morial Convention Center, New Orleans. Visit www.apwa.net.

Sept. 14-16

National Rural Water Association WaterPro Conference, Phoenix (site TBA). Visit www.nrwa.org.

Oct. 28-31

American Society of Civil Engineers Annual Convention, Disneyland Hotel, Anaheim, California. Visit www.asce.org.

Nov. 9-12

American Water Resources Association Annual Conference, Embassy Suites by Hilton Orlando Lake Buena Vista South, Kissimmee, Florida. Visit www.awra.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.

Wastewater Solutions from RELINER®/Duran Inc.

Inside Drop Bowl Stainless Pipe Supports

Type 304 & 316 Stainless Steel



- Eliminate outside drops
- Reduce maintenance
- Simplify cleaning
- Stop corrosion
- Install quickly
- Outlets from 4" - 24"
- Optional force line hood



Manhole Invert Channels

RELINER® Drop Bowl
Fits any Structure

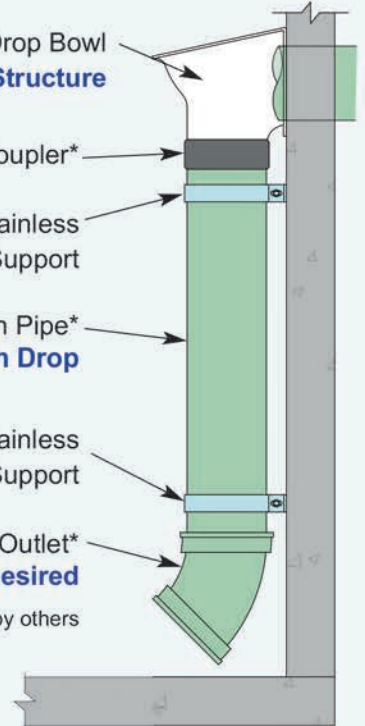
Flexible Pipe Coupler*
RELINER® Stainless
Steel Pipe Support

Down Pipe*
Any Length Drop

RELINER® Stainless
Steel Pipe Support

Bend at Outlet*
Orient as desired

*Supplied by others



U.S. Patents #5553973, 6074130

www.reliner.com

Proudly made in the USA

1-800-508-6001

Extra! Extra! Want More Stories?

Get extra news,
extra information,
extra features with

Online Exclusives

Exclusive online content for
Municipal Sewer & Water

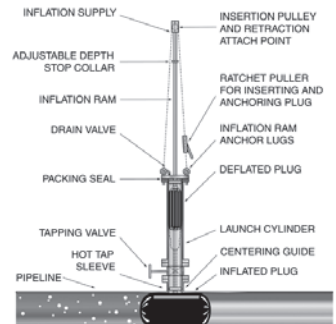
www.mswmag.com/online_exclusives

Petersen® Pipe Plugging Systems



Pipe Plugs and Packers for all your Pressure, Chemical, and Temperature Requirements. Call us to quickly customize a pipe plug or plugging system for your specific application.

Economical Hot Tap Plugging Systems



wwett Thanks For Visiting Us

www.pipeplug.com

Petersen PRODUCTS COMPANY
Serving Professionals Since 1916

PHONE 800.926.1926 OR 262.692.2416
FAX 262.692.2418

JET VACS

2001 Vac-Con VPD42HA/1300 sewer-cleaning unit mounted on a Sterling LT9501 with 131395 miles. 380hp Cat C12 in-frame rebuilt at 101,115 miles. Fuller 10-speed manual transmission, 120gpm FMC Quintuplex water pump, recent reman 165hp Cummins 8.3 auxiliary engine, recent reman Roots/Dresser 827 blower, cold-weather recirculation, 16-cubic-yard debris tank, 1,300-gallon water tank, 30' x 8" aluminum telescoping boom tube (great for catch basins), 500' x 1-1/4" hose on articulating reel. \$40,000. Call Mark 708-475-7116 (CBM)

2007 Volvo with a Vactor 2115 combo unit. (Stock# 5903C). **(888) VAC-UNIT (822-8648); www.vsurentalsllc.com** (CBM)

2011 Vac-Con V390LHA combination cleaning truck. Low miles, great condition. 1998 Vactor 2110-36PD ex-city owned, low miles. See details of these units and CCTV inspection trucks at www.empireequip.com. Contact Craig at 714-639-8352. (CBM)

