Rural water issues and rural water people are much the same no matter where you find them. Although Ethiopia may be half a world away, the people in rural communities need and deserve a reliable supply of safe drinking water. While many of the methods that bring drinking water to these small communities will surprise you, the overall process of design, construction, and bureaucracy that make a new water system happen may sound all too familiar.
Water producers need to understand the sources of water quality degradation during the distribution process because, in addition to taste and odor problems that can occur, research also suggests that degraded water quality increases the risk of gastrointestinal illnesses.

The single most important thing about having fire hydrants is that they advertise “Fire Protection!” Communities expect that at a moment’s notice, day or night, in any weather, the hydrant will supply sufficient water to extinguish a fire.
Greetings!

As we begin the National Drinking Water Clearinghouse’s (NDWC) new fiscal year, I’d like to invite you to participate in the On Tap magazine readership survey. This is the first readership survey since we transformed the newsletter into a magazine. The survey is in the center of this magazine.

Though many watchful professionals scrutinize our magazine during the development and production process, we value feedback from our readers. NDWC commits itself to responding to this feedback, which helps make On Tap a premier publication. We will present a summary of the survey results in a later issue of the magazine, but not without first allowing our readers ample time to respond.

We take great pride and pleasure when we hear that our readers and the organizations they represent reprint our articles in their publications. We encourage you to continue this practice, as On Tap is a resource for all of our audiences. We do ask, however, that you let us know when you reprint an article and send us at least two copies of the reprint.

In our new fiscal year, we will continue to address small-system issues, such as security and vulnerability assessments, arsenic, and other emerging issues. As always we will continue to develop and produce resource articles, such as “Tech Briefs” and the new “How-To.” If you want On Tap to address a particular issue, please feel free to let us know.

In the meantime, I look forward to reading your survey comments.
Calendar of EVENTS

Public Water System Compliance Using Point-of-Use and Point-of-Entry Treatment Technologies
NSF International Center for Public Health Education
Orlando, FL
Andrea Lubienski
February 13–14, 2003
(313) 610-1277

13th Annual Berkeley Springs International Water Tasting
Berkeley Springs, WV
Jill Klein Rone
February 20–23, 2003
(304) 258-9147
www.berkeleysprings.com/water

March
American Water Works Association’s (AWWA) Customer Service Conference and Exposition
Denver, CO
March 16–19, 2003
(800) 926-7337
www.awwa.org

3rd World Water Forum
Kyoto International Conference Hall
Kyoto, Japan
March 16–23, 2003
+81-3-5212-1645
www.worldwaterforum.org/

AWWA’s Water Security Congress
Los Angeles, CA
March 23–26, 2003
(800) 926-7337
www.awwa.org

29th Annual Water Quality Association Convention
Las Vegas Convention Center
Las Vegas, NV
March 18–22, 2003
(630) 505 0160
Educational Conference
March 20–21, 2003
Exhibition
www.wqa.org/

June
AWWA’s 2003 Annual Conference and Exposition
Anaheim Convention Center
Anaheim, CA
June 15–19, 2003
(800) 926-7337
www.awwa.org

October
Water Environment Federation’s 76th Annual Technical Exhibition and Conference
Los Angeles, CA
October 11–15, 2003
(800) 444-2933
www.weftec.org

If you are sponsoring a water-related event and want to have it listed in this calendar, please send information to Lori Jennings, National Drinking Water Clearinghouse, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064. You also may call Lori at (800) 624-8301 or (304) 293-4191 extension 5522 or e-mail her at Lori.Jennings@mail.wvu.edu

Do you have great ideas? Contact us!

Do you have a question for our “Ask the Experts” column? For that matter, do you have an idea for an article we ought to publish in this magazine? The On Tap editors are always eager to hear story ideas and topics we should cover in these pages.

E-mail our editors:
Kathy Jesperson
(Kathy.Jesperson@mail.wvu.edu)
or
Mark Kemp-Rye
(Mark.Kemp-Rye@mail.wvu.edu)

Give us a call, toll free, at (800) 624-8301.
We’d love to hear from you!
The 1996 Safe Drinking Water Act (SDWA) Amendments authorized the U.S. Environmental Protection Agency to grant funds to universities to establish and operate small public water system technology assistance centers (TACs). The responsibilities of the TACs include training small public water system operators and the trainers who instruct them. The technical assistance centers also provide technical information related to small public water systems’ performance and operating needs.

These TACs form a network with common goals, including protecting public health, improving water system sustainability, and enhancing compliance. The centers use university resources to help small, rural public water systems or public water systems that serve Indian tribes.

Eight universities around the country house the TACs:
- University of Alaska
- University of Illinois-Champaign
- University of Missouri-Columbia
- Penn State University-Harrisburg S.E.
- Montana State University-Bozeman
- Mississippi State University-Starkville
- Western Kentucky University-Bowling Green
- University of New Hampshire-Durham

Each center approaches helping small public water systems a little differently. Some concentrate on demonstration testing of innovative water treatment technologies that hold promise for small systems, some employ circuit riders to train water system personnel, and others focus on developing training materials for system operators and managers.

All the projects have a regional focus, but their results and products are available to everyone. TACNET’s Web site serves as a central gateway to this information and provides contacts to each center. In addition, the National Drinking Water Clearinghouse distributes many of the training materials developed by the centers.

Visit TACNET’s Web site at water.montana.edu/tacnet. Or contact the NDWC at (800) 624-8301. You also may visit our Web site at ndwc.wvu.edu.
Well Testing in New Jersey to Uncover Contamination

New Jersey property owners with private wells will have to have their water tested before they can sell their homes, state environmental officials say. This test data, which will include coliform, nitrates, iron, pH, lead levels, and volatile organic chemicals, will help disclose groundwater contamination causes throughout the state. Arsenic, mercury, and radium testing will be performed regionally.

The New Jersey Department of Environmental Protection (DEP) will use the test results to create a database of drinking water quality for the state. DEP Commissioner Bradley Campbell says the data will help officials “identify patterns of problems when wells are affected by toxic sites that had not been previously reported,” according to a report from the Associated Press.

Approximately one million people drink from 400,000 private wells in the state. A DEP-certified lab must perform the tests, estimated to cost between $450 and $650. The DEP estimates that 20,000 to 30,000 wells may be tested per year under the new law.

The DEP developed a fact sheet to explain the requirements of the law and accompanying regulations, which took effect September 16, 2002.

For more information, visit the New Jersey DEP Web site at www.state.nj.us/dep.

Is urban sprawl really causing drought?

A recent report released by the Natural Resources Defense Council (NRDC) and other organizations blamed urban sprawl for aggravating water supply shortages and groundwater pollution. But the National Ground Water Association (NGWA) says it’s too soon to blame sprawl for groundwater problems because more research needs to be done.

Vicki Kretsinger, hydrologist and member of NGWA says that for an issue such as urban sprawl, it is important to use data gathered through long-term monitoring programs. “Sprawl may or may not have an impact on recharge, depending on where sprawl is located and the complex hydrogeologic conditions of a given groundwater basin,” she says. “Future water resources management activities must integrate planning and policy with science. In doing so, alternative basin or watershed operations ensure that water resources systems can maintain a balance, and tools such as managed recharge can offset recharge that may be impeded by sprawl.”

Groundwater accounts for two-thirds of the world’s freshwater resources. The percentage of water being extracted for use represents a very small fraction of natural recharge—less than 10 percent in the U.S.
American Museum of Natural History

www.amnh.org

Water is one of life’s most basic, vital components. To demonstrate water’s importance, the Natural History Museum explores water’s voyage on this planet. Students can see water in all its manifestations—from an impossibly small molecule to a raging river—and can trace the journey of this critical resource from primal rainfall to the water that runs from our taps each day.

For more information, write to the museum at Central Park West, 79th St., New York, NY 10024-5192. You also may call (212) 769-5100. For information for school and group visits, call (212) 769-5200.

Museum of the City of New York

www.mcny.org

The Museum of the City of New York’s lower level houses the Fire Gallery, which is devoted to the city’s fire protection programs and water supply system. Children can learn about the important role the water supply system has played in fire control over the years, seeing not only photographs and pictures of firefighting scenes from the 17th century onward, but also being able to inspect actual artifacts from the old system.

A wooden water pipe that the city’s earliest water plant workers made out of a hollow pine log provides an historic piece of the city’s underground water system. The system started in 1800 and consisted of 25 miles of wooden pipes, carrying water from the Collect Pond to more than 2,000 households.

For more information, write to the museum at 1220 Fifth Avenue, New York, NY 10029. You also may call (212) 534-1672, extension 206.

The Groundwater Foundation’s Kids Corner

www.groundwater.org/KidsCorner/kidscorner.htm

The Groundwater Foundation’s Kids Corner teaches children about groundwater, and how they can protect it and conserve it. The site also provides plenty of cool activities, such as puzzles, mazes, and ideas for festivals.

For more information, contact the Groundwater Foundation at P.O. Box 22558, Lincoln, NE 68542-2558. You also may call them at (800) 858-4844. Or, e-mail them at info@groundwater.org.
New York Historical Society

www.nyhistory.org

Kid City, a permanent exhibition located on the lower level of the Historical Society, is an interactive, play area for children and families to explore different aspects of New York City’s past and present. Water highlights include a large photograph of a little boy pumping water from a pump on the sidewalk and a recreation of a New York sidewalk from 1901, including an old fire hydrant.

The Historical Society’s library also provides an array of resources relating to the water supply. One can find anything from the original Act of Incorporation of the Manhattan Company in 1799, to the Catskill Water System News of 1913, to an 1893 sanitary inspection report from one of the sources of the Croton system supply. Simply ask the librarian to direct you to the card file for New York City’s Water Supply System.