POSITIONS AVAILABLE

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)

SERVICE/REPAIR

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

TV INSPECTION

CAMERA OPERATORS, STOP SPINNING YOUR WHEELS IN GREASY PIPE! Aftermarket gritted polymer wheels, steel carbide wheels, gritted and treaded tracks, tow cables, kiel sticks and more. Fitting Aries, CUES, Envirosight, Ibak, Rausch, RST, Schwalm & IDTec. **ORDER TODAY** at www.TruGritTraction.com; info@trugrittraction.com; 407-900-1091 (MBM)



Complete sectional lining equipment package including, 1995 Aries grout van converted to camera/cutter van, Cobra touch program, Cobra crawler, extra Cobra pan/tilt zoom camera, Bowman dominator robotic cutter, on board van air compressor. 1984 Sewer Equipment of America jet truck, 60 GPM @ 2,000 PSI, with many nozzles, root cutter, wart hog, 8" diamond tap cutter core saw. 20 ft enclosed wet out trailer with 4 sleeve installers, roll fiberglass lining material, silicate resin all material needed for placing sectional liners. 3" trash pump, with 500 feet hoses, plugs alarm, everything needed to bypass 8" thru 12" lines, tripod, harness, air quality monitor, 2 air blowers, 2 winch machines for pulling liners. Complete package for cleaning, filming, place liners 8" and 10" dia x up to 10 ft length. Extra repair parts. Asking \$165,000 OBO. Contact Steve Tothe for more details.

970-903-9104, CO

M03

NEED TRACTION? We make aftermarket gritted/gripping pads for all chain-driven camera transporters. Custom fabrication secured to a high-quality, nickel-plated carbon-steel chain that doesn't stretch. Also have non-gritted pads, wheels, and tires for all different brands. Pad samples upon request. **Pipe Tool Specialties LLC:** Phone 888-390-6794; Fax 888-390-6670; Visit us online at pipetoolspecialties.com or email pts4422llc@gmail.com (MBM)

USED Envirosight ROVER Sewer Inspection Crawler: Overhauled with new parts and ready to run. Includes automatic cable reel, pan/tilt/zoom camera, steerable 6-wheel-drive tractor with various wheel sets, controls, and accessories. Call for pricing 973-252-6700. (MBM)

Used SeeSnake Camera Systems in all sizes; Used General Wire Spring Camera Systems in all sizes; Used machines in all sizes. We want your trade! The Cable Center: 800-257-7209. (CBM)

WATERBLASTING

1998 NLB 10150-1, 10,000 psi, 1,100 hours on rebuilt 8.3 liter Cummins. Good condition, ready to work. Price: \$19,000. 1999 NLB 20203D, 20,000 psi 6,500 total hours on 8.3 liter Cummins. Good condition, ready to work. Price: \$24,000. Related hoses, guns and accessories available. Contact: Larry Toppert 309-781-5860 or Larry@Toppert.com at Toppert Sales. (C03)

Featured In An Article?

We provide reprint options



POSTERS
Starting At
\$35

Sizes:
24" x 30" &
36" x 45"

LASER
REPRINTS
Starting At
\$10

ELECTRONIC
REPRINTS
Starting At
\$25



Order through our website www.mswmag.com

Planning with Vision

By Peter Kertter | Cover Story | May 2013

Order Reprints

Magazine Manufacturers Classifieds Forums Videos Blog

Rehab/Relining Manholes Inspection Flow Control Location/Det

Subscribe Now! or sign up for our newsletter

Order through our website www.mswmag.com

County of Kauai Department of Water, charged with the task of supplying... to unify and modernize to water... aging water infrastructure, until... supply of quality water for the future on... financial...



Green Bison heavy duty degreaser
 Superb product for grease control in collection systems. Emulsifies grease, improves high pressure cleaning performance. Highly recommended for cleaning/degreasing of tools, equipment and machinery. With Green Bison you do not have to trade efficiency for safety. Green Bison is a certified environmentally responsible product that utilizes natural and bio based ingredients, delivers industrial strength cleaning power while keeping your cost down.

Call us today **866-366-0587**

safe-tee[™]
 chemical
 safetechemical.com

GREEN SEAL CERTIFIED
 This product meets the Green Seal™ standard for cleaning/degreasing agents based on its reduced hazard to humans, reduced aquatic impacts, reduced smog production, and low ozone depletion potential.