For more information, write to the library at 2 West 77 Street at Central Park West, New York, NY 10024. Or call (212) 873-3400.

Massachusetts Drinking Water Education Partnership

madwep.org/education_kids_stuff.htm

The Massachusetts Drinking Water Education Partnership (MADWEP) provides year-round educational programs and information to increase public understanding of drinking water issues. The partnership is dedicated to protecting drinking water supplies and public health through collaborative projects, culminating in Drinking Water Week events each May.

Drinking Water Week is celebrated throughout the U.S. during the first full week of May each year. This observance provides a great opportunity for teachers to focus some of their classroom activities about where drinking water comes from (reservoirs and groundwater), how it reaches their homes (distribution systems), how public water systems ensure the quality of water (source protection, treatment, and testing), and how we can all help to make sure we have enough water for everyone (water conservation).

MADWEP also sponsors dozens of performances of water-themed plays in elementary schools during Drinking Water Week.

For more information, contact Kelly Momberger, co-chair at (508) 849-4023. Or e-mail her at kelly.momberger@state.ma.us. You also may contact Kelley Freda, co-chair at (978) 365-3800. Her e-mail address is kelley.freda@state.ma.us. Neil Clark, education committee chair, also may provide you with additional information. He can be reached at (617) 788-4643. Or e-mail him at neil.clark@mwra.state.ma.us.

ON THE WEB

NEEFT Offers CCR Information

www.waterqualityreports.org/index.html

The U.S. is one of the few nations in the world that consistently enjoys high-quality drinking water from the tap. But no system is perfect and local differences in tap water quality can be significant.


According to the site, each year, water systems across the country must prepare CCRs, sometimes called water quality reports, to explain what substances have been found in drinking water and whether the water is safe to drink. This Web site provides consumers and professionals with supplementary information on CCRs. The primary purpose is to inform and educate civic leaders, health professionals, environmental and consumer groups, journalists, and others to better understand the reports, and to be able to answer questions about a CCR.

The site also offers fact sheets about common drinking water contaminants, and information about drinking water treatment, sources, and regulations.

For more information, call NEETF at (202) 833-2933. You also may write them at 1707 H Street, NW, Suite 900, Washington, DC 20006-3915.
With the known risks of working in a drinking water treatment facility, how important is it for drinking water systems to provide safety training to their employees, and why?

Editor’s note: Frank DeOrio, On Tap editorial advisory board member, relied on the expertise of David Newart, Auburn, New York, safety officer, to answer this question.

Communities Should Stay Up-to-date

With the increased need for safe drinking water, communities are building new water treatment facilities or upgrading older ones. The need for safety training expands with the building. Communities must keep up with safety-training needs and stay up-to-date about new technology and treatment methods that drinking water systems use. Communities should do this not only to keep our customers (taxpayers) safe and healthy, but just as importantly, to keep our employees safe and healthy. Here are a few examples of safety incidents that have happened in our facility.

Auburn usually hires about a half dozen seasonal employees, usually college students, every summer to work at the city’s water treatment facility. Every year, some of the previous year’s seasonal workers return and, as safety officer for the city, I train them before they begin work.

During the summer of 2000, an incident occurred that sent all the seasonal workers to the area hospital’s emergency department. The system needed some diluted chlorine one afternoon and several of the workers decided to dilute a small amount. They worked on this dilution indoors in a small room. Almost immediately, some of the workers had symptoms of dizziness and sore throats.

The system then evacuated the area and called the fire department to investigate the situation. They also called me to the scene. Even though everyone was feeling better after leaving the area, we sent them all to the local emergency department for evaluation.

As safety officer, I took this as a personal failure. I felt that I did not stress how important it is not to take on additional duties until a trained worker showed them how to do the new duties properly and safely. I now use what happened as a training lesson. Several of these seasonal workers still come back every year, but now they listen much better during safety training.

Last year at the same facility, a one-ton chlorine tank began to leak. The leak activated the automatic alarm signaling a chlorine leak. We contained the leak to the chlorine room and called the fire department in to assist. Using the training that the water treatment facility personnel had, along with that of the fire department’s training, we formulated a plan about how to stop the leak.

Before entering the room, we assigned everyone to a very specific duty. The six-person team entered the chlorine room with personal protective equipment and stopped the leak in less than 90 seconds. In just a few more minutes, the chlorine in the area dissipated and was gone. We then declared the area and facility safe, and the situation was over.

Thanks to the safety training that everyone involved had, no one was injured. With continuous safety training, workers can and will avoid injuries. This should be done not just because of Occupational Safety and Health Administration or other outside agency requirements, but because we all want to.

Yearly safety training needs to be constantly updated and documented. For systems to stay on top of the training and skills needed to run a safe operation, it is important to mandate monthly training—even if it is just a couple of hours a month—along with yearly training to keep the information fresh and current.

The gift of being able to live and reach retirement safely and healthy should not be taken away from anyone.

David Newert
Safety Officer
City of Auburn, New York
Safety Is Everyone’s Responsibility

To paraphrase the punch line from a famous TV commercial, “Having personnel properly trained in all aspects of plant safety—priceless!” The Occupational Safety and Health Act (OSHA) of 1970 affects some 80,000,000 employees nationwide. The odd thing is that for some reason, municipalities are exempt from OSHA regulations. Small systems may or may not be exempt based primarily on how their state views drinking water system ownership. Your local agency can tell you what regulations you are required to follow.

Water utilities must make safety a part of management responsibilities. Once management puts an effective program in place, the task of ensuring that employees apply and maintain the program falls squarely on the shoulders of the supervisors. It would behoove all utility supervisors to follow the basic requirements and guidelines of OSHA in their workplaces, even if they are not obligated to do so.

Supervisors’ responsibilities should include training employees about how to use and care for personal protection equipment (PPE) and reviews of all material safety data sheet (MSDS) information, as well as regular reviews of safety issues regarding hand and power tools, proper lifting techniques, and vehicles and heavy equipment.

Although safety should be primarily the supervisor’s responsibility, as we have all been told over and over, “Safety is everyone’s responsibility.” Properly trained personnel who keep an eye out for each other and the plant is the most important key is to eliminate accidents and safety concerns.

Is your scene safe?

A safety program is like...well, it’s like a haircut. Everyone needs one, but we always put off getting it done until the last minute. And even though no two are ever alike, we are always looking at others and thinking, “I want one like that.”

So why is this true about safety programs? Is it lack of operator time? Is it lack of resources? Or is it a lack of value? Most likely, it’s all these and more. Safety should be a matter of common Sense. It just makes good Sense to have an effective safety program.

The first rule in emergency response is: “Is the scene safe?” The same should be true for the drinking water profession. “Is your scene safe?” Small water systems may not have abundant resources. And this may cause management to be hesitant to expend those resources on something that isn’t directly related to putting water in the pipe. But systems should look at a safety program as an investment.

Comparing the costs of implementing a safety program, to the costs related to injury or lost time at work should make the decision easy. When you consider that there are a lot of safety-related resources out there coming from organizations like the American Water Works Association or the National Rural Water Association, implementing a program is relatively easy.

And just like “one haircut doesn’t last forever,” neither does safety. It is an ongoing, continuous process that should be incorporated into the work environment and implemented on a daily basis. And that really makes good Sense!

Rodney L. Coker
Tribal Utility Consultant (retired)
Indian Health Service

Nelson Yarlott
Resident Operator
Bellvue Water Treatment Plant,
Greeley, Colorado

RUS Interest Rates Down; Only Poverty Line Remains Unchanged

The Rural Utilities Service (RUS) has announced its water and wastewater loans for October 1, 2002, through December 31, 2002. RUS interest rates are set at three levels: the poverty line rate, the intermediate rate, and the market rate, each of which have specific qualification criteria. The rates are:

- Poverty Line—unchanged at 4.500 percent
- Intermediate—decreased to 4.625 percent
- Market—decreased to 4.875 percent

RUS loans are administered through state Rural Development offices, which can provide specific information concerning RUS loan requirements and applications procedures.

For the phone number of your state Rural Development office, contact the National Drinking Water Clearinghouse at (800) 624-8301 or (304) 293-4191. The list is also available on the RUS Web site at www.usda.gov/rus/water/states/usamap.htm.
Employees Keep the Water Flowing
How do we keep the employees?

by Jamie Knotts
On Tap Assistant Editor

“Hello Mr. Clark. This is Sam Stone, superintendent of the PSD on the other side of the county. I’m sorry to call you at home. You’re the chief operator at the Acme Water Utility aren’t you?”

“Yes sir, I am. I’ve been working there for four years.”

“Do they treat you well over there? I mean does the water board give you problems with overtime? How about taking your suggestions? Do they do that? Have they refused to grant your vacation requests because they don’t want to pay a fill-in?”

“We’ll, it’s not a bad place to work, all things considering. It’s just the way things work over here. I always have had to fight with the micromanagers on the board.”

“Yes, I know what you mean. You’re probably glad to have a job, but wish they respected you more. Let me ask you this. Have you thought about what it would be like to work under a board that respects your opinions?”

“Every board meeting I go to.”

“Well, would you consider coming to work for us if I said we work with our employees, not against them?”
As a system manager or water-board member, do you know if any of your system’s employees have had such a conversation recently? If they haven’t, then your utility is probably one of the lucky ones that does not face employee turnover. Water treatment workers are increasingly moving from job to job and system to system as they find better pay and better working conditions at nearby facilities. Many workers leave the water business altogether for different jobs and higher pay in other industries, leaving their system without a certified operator.

Couple a worker’s desire for good working conditions with increasing operator certification demands, and pretty soon a water utility could face an employment crunch. Today’s treatment workers must take courses, pass tests, and spend time on-the-job learning treatment methods so they may obtain proper certification as operators. Hiring someone off the street to be an operator just won’t work under today’s federally mandated certification requirements.

An operator is truly a trained professional with an enormous amount of responsibility.

And let’s be honest, a system’s operator is probably the most important member of a utility’s staff. The operator is key to delivering safe water to customers. In many small systems, the operator is the one repairing leaks in the dead of winter or running the system in the middle of the night so the local fire department has the capacity to fight a fire. The operator does the dirty work others don’t want to.

It’s Often a Matter of Respect

Even though many managers and water-board members recognize water treatment operators for the fine job they do, others don’t appreciate the people they have on staff. That lack of appreciation is increasingly the cause for workers leaving their jobs to find employment at another water system or a job unrelated to the water business.

Penny McCoy is a management support technician with the Pennsylvania Rural Water Association. She says there’s a general lack of respect shown to many of the water treatment workers she meets as she criss-crosses Pennsylvania, helping water board and utility managers.

“I’ve seen water board members that look at operators like a bunch of dirty old guys that just come to work,” McCoy says. “They just don’t show them the respect they deserve as highly skilled workers.”

McCoy says that operators’ opinions are often not considered in the decision-making process.

“Operators will tell their water board that ‘we need to change the chemical treatment method to do the job better’ only to hear the board say ‘We can’t do that,’” McCoy says. “But five months later the board pays a consultant who recommends the very same thing; then they listen. The person who they’re trusting on a day-to-day basis to run their system isn’t listened to when it comes to major decisions that affect the system.”

McCoy says that systems in Pennsylvania are already facing a turnover of certified workers.

“The two main reasons for turnover are a lack of respect and a lack of funds to pay the workers adequately,” says McCoy. “And money probably isn’t the biggest reason they [operators] leave.”

In addition to growing dissatisfaction among workers, water utilities will face a growing problem of retirement as the baby boomer generation
nears the end of their careers. “In Pennsylvania, I see less than 10 operators under 30 years old,” says McCoy. “Who is going to run the systems when all of those older operators retire?”

Jean Holloway agrees that utility workers deserve more respect. Holloway served in various administrative capacities for several small towns in Maryland before providing technical assistance and training with the Maryland Rural Water Association. She now helps small communities with their drinking water and wastewater problems as a training manager with the Environmental Finance Center at the University of Maryland.

“Workers need to know that they matter,” Holloway says. “They [workers] have to be treated better. They need to be appreciated and respected and have some say in their system. There’s a certain percentage of workers who do their jobs and love it because they are dedicated. They do it for the community. The more appreciation they receive, the more likely they will stay. When a system has a rate study or is considering a new treatment process, those overseeing the project forget to talk to the superintendent and the operator.” Holloway says some workers just move from job to job or go to private industry because they’ve reached a certain level of certification and can earn more money in another position. “You can’t blame them,” she says. “They have to think about their families if they can earn more elsewhere.”

But Holloway suggests that water systems should try to hold on to good workers if better pay is the only reason a worker is moving on. “It would benefit the system to raise the pay scale to keep the qualified, trained people already on staff,” she says. “You’ve already invested in their training and education. Why continue reinventing the wheel every time someone leaves the utility?”

“Systems need to recognize the opportunity costs associated with not paying a competitive salary,” says Holloway. “If you added up the cost every time someone left versus paying a competitive or higher salary, the costs of keeping the current worker would probably be less in the long run than spending the money to retrain a new worker to replace the qualified worker who just left.”

Holloway suggests that operators could help to educate water board members about their work by showing them just what is involved in doing the day-to-day work. “Take the board member down to see the cleaning of a clear well to see the onerousness of the job,” she says. “It lets them see first-hand that the work is more involved than just a general laborer’s job and pay dictates.” By doing this, a worker might well lend some credibility to his argument that his work warrants higher pay and more respect.

Seeing Both Sides of the Issue

Jim Stutso is in a unique position as a class I operator for War, a small town of 1,000 residents in southern West Virginia. Before running the city’s water treatment plant, he was a town councilman for six years. Because of his time spent on council, he recognizes the financial limitations that a community has in supporting its workers. With a high percentage of elderly residents on fixed incomes, the town doesn’t have the means to offer workers any benefits. There’s no retirement plan and no health insurance. A treatment operator can expect to be paid roughly $7.50 an hour.

“The money for healthcare and other benefits just isn’t there,” Stutso says. “You have
to respect the mayor and city council because they are trying to improve the situation, but the money just isn’t there.”

Stutso says that while the city can’t offer the financial incentives to keep workers on the job, town officials are using creativity to help make things better for workers.

“Operator input is good,” Stutso says. “Respect is fine. There isn’t really anything more they could do in that area.”

But in addition to treating workers well, the town does what it can to help employees improve their skills. The town recently sent Stutso to a training session across the state. “They covered my travel expense to come to the training,” Stutso says. “The mayor is a retired educator so he supports worker education.”

The mayor’s interest in education led him to start a program for municipal workers that allowed them to get their general equivalency diploma. Employees who opted for the program were granted leave from their jobs to complete their schooling.

But while the city has tried to work within its means to support employees and keep them on the job, the issue of more money faces War again and again. Stutso says the last guy who left the water system took a job with the nearby county public service district, making roughly 88.50 an hour with a 401k retirement plan and hospitalization benefits.

**Tackling Turnover**

Dealing with a turnover rate isn’t a problem that small systems relish. According to the training manual *Managing a Small Drinking Water System: A Short Course for Local Officials*, small systems are especially hard hit with turnover rates because they don’t have the financial resources to lure and retain qualified workers. The training package was developed by National Environmental Training Center for Small Communities, a partner of the National Drinking Water Clearinghouse. The course suggests that a system can prepare to minimize turnover.

“A small water system’s board members usually know the employees and recognize their motivations for job performance,” the manual states. “Not all individuals are motivated by high salaries. While you should try to provide competitive salaries and benefits, you can also find other reasons to encourage employees to stay.”

The manual goes on to say, “Employees may like flexible hours or a periodic bonus. Find out what motivates each individual. This alone is a sign that you value the employee. Note also that many small systems can take advantage of benefit packages offered by the state’s municipal league, rural water association, and other organizations.”

Another key to retaining workers is how they are managed, the manual says. “Do not
What are workers thinking today?

The mindset of today’s workforce is nothing like it was many years ago. At one time an employee would think, “I need to be cautious and not take chances. I will do what I am told. I will learn the rules and obey them. I will be compliant to authority figures and not question their decisions. And above all, I will be loyal and make the boss look good.”

But new culture thinking has changed all that.

Independent thinking in today’s work environment includes, “I’m going to be innovative and creative. I want to be asked, not told. I want the responsibility for making the decisions that will affect my job, my life, myself. I seek risk and live with consequences. I will form alliances, partnerships, and networks with whomever I please. I will be the source of my own satisfaction.”

We are dealing with mixed cultures, beliefs, and traditions. Employees expect more of the company or organization they work for than ever before. If the organization cannot satisfy their needs, they’re likely to make a change. Some of the viewpoints that today’s workforce holds include:

**The Expectancy Factor:**

Management has a responsibility to be clear and concise when explaining to employees just what it expects of them in terms of accountability and performance. Common sense tells us that you can’t hold people accountable for things they did not know they were being held accountable for. In the past, once management communicated its expectations to the employee, the conversation was over. Company goals had been identified. But what about the employees’ goals? Workers today want to see a tie-in between the organization’s mission and their own personal missions. An honest look reveals that today’s workforce focuses first and foremost on personal goals, and secondarily on organization goals. Their expectancy factor translates into: “If I, as an employee, live up to or exceed the boss’s expectation of me and my performance, what can I, as the employee, expect back in return from my organization?”

**Quality Treatment:**

Today’s workforce does not accept the autocratic “my way or the highway” style of management. Now employees require a participative management style from supervisors. Employees want to be part of the decision-making process, and to have a voice in policies that will affect them. They want a work place that offers fair competition and provides outlets for personal creativity. They are attracted to environments where camaraderie with all levels of co-workers is the norm. Hierarchical rank systems, which exclude interactions, are seen as undesirable; systems that encourage and reward teamwork are applauded. Autonomy, dignity, self-esteem, and respect are critical ingredients in today’s workplace.

**Lifetime Skills Training:**

Today’s workers expect support for personal development and long-term growth. Many workers want to be prepared to run a career marathon, not just a career sprint. They seek on-going training that focuses on lifetime skills, and mentors who will contribute to their individual growth. Each manager plays an important role in shaping the work environment. Managers must be well rooted in the company’s philosophy and must understand the company’s value system. Not only must they know the values; they must believe in them and support them enthusiastically. How else can they communicate the organization’s values effectively to their staffs? The way managers communicate and direct their staff will strongly influence the organization’s culture and climate. Even when employees base their service attitudes on personal commitments, the prevailing environment that management establishes influences them.

Retaining Good Employees is Smart Business

Often overlooked in the work of running a water treatment system is the cost of employee turnover, a problem plaguing many businesses and governments. Despite the recent downturn in the economy after years of high economic growth, there may be a shortage of people available to work at the entry level in certain areas of the country. The water industry, in general, is expected to hold jobs for the future as it is not as sensitive to economic fluctuations. A water treatment plant will still need operators. Also, with the education needed to obtain increasing operator certification requirements, water industry jobs will likely gain more respect and interest.