Superior[®]

SMOKE
 For SEWER TESTING

Superior Smoke Fluid Systems
 Smoke Candles • Smoke Blowers

MADE IN USA



Superior Smoke Testing
 The Most Cost Effective Method to Find Sources of Surface Inflow

SuperiorSignal.com/MSW

EPL SOLUTIONS[™]
 Thinking Ahead

GVISION CAMERA SYSTEM



Extremely Durable
 Compact
 Self-Leveling
 512Hz
 200'-400' Pushrod
 Daylight - Viewable

714.453.9760
 www.EPLS-USA.COM



mswmag.com

- > Classifieds
- > Used Equipment
- > E-zines
- > Product Categories

STOP SPINNING YOUR WHEELS!

TRUGRIT[™]
 entrugritraction.com

MAKER OF THE WORLD'S FIRST FLEXIBLE CARBIDE GRIT CAMERA CRAWLER WHEEL

Gain traction without damaging the pipe. Safe in PVC, Liner, Clay & all other pipe types. Won't get dull, grit embedded throughout.

SOLID STEEL CARBIDE GRIT WHEELS GRITTED & TREADED TRACKS TRANSPORTER TOW CABLES
 FITS MOST MAJOR BRANDS

Resurfacing Worn Steel Carbide Grit Wheels
 WE WILL BEAT ANY OEM PRICE. CALL TODAY!

407-900-1091 | **TruGritTraction.com**

Let Us Build Your **JETTER**



Diesel Propane Gas

Hot or Cold

AMERICAN JETTER.COM
 866-944-3569

Introducing the **RMS-800 RECIRCULATING MOLECULAR AIR SCRUBBER**

Resurculating odor control for sludge press rooms, screen rooms, kennels, rendering plants, morgues, evidence rooms, hospitals, cannabis grow operations, and anywhere VOC odors are a problem.

- 2 Stage filtration
- 800 CFM, .56 seconds carbon contact time
- 16-gauge carbon steel
- Comes with 250 pounds of activated carbon
- Forklift tong slots for maneuvering
- 4 Hang points for winching to ceiling
- No external venting needed
- Optional casters
- Customizable for your application

Simple Solutions
 INDUSTRIAL ODOUR CONTROL LLC
 IndustrialOdorControl.com/RMS-800
 973-846-7817 • sales@industrialodorcontrol.com

SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER
 MUNICIPAL SEWER WATER

Socially Accepted

f **t** **YouTube** **in**

facebook.com/MSWmag
 twitter.com/MSWmagazine
 youtube.com/MunicipalSewerWater
 linkedin.com/company/municipal-sewer-&-water-magazine



Cua Claws

A Simple Solution for Slippery PVC Pipe - **19 Years of Service**

We resurface all makes of steel transport wheels

CALL JERRY AT **714-697-8697**
www.cuaclaws.com

CONFINED SPACE ENTRY PACKAGE
 ONLY **\$3,195**

The Best Package On The Market Includes:

- 4-Gas Air Monitor (3 Year Sensor Warranty)
- 7' Tripod
- 3-Way Fall Protection
- Work Winch
- Full Body Harness



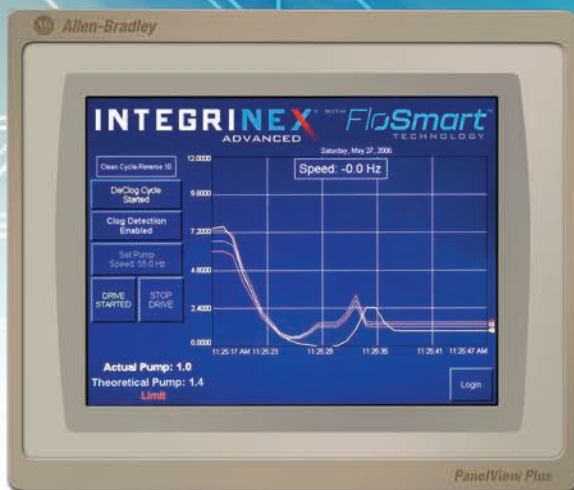
Add a Blower with 15' of duct for only **\$350!**
 Add a 5 Minute Escape Respirator for only **\$500!**

MTECH 800.362.0240
 www.mtechcompany.com

THE BRAINS BEHIND THE OPERATION.