Job opportunities in the water field combined with increased mobility in the work force creates an environment where many people feel comfortable frequently changing jobs for a wide range of reasons.

A major study of the employee turnover problem in traditionally low-wage retail industries [“New Ideas for Retaining Store-Level Employees.” Retailing

Adapted from a presentation made by Dr. Marc Clark, President of M. Douglas Clark & Associates that provides services in asset management, electronic media production, public relations, Internet/Intranet Web sites, and employee enhancement workshops.
Research Council, January 2000] estimated that the total direct and indirect cost of replacing a worker earning $6.50 per hour was at least $3,637. While these specific numbers apply to traditional jobs such as cashiers, similar situations exist for drinking water utility workers due to the high cost of training.

In her book The Road to Retention: Build and Keep a Strong Workforce, Ann Jones states that cost components, such as recruiting, interviewing, hiring, processing, orienting, training, supervision, and overtime paid to employees to cover for the person who left, represent the direct costs of turnover. These direct costs are relatively easy to measure and quantify in dollars. However, as Jones points out, turnover also creates indirect costs that are less easily measured, but which also negatively affect a business or organization. Some of these less obvious costs are customer dissatisfaction, inexperience of new employees in handling problems efficiently, decreased quality due to errors, and reduced morale of co-workers who are charged with training another new person.

Each of these components must be measured and understood to appreciate the bottom line cost of turnover and, therefore, the economic value of retaining good employees.

In addition to the obvious dollar cost of turnover, managers or board members should also appreciate the more subtle economic benefit of good employees. Good employees are key to the customer-oriented marketing approach that is critical to keeping customers happy. And happy customers who are treated well by your employees face to face or don’t have to deal with a water supply interruption may be less likely to fight a rate increase when the system needs one.

Recruiting and retaining good employees are challenges in today’s labor market. However, the long-term rewards to water systems for retaining quality employees are well worth the effort.

Be Creative with Retention

Unemployment rates are at their lowest levels in more than two decades. Employers, including water utilities, are struggling to keep good employees from jumping ship. They realize that providing an environment where employees enjoy coming to work means more than just supplying an office and medical benefits.

According to Laurie Dreyer, director of human resources for a company that recruits prospective employees for small businesses and local governments, the secret to retaining employees is to value employees. Dreyer says she’s seeing businesses that now allow people to pursue their own passions. “If you do things that you love, work isn’t work. It’s a passion. And what could be better than waking up in the morning and going to do something you love? Now this may not always be possible in America, but I highly suggest that organizations try to match a work interest with an employee.”

Another key factor is providing opportunities for people to develop their skills. “We see organizations trying to be future oriented,” says Dreyer. “They’re asking employees: ‘Where do you want to go? What do you want to learn? How do you want to learn it?’”

Dreyer says organizations now provide tuition reimbursement, in-house courses, and skill development through assignments to different types of projects. “I see companies willing to move people around based on what their passions are,” she explains. “If a city clerk wants to move to the police department or payroll office, governments need to work with that employee. The alternative is that the employee will likely look elsewhere for a job if he or she knows the local government isn’t keen about moving employees.

“The worst thing a supervisor could do to an employee’s attitude about his or her job is pigeon-hole that employee into only one job category,” says Dreyer. “Poor supervisors seem to think, ‘Well, Luke has always been a laborer, and he could never be anything else.’

The reality is that Luke probably would love the opportunity to move up and into another higher-paying position. The only thing holding Luke back is the supervisor who can’t see his way around a current job title.

Employees expect more of the company or organization they work for than ever before. If the organization cannot satisfy their needs, they’re likely to make a change.
"It’s sad to say, but many poor employers or supervisors focus on the current rather than on the future capabilities of an employee,” says Dreyer. “They’ll probably spend time and money recruiting for outsiders for a position and never once consider the talent they already have in house.”

Matching Benefits with Employees

With the current economy, business and government is recognizing that the workforce is highly mobile, with many workers jumping from job to job throughout their lifetime. To discourage that job mobility in a productive worker, employers must be willing to be flexible to the specific needs of the worker.

“Giving prospective employees what they want—within reason—is critical,” says Barbara McCarthy, a human resources specialist for a “head-hunting” firm that locates workers for specific jobs and then tries to entice them into switching to another company.

McCarthy says that many employers now offer benefits packages that consider the needs of employees of different ages. “What a 20-year-old needs is very different from someone with a family and kids and very different from someone who’s getting ready to retire,” says McCarthy.

Thus, firms, and even local governments, are offering flexible benefits packages suitable to an employee’s present stage of life.

One benefit that seems popular across the board is a paid time-off policy. Sick leave and vacation days are not defined. Employees are given a lump sum of days off to use as they wish.

### Key Management Principles for Retaining Employees

1. **Management is a Role Model**
   
The impact a manager has on an employee's perception of the work is everlasting. Either the manager is held in high esteem or not. It is surprising to think that to employees, a manager can be the greatest mentor they have ever known or the worst. Managers must realize that they are being evaluated by the employees they supervise. It is important to understand that what managers do often communicates values more strongly than what they say. If the organization suggests one set of values, managers must not work under another.

2. **Create a Work Environment Where Workers Feel Secure**
   
   Establish a work atmosphere where the sum of the individual parts is greater together then if they stood alone. Workers today have a desire for fewer social divisions by rank. The most successful work areas are those in which workers feel a common bond with others in their peer group. Workers tend to migrate toward those individuals who share similar feelings, opinions, and attitudes. To be secure in their work environment, people need personal contact, friendship, and the feeling of belonging. If they feel they are a third party outsider or don’t belong, they don’t stay. A team structure supervised by participating management is the answer. Interactions within groups strengthens the group.

3. **Treat Workers With Dignity**
   
   Every employee in your organization is worthy of your respect. Each deserves to be treated as an adult and not as a piece of equipment. Management must be familiar with each staff member to know what makes them tick and what brings satisfaction to them in the workplace (rewards other than pay). Sensitivity is a must characteristic for the supervisor of the future; the norm will be for managers to be sensitive to workers’ needs, wants, and personal expectations. A positive side effect of sensitivity, both for management and employees is the identification and best use of employees’ special talents. Knowledge also allows managers to support workers’ creativity and resourcefulness, as well as respecting employees cultural and personality differences.

   The biggest gift managers can give their staff members is a dose of self-esteem. Workers need to be convinced that whatever position they hold, whether billing clerk, meter reader, laborer, water operator, maintenance engineer, or general manager, their contribution is important to the success of the utility. They must also come to believe, through strong orientation/reinforcement programs, that they as individuals are important to the organization’s success. The mindset of the worker should be one of pride in position and in self. They must not feel like interchangeable, replaceable clones just doing the job.

   If you desire to create a work environment that will let your employees know that you value them, and want them around for the long hall, you might consider adding the following characteristics to your daily operations:

---

Adapted from a presentation made by Dr. Marc Clark, President of M. Douglas Clark & Associates that provides services in asset management, electronic media production, public relations, Internet/Intranet Web sites, and employee enhancement workshops.
McCarthy explains the attitude: “You’re adults. Here’s your time. Go do what you want. You don’t have to give me a doctor’s note.”

Flexibility and coping with change are key factors in keeping and retaining good employees in today’s workplace, says McCarthy. Even with some businesses’ low turnover rate, some employees do leave—and about 10 percent of them come back.

“We encourage employers to give them an Australian boomerang when they come back,” she said. “It’s a time of celebration. An employee who left, perhaps to improve his or her skills or dealt with a family situation, should be welcomed as a valuable part of the group. “You went out, you learned something, and you decided this was really where you wanted to be,” she says.

Board Members: Work With Staff
Mike McNulty, executive director of the West Virginia Rural Water Association, says that water systems are going to continue to see employee hiring and retention problems in the future. How managers work with—or against—their workers could go a long way in alleviating or compounding the problem.

“With the training and education requirements that are coming, small communities are going to find it harder to find the workers they need to run the plant,” McNulty says. “The war cry I hear is money. The problem is that many people don’t see civil servants like operators in the best light. They don’t see them as being professionals with an enormous amount of responsibility.

“Some boards think their role is to micromanage,” he continues, “and that is not their job. If you hire a general manager to do the job, then let him or her manage. The board should be there to check off and approve the general managers work or recommendations.”

The Small System Guide to Board Responsibilities for Operation and Maintenance, a publication of the Rural Community Assistance Program, Inc., says, “Don’t give your operator five bosses!” The guide suggests that boards “designate one person on the board to ‘supervise’ the operator. This board member should act as the link between the operator and the entire board, and should be fairly accessible if the operator needs to ask questions. At no time, unless it’s clearly understood by the board and the operator, should anyone but the designated board member give instructions to the operator.”

For more information about the training package Managing a Small Drinking Water System: A Short Course for Local Officials or to purchase a copy of the manual, contact the National Environmental Training Center for Small Communities at (800) 624-8301.

To obtain a copy of Small System Guide to Board Responsibilities for Operation and Maintenance, contact the Rural Community Assistance Program at (703) 771-8636.

The National Drinking Water Clearinghouse would like to know your utility’s creative strategies to retain employees. Besides more money, what have you done to lure and retain operators? What you do could well help other systems across the country in retaining their workers. Send retention strategies to Jamie Knotts at jknotts@wvu.edu. If we learn of other retention methods not mentioned in this article, we’ll publish those in an upcoming issue.

Jamie Knotts, assistant editor, welcomes article ideas and suggestions from readers. If you have an interesting topic you think others would enjoy reading about, send a note to jknotts@wvu.edu or call him at (800) 624-8301.

Chris Metzgar, graphic designer and diplomat, is filling in for Julie Black who is on maternity leave.
Unless the water utility you manage is in Texas, you need workers’ compensation insurance for your employees. It’s required in every state but the Lone Star and covers employees’ medical expenses and lost wages if they are injured on the job.

As Heather Williams notes in her article “The Basics of Workers’ Compensation Insurance,” laws vary from state to state, but the basic premise is that workers’ compensation is a compromise: Benefits are paid regardless of who is to blame for an accident or injury. This no-fault status, she writes, is key to workers’ comp—the employer does not admit liability for the injury or illness and recoups workers’ comp benefits without having to sue. “There’s no room for horseplay, drunken stumbling, or illegal drugs, though—if any of those lead to an injury, workers’ comp insurance will not pay,” she writes. “The same goes for self-inflicted injuries and for injuries incurred while a worker is off the job, committing a crime or violating company policy.”

For the employer, states mandate how much coverage an employer must buy and what percentage of the employee’s salary the employer must pay if an employee misses work due to a work-related injury. In some states, employers who meet minimum payroll or employment levels can self-insure, that is, not use an insurance company and, instead, pay workers’ comp claims out-of-pocket.

In some cases, employers—usually those with only a few employees—are exempt from carrying the insurance at all. The most common exemption is for employers with fewer than three employees, but some states provide the exemption to employers with fewer than four and others to employers with fewer than five. Of course, even if a business or utility is exempt, they may still be able to participate in the program if they choose.

And to make things more confusing, not all states require all employees to be covered under workers’ comp insurance. Frequently excluded workers include domestic employees in private homes, farm workers, maritime workers, railroad employees, and unpaid volunteers.

Because each state clearly defines requirements, workers’ comp packages offered by insurance companies are fairly standardized, with little variation among policies. Basic workers’ comp coverage includes medical treatment, rehabilitation costs, and lost-wage replacement, covering up to two-thirds of an employee’s regular salary while he or she is out of work. Many workers’ comp policies also include liability coverage, which kicks in if a worker’s family sues you for damages stemming from a workers’ comp claim.

**Do employers have a choice for their insurers?**

Not surprisingly, the states determine from whom an employer must buy workers’ comp insurance. North Dakota, Ohio, Washington, West Virginia, and Wyoming require employers to buy workers’ comp insurance through a state agency. These states, however, do not include employer liability insurance with their workers’ comp coverage. Liability insurance must be bought separately through a commercial insurer.
In other states, some of the nation’s largest insurers control the biggest slice of the workers’ comp pie. Liberty Mutual leads the pack in terms of premium dollars, followed by National Union Fire Insurance Company, Kemper, Travelers, and The Hartford.

If your water utility is in a state that does not require businesses to purchase insurance through a state-appointed agency, and you are looking for workers’ comp, there may be two options in addition to private insurance: state insurance pools and self-insurance.

State workers’ comp insurance pools are similar to high-risk health insurance pools that operate in some states. These pools cater to the “residual market,” or companies or utilities that can’t buy workers’ comp insurance through normal means because they’re considered too risky. A poor safety track record or above-average number of claims could put a business or utility in this category. For that reason, buying workers’ comp insurance from a state pool is fairly costly.

In 47 states, businesses of a certain size have the option of self-insuring. This means they take on the risk of paying for work-related injuries themselves instead of paying an insurance company to do so.

Choosing the Right Agent and Carrier

If your utility uses a commercial insurance company, chances are the water system’s manager will choose a policy with the advice of a commercial agent. Ideally, that person should be able to work as the utility’s advocate with the insurer, says Brenda Vincent, vice president at Marsh Advantage America. Picking the right insurance company can make a big difference when it comes to a workers’ comp claim.

“Accidents happen, but fewer accidents happen in safe workplaces. Taking necessary safety steps reduces injuries and means reduced business losses, reasonable insurance rates, and safer workers.”

North Dakota’s Workers’ Compensation agency

“Insurers familiar with the industry can reduce the effect of claims on customers through good loss control and claims departments,” Vincent says. “And the agency should understand that different states have rules that affect the workers’ comp rate, and be an advocate for the client in promoting the safety controls that warrant credit toward a lower premium.”

Controlling Costs

Workers’ compensation funds are feeling the strain as employees report more difficult-to-treat injuries. Now, private employers are showing hard-pressed public employers how to bring costs under control, says Tina Ruyter, a claims representative with Asset International, Inc.

“State laws govern how local governments and municipalities manage health care for injured employees,” Ruyter says. “Some states have laws that give public employers less control over their workers’ comp costs than private sector employers have. More often, the same laws govern workers’ comp coverage for both the private and public sectors.

Most states require coverage and set guidelines for how it should be provided. The original intent of the laws was to protect employees, but increasingly laws are intended to provide a balance between employer and employee interests. If employers self-insure, they can hire an outside administrator or self-administer, and they often buy insurance to cover catastrophic costs above the normal expense of day-to-day care. Employers can also choose to buy insurance for normal and catastrophic costs.

“The root of the problem, in large part, is the increasing number of claims for ‘soft tissue’ injuries to backs, elbows, knees, and wrists,” Ruyter says. While the numbers are difficult to dissect, one indication of the increase in these types

Continued on page 23
Those investigating workers’ compensation fraud have spotted several indicators that an employee may be using and abusing the system to get a free ride. As an employer, you might take note of the following behaviors. Although no single item listed below can effectively prove fraud, taken collectively these behaviors may help you to identify a problem employee.

1. Employee has an extensive history of previous claims, including bodily injury or property damage claims or a history of falsifying claims.
2. A substantial delay occurred in reporting the accident.
3. The employee is never at home or is reported to be in bed under medication or is otherwise difficult to contact.
4. The employee refuses to go to the medical provider selected by the employer or refuses a diagnostic procedure to confirm an injury.
5. Employee frequently changes physicians or medical providers.
6. Employee has subjective, soft tissue injuries only: no objective injuries such as broken bones or cuts; there is no present organic basis for his injuries; or the disability claimed is beyond normal for the injury, either in rating or length of time.
7. The employee has a long relationship or history with a health care provider [other than his family doctor].
8. The employee has post-traumatic psychological stress-type claims or complaints.
9. Employee has excessive prescriptions.
10. Employee is either new on the job or nearing retirement age; or the injury coincides with layoffs, closings, early retirement offers, or firings.
11. Employee has a high absentee rate.
12. Employee benefits from workers’ compensation, other social programs, or other insurance or disability plans equal or exceed the employee’s regular take-home pay.
13. The employee has a history of self-employment or working for cash.
14. The injury occurs late on Friday afternoon or shortly after the employee reports to work on Monday.
15. The accident was not witnessed by anyone else.
16. Details of the accident, as found in the employee’s first report of the claim, the employee’s medical history, and third-party accident reports are vague or contradictory.
17. After the accident, the employee moves out of the state or country.
18. The employee receives mail at a post office box and has no reason for doing so.
19. Employee seeks treatment from a chiropractor only, and a medical doctor never examines him or her.
20. The treating physician is known for being involved in suspect claims.
21. Several different doctors are involved, and no one doctor is coordinating the medical treatment.
22. Physician or chiropractor will not consider employee returning to work at any level as part of the rehabilitation or treatment program.
23. There are substantial gaps in treatment.
24. The location of the treating doctor or chiropractor is inconsistent with the employee’s home or work location.
25. The treatment or diagnosis is inconsistent with the employee’s injuries.
26. Treatment occurs on holidays, weekends, or vacation.
27. Rehabilitation reports note that the employee is tanned, muscular, has callused hands, or grease under the fingernails inconsistent with the disabilities claimed.
28. Co-workers or ex-spouses, either upon questioning or while making complaints, begin telling you of the employee’s activities, such as sports or home repair.

Source: Adapted from Missouri Employers Mutual Insurance Company’s Fraud Alert pamphlet
of injuries is the appearance of carpal tunnel syndrome (CTS). In 1982-83, employers did not see enough incidences of CTS to report them separately in the National Council on Compensation Insurance survey. By 1992-93, CTS represented 1.7 percent of injuries among the private-sector employers in 40 states that were surveyed.

“Soft-tissue injuries can be more expensive than more visible injuries, such as broken legs or cut fingers,” says Ruyter. “Reaching agreement with an employee about when, and if, the injury is cured can be impossible if the employee insists that a strained wrist or knee still hurts. The employee’s private physician will often agree that he or she is still injured and cannot return to work. The medical profession has no way to prove whether or not the employee is lying. This element of doubt can delay the employee’s return to work and eventually can lead, in extreme cases, to disability retirement for those who do not want to return to work, adding to costs for retirement systems by turning employees who might still be contributing into early retirees.”

Tips for Employers

After an injury occurs, an employer can do several things to help the injured employee have an early and safe return to work and keep worker’s compensation costs down.

According to North Dakota’s Workers’ Compensation Agency, employers should:

• Stay in contact with the injured employee. Help the injured employee continue to feel that he or she is an important asset to the company or utility.

• If the doctor restricts the injured employee’s work, provide transitional or modified work duties. Provide the employee with a written transitional job offer that outlines the proposed job, work hours, and effective date.

• Investigate the incident that led to the employee’s injury. Do this immediately and address the following items:

• Look at the accident site.

• Determine why the incident happened.

• Document the circumstances surrounding the incident.

• Secure evidence and take photographs.

• Interview all witnesses and write down their statements.

• Take the necessary corrective action to prevent the injury from happening.