GOR
GORMAN-RUPP
PUMPS

The Pump People®



Integrinex[®] Advanced controls with FloSmart[™] technology are smart enough to detect a pump obstruction...and clear it.

Gorman-Rupp's Integrinex[®] Advanced controls with new FloSmart[™] technology are the brains behind the management of your ReliaSource[®] lift station. FloSmart technology, featuring integrated architecture, is capable of recognizing when a pump is clogging and initiating a cleaning cycle without interfering with the operation of your pump station. For more information, call us at 419.755.1011 or visit GRpumps.com.

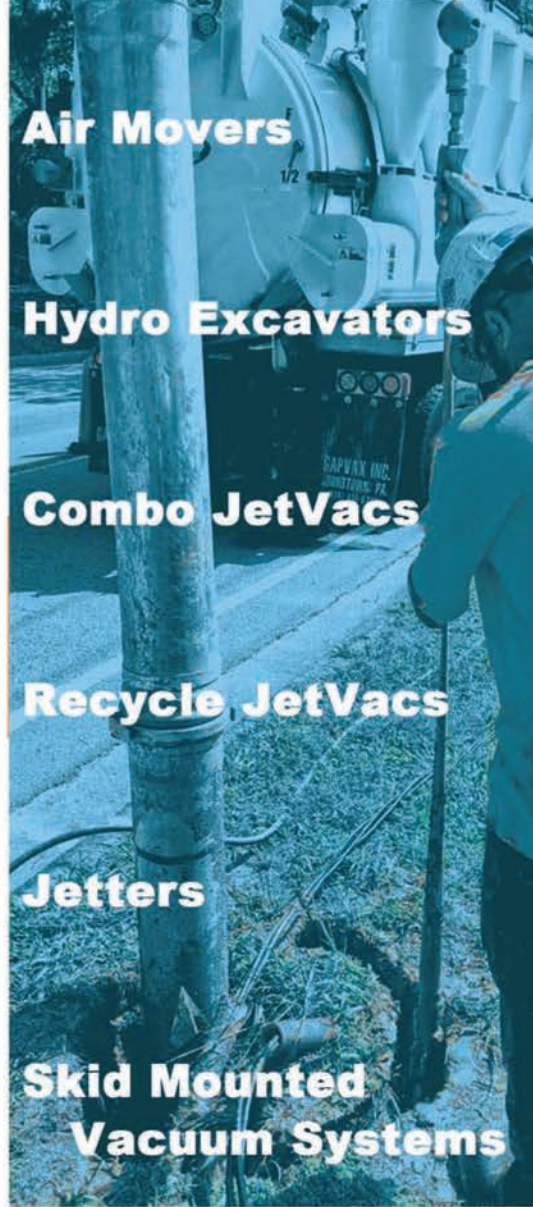


VISIT US AT
**BOOTH
C30007**

INTEGRINEX[®]
ADVANCED
WITH **FloSmart[™]**
TECHNOLOGY



— #BESTTRUCKSINTHEBUSINESS —



Air Movers

Hydro Excavators

Combo JetVacs

Recycle JetVacs

Jettors

Skid Mounted Vacuum Systems



ESTABLISHED IN 1989, GAPVAX CONTINUES TO BUILD THE MOST RELIABLE, VERSATILE, AND RUGGED EQUIPMENT ON THE MARKET.

CUSTOM BUILT INDUSTRIAL AND MUNICIPAL VACUUM EQUIPMENT IS WHAT SETS GAPVAX APART FROM ITS COMPETITION.

IF YOU ARE LOOKING FOR POWER AND PERFORMANCE, QUALITY AND VERSATILITY -

CALL US TODAY TO SCHEDULE A DEMO!

JOHNSTOWN, PA
888-442-7829

DEER PARK, TX
281.884.8658



*Thank You for another great year!
See you next year!*



FULL PARTS & ACCESSORY DEPARTMENT TO MEET YOUR NEEDS

EVERYBODY
BUILDS
ONE



THE DIFFERENCE IS THAT

OURS WORKS.



RECYCLER

BY **VAC-CON**

WWW.VAC-CON.COM

EXPERIENCE THE DIFFERENCE FOR YOURSELF.

SCHEDULE YOUR DEMO TODAY

904.284.4200

WWW.VAC-CON.COM