To head off future rate increases, North Dakota’s Workers’ Compensation Agency recommends that employers focus on safety. “Accidents happen, but fewer accidents happen in safe workplaces. Taking necessary safety steps reduces injuries and means reduced business losses, reasonable insurance rates, and safer workers.”

Workers’ Compensation Tips for Employees

The Gillman Insurance Group of Alpharetta, Georgia, offers this advice to employees: First and foremost, don’t lie about the injury. This not only can cause a lot of hassles, it is illegal in most, if not all, states. If you really hurt yourself playing softball last night, don’t do something stupid like say you hurt yourself at work. You will get caught.

Don’t exaggerate your symptoms expecting to receive a big payoff. It does not happen in workers’ compensation. The state’s workers’ compensation board or agency strictly regulates all disability payouts.

It is important that you try to prevent all injuries, not look for them. Prevention is the name of the game. By preventing injuries, it saves the utility money, which in turn can be passed on in pay raises and other benefits.

Make sure that you are properly trained and qualified for the job you are taking on. Pay attention to your supervisor or whoever is training you for the job. They want the job done correctly, the first time. Redoing the job means time and money for both you and the employer. Have respect for the employer.

If you are injured and put on temporary disability, keep in touch with your supervisor. Let them know what is going on, how you are doing, and when you are expected back. In other words, let your employer know that you are not just sitting home watching Oprah, hoping that you don’t have to go back to work.

For more information about workers’ compensation, contact your state employment bureau.
An American Operator Explores the Horn of Africa

How did a water guy from West Virginia end up in Ethiopia? Well, being in the right place at the right time certainly helped. It also did not hurt that the little hair I have went gray from almost 30 years of working with and worrying about the rural water systems in West Virginia. Whatever the reason, Robert Roche, Ph.D., lead sanitary engineer for the World Bank, invited me to make the two-week trip. He didn’t need to ask twice.

I would spend the first week attending the “International Conference on Water and Sanitation Services in Small Towns and Multi-Village Schemes” held in Addis Ababa, capital of Ethiopia. The second week would be spent visiting rural drinking water systems throughout the country. Also making the trip to attend the conference was Sanjay Saxena, director of the National Drinking Water Clearinghouse (NDWC).

Editor’s note:
Currently, Ethiopia’s Ministry of Water Resources uses World Health Organisation drinking water standards for design and monitoring purposes. However, the ministry recently conducted a water-standard study and plans to adopt a new water-quality standard for the country. The standard was not complete at the time this article was written.

Story and Photos by Larry Rader,
NDWC Environmental Consultant
The Adventure Begins

My month-long series of vaccinations was over, the visa arrived from the Ethiopian Embassy in Washington D.C., and I had packed enough stuff to allow me to survive anywhere in the world for several years. My banjo was going along at the request of Bob Roche, and I purchased two cartons of stick candy knowing there would be children. In other words, I was ready for anything.

On June 9, 2002, Sanjay and I took off, and after 23-and-a-half hours, we arrived at Addis Ababa tired, excited, and wishing it were daylight. In spite of the long trip, I was up early and ready to check out my new surroundings. The first thing I discovered in Ethiopia was the coffee. Coffee was first found in Ethiopia. The Kefa region is named for it, and their coffee, served hot, strong, black, and sweet, has evolved into absolutely the finest drink anywhere. Not wanting to insult the culture, I enjoyed five cups (the cups are small) of this delicious brew.

The International Conference on Water and Sanitation Services in Small Towns and Multi-Village Schemes was held June 11–15 at the United Nations Conference Center in Addis Ababa, Ethiopia. It was hosted by the Ethiopian government through the Ministry of Water Resources and sponsored by the World Bank, the Water and Sanitation Program, and the World Bank Institute, as well as the United Kingdom Government and the Bank-Netherlands-Water Partnership. The conference drew more than 200 practitioners from all continents. About 70 percent of them were from Africa, and the majority had more than 15 years of experience in water and sanitation.

In some ways, the conference reminded me of the meetings and conferences that took place after the rest of the U.S. discovered Appalachia’s problems in the 1960s and ’70s. Occasionally, words like innovative technology, privatization, and “the people are just not capable,” caused the hair on the back of my neck to rise.

As you might expect, a few people seemed to feel the answer to any problem was only an academic exercise away. These small personal issues aside, the formal part of the conference was informative and extremely well presented, particularly the case studies. At the end of five days, I had a much better understanding of the problems facing developing countries, although I was still somewhat confused about the solutions.

The informal part of the conference was a more useful learning experience for me. By informal, I mean sitting and talking over coffee. We discussed a number of matters in detail, such as government interference, the extremely high cost for most operation and maintenance items, potential customers who did not always agree with change, and the ever-popular “expert with a theory.”

The greatest thing about these discussions was, believe it or not, most of the complaints were already familiar to me from back home. Some of the most eye-opening discussions occurred while listening to the views Africans have of the U.S. The fact that the U.S. has large rural areas and that many of those rural areas have drinking water and wastewater problems was inconceivable to most of the people I talked to.

First, you need to realize that their impressions of the U.S. come almost entirely from movies and TV. The prevailing view seems to have New York City extending west until it meets the suburbs of Hollywood-Los Angeles. We are all thought to be rich, living in large homes, and driving big expensive cars. Telling people that I lived in a poorer, more rural part of the U.S., had grown up drinking water fetched from our well, and

Fetching water for the family is usually a job for young girls.
using an outhouse to answer the call of nature caused looks of complete disbelief.

During the second week of my trip, which was spent visiting rural communities, the people traveling with me would sometimes use these little-known facts from my past as part of my introduction. Who would have thought the time I spent sitting in that darned outhouse dodging wasps would 50 years later cause me to appear a little less foreign to people half way ‘round the world?

First Stop: Adigrat

Once the conference ended, my week of visiting rural water systems began. Our group assembled at the Bole airport to make the 7:30 a.m. flight from Addis Ababa north to Mekele. Adigrat is in the northern region of Tigray and just south of the border with Eritrea. The project in Adigrat is representative of other water projects in larger communities.

The cast of characters for this trip would stay the same for the remainder of the week: Bob Roche, lead sanitary engineer, and Catherine Revels, senior financial specialist both from the Washington, D.C. office of the World Bank; Yitbarek Tessema, water and urban operations officer; and Tesfaye Bekalu, Water and Sanitation Programme/Africa (WSP/AF) program assistant, guide, teacher, and soon to be good friend. Yitbarek had the unenviable task of coordinating the entire week, and Tesfaye had the equally difficult task of keeping me out of trouble. Both work out of the World Bank Country Office in Addis Ababa.

A little over an hour after taking off from Addis Ababa, we were on the ground in Mekele where two SUVs were waiting. One would take Bob, Catherine, and Yitbarek to meet officials from the regional water bureau and local politicians. The other would take Tesfaye and me 125 kilometers (km) north to the town of Adigrat where a water system upgrade was under construction.

We stopped at the Tigray Bureau of Water long enough to pick up Zrae Ali, a chemist and water quality expert, then continued north and arrived at Adigrat in late morning and went directly to the plant site.

The tanks and buildings of the facility were constructed of concrete or concrete blocks. The site included a building for the gas chlorinator, a building for the emergency generator, and a third for other supplies. Two new concrete storage tanks were also built, one 200 cubic meters (52,840 gallons) and one 100 cubic meters (26,420 gallons) to supplement the existing 300-cubic-meter storage capacity, giving Adigrat a total of 600 cubic meters (158,520 gallons) of water in storage. Six wells drilled to depths of 120 meters to 150 meters (394 feet to 492 feet) supply the water that requires only disinfection.

The plant site is enclosed within a barbed wire fence for security. A barbed wire fence also surrounds a new building that is centrally located in the well field, housing electrical controls. The upgrade included 10 kilometers (km) (32,810 feet) of new pipe, giving the system a total of 21 km (68,901 feet) of distribution lines. In addition, workers are building pit latrines and community showers as a part of the upgrade.

When the new system is completed this year, it is projected to serve a population of approximately 60,000 people. By 2015, the population is expected to increase to 100,000, which will be largely due to the water system upgrade.

Although Adigrat is certainly an urban community, we would consider the process of getting water to the customers a bit unusual. Consider this: of the 60,000 present customers, only about 6,000 homes will choose a household connection. However, only 200 homes or less will actually have water
plumbed into the house. The remaining household connections will serve a faucet just outside the home.

The flat rate for a household connection is 1.5 Ethiopian birr, or around 17 cents in U.S. dollars, for one cubic meter (264.2 gallons) of water. However, even when new systems are built and water is made available, most people will continue to carry it home in containers as they have for centuries.

As a part of the upgrade, Adigrat will construct 30 locations where people can purchase water by the bucket. They may be called water points, fountains, standpipes, or locally “bono” and are spread evenly throughout the community. Employees of the water system operate and maintain these water points.

Forty liters (10.5 gallons), or the equivalent of two buckets of water, is sold for approximately 5 cents Ethiopian or slightly less than one-half cent U.S. currency. The cost comes out to around 50 cents per 1,000 gallons. So the next time your customers complain about water rates, you might consider building a few water points and handing out buckets.

Ethiopian households average five people, and design standards for communities like Adigrat use 30 liters (8 gallons) per person per day. This means that someone, usually young girls, must carry 40 gallons of water home each and every day.

With any luck, as Ethiopia continues to decentralize many governmental functions, the decision-making process that Adigrat uses will become more common. The community is divided into four sections or kebeles, and the people living in each kebele elect a representative to serve on the water and sanitation committee (WATSAN). These representatives serve for a set amount of time, usually between three to five years, and in most cases are unpaid.

The WATSAN is responsible for the day-to-day activities of the water system and answers directly to the town council. The new water system plans to employ approximately 50 people, including water sellers. And, it is important to note, the community has insisted that women hold important positions. Adigrat should do well.

This hand pump supplies water for approximately 500 people in the small village of Zenzelema, located just outside the City of Bahir Dar.
The only problem they encountered was a difficulty in obtaining pipefittings and some electrical controls, which brought construction to a halt. Unlike the U.S. where you call a supplier and a truck shows up the next day, Ethiopia does not have companies who stock municipal supplies. Items not produced there are imported, apparently as needed, which really slows things down.

The Adventure Continues

Following the trip to Adigrat, we were up again before dawn for the drive to Awassa located in the southern region of Sidamo. The road from Addis Ababa to Awassa is paved and very well maintained, so we decided to drive. The drivers for the World Bank, the best I have ever ridden with, consider any speed less than 120 km per hour (approximately 74.6 miles per hour) a complete waste of time. So off we went, one foot on the gas and one hand on the horn.

About an hour out of Addis—after passing every donkey cart on the road—the radiator on the Toyota SUV cracked. As we formed a group at the front of the vehicle to offer opinions, all of those donkey carts had the chance to pass us with driver, passenger, and donkey, all smiling. Just at that moment, a local bus stopped, and Yitbarek, now acting tour director, arranged for us to continue the trip to Awassa in a more leisurely fashion.

Bob, Catherine, Yitbarek, and Tesfaye went to the Southern District Water Bureau to discuss upcoming projects. I headed for the Awassa Town Water Supply office. As it turned out, the system's supervisor, Letta Yetamo, didn't know I was coming. It was obvious that Letta was in the middle of a very busy day; however, with the courtesy that is so typical there, his face only fell slightly when I asked to see his treatment plant at the end of a dirt road located several kilometers from town.

What a plant site! Built at the base of a mountain where a small, fast, running stream provides raw water, it is the most beautiful location for a water plant, or anything else for that matter, that I have ever seen. And because of the remoteness, the community built a house nearby for the chief operator. The treatment process is conventional coagulation, flocculation, and sedimentation, using lime and alum. Gas chlorine provides disinfection, and the lab is equipped with HACH company products.

With the exception of the lush, tropical trees and flowers of the landscape, I could have been anywhere in the U.S. Built in 1982 and designed for a population of 60,000, the plant now supplies water to 150,000 people and is long overdue for an upgrade. Obviously well operated and maintained, it would be a credit to any community anywhere. The Awassa system provides water to several water points as well as to private household connections. I almost applied for a job.

On to Bahir Dar

Located in the Amhara Region in the northwest part of Ethiopia, Bahir Dar is situated on Lake Tana, birthplace of the Blue Nile River.

Once again, I was up before dawn to catch the early flight. The rest of the group called on the local water bureau while I visited some small water points and one community with a five-year-old pipe water system. Pipe systems are just that, systems that distribute water through pipes to locations other than the well site.

However, the most common installation for smaller communities consists of a well and a heavy-duty hand pump. I saw several of these throughout the countryside, usually serving populations up to 500 people. A few kilometers outside Bahir Dar, the small community of Zenzelema built one such installation next to a health clinic.

Although walking half a mile to get water from a hand pump may seem very inconvenient to us, people in these communities have carried water from wherever they could find it, generation after generation. Not only could the distances be great, the water was most often of questionable quality, causing many deaths from waterborne diseases. Bringing safe water to small communities also provides more than health benefits. Drilling a well close to a community may actually allow some children to attend school.

Carrying water is a job usually for female children. If the distance is far, it can easily
turn into a full-time effort, allowing little time for school. Something as simple as a well with a hand pump can have a dramatic effect on many lives in many ways.

The last community I visited was Ambasame Town, located several kilometers outside Bahir Dar. Again, a long ride over a dusty road brought us to an isolated community with a population of around 6,000. A metered well drilled to 60 meters and a generator-powered pump supply the water. The generator looked so good I thought it was new. As it turned out, the generator came with the system five years earlier. The pride these people have in their water systems shows in everything they do. Out of the population of 6,000, only five homes have private household connections and the rest purchase their water from six public fountains. The average use is approximately 30,000 liters (7,926 gallons) per day or 1.3 gallons per day (gpd) per person. In the U.S., the average use is 150 gpd per person. The water requires no treatment.

The next morning Tesfaye and I flew back to Addis Ababa where I spent the remainder of the day packing for my trip home. Then, almost before it began, my two-week adventure was over, all of the candy was gone, and I boarded a plane for the 23-and-a-half-hour flight home.

Professional Observations and Conclusions

One of the reasons the situation in Ethiopia was familiar to me is the manner in which well-meaning people rush to do something, anything, in an attempt to soothe their guilt at allowing these conditions to exist. When the U.S. government discovered the water problems in Appalachia and other rural areas of the country, the first impulse was to throw large amounts of money at the problems. However, training and technical assistance must be an integral part of funding.

The initial funding is an essential part of the process. But, without providing the community with proper training and technical support, that new system can become more of a burden than a blessing. Building a new system for any rural community is the easy part. The difficulties occur over the next 25 years.

In the U.S., the Rural Development Administration (RDA) provides a major portion of funding for rural systems. RDA, being a quick study, realized rural systems need support not only before, but also after systems are built. Technical support helps protect the initial investment and gives communities the necessary tools to maintain viability.

People in rural communities are every bit as intelligent as their urban counterparts.

Continued on page 31
Ethiopia Is Both Breathtaking and Extraordinary

When I first arrived in Ethiopia, I didn’t know what to expect. Torn by bloody coups, uprisings, wide-scale drought, and massive refugee problems, Ethiopia is a country in desperate need.

A two- and-a-half year border war with Eritrea finally ended with a peace treaty on December 12, 2000. The war strengthened the ruling coalition but hurt the nation’s economy. The war forced the government to spend scarce resources on the military and to scale back ambitious development plans. Foreign investment declined significantly.

Ethiopia’s recent history has been as rough as the roads it left behind. I wasn’t much worried about war breaking out, but riding on the rock and gravel roads to visit the country’s water systems was a killer.

Ethiopia’s scenery, however, soon made me forget the bumpy ride—high desert with mountains on all sides, very little visible surface water, and air so clear it sparkled. As we rounded a bend in the road, we spotted a camel caravan stretching for 200 or so yards to our left. The unexpected appearance of the caravan so surprised me I didn’t get a photograph—one of the thousands that I missed.

The houses in the high-desert countryside around Adigrat are constructed of locally cut stone, low to the ground, a layer of sand on the roof, and a few small windows all designed to retain the cool or heat, depending on the season.

As I traveled farther south, I noticed that in rural areas people constructed their houses in a much different way when compared to the high-desert country in the North. As you would expect, people build their homes using the material that is most readily available. The homes in this region are round, about 10 to 15 feet in diameter, with conical roofs. The walls are constructed of poles or reeds that are set upright and woven together using vines or cord. The conical roofs are thatch.

Houses constructed in this manner are common all over Africa because of the comfort they provide in hot climates. Besides noting how people built their homes, I also began to notice the methods the local farmers use.

Ethiopia’s economy is based largely on agriculture, and there’s not a tractor in sight. Oxen pull spear point plows to work the fields. Cattle and goats are everywhere, usually in the middle of the road. Grain crops include maize, wheat, barley, and sorghum. But the grain most widely grown in all areas of the country is tef. Although the seed is smaller than a pinhead, locals say that one portion of tef each day can sustain life and two portions insure good health. Tef is also capable of producing when all other crops fail.

At the end of my stay, my new friend Tesfaye invited me to have dinner at his home, and to meet his wife Addis and five-year-old daughter Dinna. Addis prepared coffee in the traditional manner. She first roasted the beans over an open flame, then hand ground them in a wooden mortar and pestle, and finally made the coffee I had grown to love.

The meal consisted of beef in a fiery, red, pepper sauce along with boiled eggs, all eaten using injera, a steamed, slightly sour pancake. A bottle of Ethiopian wine crowned a perfect meal. After returning home, I learned that in Ethiopia, licking your fingers during a meal is considered impolite. I am truly sorry Addis; however, each bite was just too good to waste.
On Tap. Fall 2002. 31

However, anybody new to the job must learn the skills necessary to operate, maintain, and manage a water system. Once RDA reached this point, it began to fund groups, such as the National Rural Water Association and the NDWC, to provide much-needed support. Groups such as these offer quick access to information and help that otherwise would be either too costly or too far away for most communities.

If you think about it and use just a little common sense, the best way to help rural communities operate and maintain their new water systems is to make someone available to them who looks and talks like them and has the skills necessary to provide onsite training and technical assistance.

This approach also answers the worn-out argument used against all rural utilities, “they cannot afford to hire enough qualified people.” The argument is no doubt true, but darn it, they can afford to hire local people both willing and capable of being trained. That is what a community water system is all about. To believe otherwise, in my opinion, is elitist.

What would I do if I had the opportunity and resources to benefit the water and sanitation systems in Ethiopia? I can only speak from my experiences in West Virginia, but I do know what works here. I would hire one or two highly motivated people from each region, preferably with work experience. These people would receive further training in system operation, maintenance, and management.

Although it would be foolish to expect anyone to become an expert in all areas, the people doing these jobs must be trained well enough to recognize a problem and knowledgeable enough to know where the solution can be found. Problem solving, at least in rural utilities, cannot be taught. A majority of the education comes through experience gained on the job. In other words, if you hire the right people, they will literally train themselves along with the people they are helping.

The next step is gaining the trust, confidence, and, I hope, friendship of the communities you intend to help. If this step is not taken, all of the knowledge and information in the world won’t matter.

The people in these jobs also must take on the responsibility to research, develop, and circulate written information for training purposes. Training can be as simple as teaching an operator how to troubleshoot electrical problems or as formal as meeting with decision makers from several communities to discuss the importance of long-range planning. Although travel can be a problem in rural areas, bringing representatives from several communities together in the same location allows for interaction among the different groups.

Many years ago, when I took the job as circuit rider, I received a road map and the following instructions: “Help all of the small water systems in West Virginia.” I took those words very seriously, and I know there are many people in Ethiopia who will do the same.

**My Personal Observations and Conclusions**

Ethiopia is the oldest country in Africa, possibly the world. These are proud people who are not the least interested in becoming welfare clients of the rest of the world. They are only interested in providing their families with the basics of life and their children with an education—just like the rest of us. Ethiopia and Africa in general deserve our help and our knowledge because, after all, it does look a little too familiar there to those of us living in rural America.

A few years ago, I read that a visit to Africa will change you forever, and I am proud to say that it has changed me. If you consider the people to be the wealth of a country, then Ethiopia is indeed one of the richest countries in the world.

Larry Rader lives and works in his hometown of Beverly, West Virginia.
No drinking water system can avoid water loss. It comes with the territory. And let’s face it: old or poorly constructed distribution systems are the main culprits. No matter where the fault lies, though, water loss is more than a nuisance—it’s an economic menace. But small drinking water systems can rest assured that good news does exist. These systems can minimize revenue loss just by calculating unaccounted for water (UAFW).

Drinking water utilities can describe UAFW as the difference between the amount of water that they produce or purchase versus the amount that they sell or are able to account for within their systems. UAFW is usually expressed as a percentage.

Surprisingly, across the U.S the water industry seems to accept an UAFW loss of 10–12 percent as normal. Unfortunately, UAFW of greater than 30 percent is not uncommon. As water resources become more limited throughout the U.S., we must emphasis reducing UAFW volumes. Besides conserving precious water resources, low UAFW also indicates a well-managed operation.

The example on the following page illustrates how to calculate UAFW. This example looks at a 30-day cycle. Thirty days is not long enough for a legitimate study, but that amount of time effectively illustrates how most systems calculate UAFW:

Here, the water system cannot account for almost 20 percent of the water it produced in the 30-day period. If the cost of production for each 1,000 gallons is $2.25, then this system spends about $10,000 to produce 4,445,248 gallons of UAFW. In addition, the system has no idea who used the water or what it was used for.
Leaks can account for a large portion of UAFW, or they may be a relatively small portion of the problem. Water systems will always have leaks and line loss, but the trick is to keep water loss as low as possible. Leak detection is a chronic chore for water systems. A system may choose to purchase detection equipment and train staff to check for leaks, or they may hire an outside firm to perform a leak detection survey. Some systems use a combination of internal checks and contracting. Both practices have pros and cons.

Leak detection equipment ranges from simple, inexpensive sonoscopes/stethoscopes to mid-priced acoustic amplifiers to expensive leak correlators. All of these require some level of experience and training to obtain consistent results. Water system personnel use sonoscopes/stethoscopes to detect leaks at meters, valves, or hydrants. They are easy to use and require minimal training and experience.

As equipment becomes more complicated, though, workers will need more experience and may require additional training. Also, if a system purchases expensive leak detection equipment that it will not use very often, it is not necessarily money well spent. Most water systems can get by with inexpensive, simple equipment to find leaks at valves, meters, and hydrants, which is a good value for any water system.

Outside leak detection firms rely on experienced staff trained to use sophisticated equipment. Their services are not as easy on the pocket as simple devices, such as sonoscopes or stethoscopes. Some water facilities limit the survey to a portion of the system to reduce the cost. The facility then contracts for another portion of the system in the next budget. After three to four years, the whole system has been surveyed.

Another method of finding water-loss rates uses how much water a system loses per mile of distribution line instead of the UAFW formula. Either method works to find a system’s overall water-loss rates. The real point to remember when calculating water-loss rates is that if a system has high volumes of unaccounted for water, it can negatively affect the system’s physical capacity and financial health.

To be viable, a water system must monitor and manage UAFW. A number of different elements contribute to UAFW, including:

- leaks,
- inaccurate or broken meters,
- unmetered use, and
- errors in the billing process.
Investing in more elaborate, expensive equipment is justified if trained, experienced staff frequently use it. Medium to large water systems purchase leak detection equipment and train their staff to operate it. As these trained individuals gain experience, they produce good results for their systems.

Most small to medium water systems could get a better return on their money if they contracted with an outside firm to conduct a leak detection survey. In addition, small and medium systems can use less sophisticated equipment to locate leaks prior to using an outside firm. Thus, system personnel find and repair easy leaks prior to the arrival of the experts, and save the system a lot of time and money. The experts can then concentrate on more difficult leaks.

Inaccurate or Broken Meters

Meters supply the data that generate revenue for your water and wastewater system. Basically, water meters are the cash registers for the system. If the cash registers are inaccurate or inoperable, the system loses money. Over time, meters age and lose accuracy. Missed volumes tend to occur during periods when the flow through the meter is low.

Every water system should have a written meter calibration and replacement policy. A written policy provides a tool to manage the meters.

Listed here are at least three essentials to a meter calibration/replacement policy:
1. Check and certify production meters and large customer meters on an annual basis. System personnel can either take meters to a testing facility, or they can check them in place. Checking the meter in place is the best option because the testing facility cannot duplicate exact operating conditions in the field.
2. Install production and large customer meters to meet flow requirements, not pressure requirements.
3. Make sure smaller meters are on a written replacement rotation. Meter suppliers can provide an estimate of how long a meter is expected to work accurately. The policy can specify that the meter should be replaced after a certain number of years or after a certain volume of water flows through the meter.

Unmetered Use

Typically, communities have legitimate uses for a portion of water that their water systems produce, and the systems never bill or meter for it. However, systems should record these volumes monthly, even if they only take an educated guess at how much water is used for:
- fighting fires;
- flushing fire-hydrants;
- washing streets; or
- maintaining city parks, pools, or other facilities.

To keep up with how much water is used for these activities, encourage fire departments to provide monthly estimates of their water use. The same policy holds for the public works department. For example, street sweepers could carry portable meters that document water use. Further, meter any facility that uses water and record the reading monthly.

Occasionally, water theft occurs—generally from fire hydrants. The volume the thieves take is difficult to quantify, but the system should make a good faith effort to estimate the amount of water stolen. A spike in the UAFW level could be an indicator of water theft.

Billing-Process Errors

Another culprit that accounts for some UAFW is billing-process errors. Normally, these errors are a very small portion of UAFW. Here are some common errors:
- inaccurate meter reading—either a misread on the old-style dial meter or the meter reader errs as he or she records the reading;
- an incorrect factor is used to calculate the volume used;
- transcription error in the billing system;
- rounding error in the billing process; and
• estimates used are either totally unacceptable or estimates are used too frequently in
the billing process.

Management and Tracking UAFW
A water system must have a management plan in operation so that it can monitor and
reduce UAFW. Various technical publications are available to guide water system personnel in this
process. To monitor water loss, system personnel should:
• walk the system and check for leaks and unmetered use,
• perform a review of all pumping records, billing, and accounted for water,
• review meter histories and calibration records,
• produce and budget for a written meter program,
• determine whether the system needs a leak detection survey,
• clarify how the system will monitor for leaks in the future,
• track UAFW monthly, and
• stay on task, and work on UAFW regularly.

Tracking UAFW can be frustrating especially if a system looks at data over short time spans—
billing and production volumes don’t necessarily coincide. One approach is to use a running 12-
month percentage for UAFW. This method identifies trends and does not falsely skew data. But
remember, tracking UAFW is useless without accurate meters.

How a Small System Reduced UAFW
System A serves a population of less than 500 people and purchases water from neighboring
System B. The master meter at the connection of the two systems was an early 1980s mechanical
meter. System B historically billed volumes 50–76 percent higher than volumes that System
A bills to its customers.

System A:
• did not have a meter change-out program;
• had not performed an active leak detection program; and
• marginally accounted for volumes used in fire protection and other unmetered uses.

With outside assistance, System A reduced its UAFW to the 10–30 percent range. Here’s how:
• It started a meter replacement program. In the first year, System A replaced 15 percent
of the meters within the system. The system targeted these meters because of age and
location.
• System A hired a leak detection company to survey a portion of the system.

• Office personnel found and corrected a rounding error in their billing software.
• System A persuaded the supplying system (B) to replace the old mechanical meter
with a new ultrasonic meter.
• System A’s water manager worked closely with the fire department to obtain reliable esti-
mates of how much water was used in fire protection every month.
• Staff discovered and corrected other unmetered water uses within the system.

For a typical month, the decrease in UAFW has reduced the monthly payment to System B from about
$2,300 to $1,270. System A has also realized a slight increase in revenue from more accurate meter readings in the
replaced meters. System A still has work to do on reducing UAFW. They plan to complete the leak detection
survey of the entire system and to continue the meter replacement program.

UAFW can be a financial drain on any water utility. How large a drain depends upon the system. Utilities
must constantly monitor and maintain their systems and account for water volumes to maintain an acceptable level of
UAFW. Each system must decide whether they want their UAFW drain to be 3/4 or 36
inches in diameter.

For more information about unac-
counted for water, contact Wyatt at MTAS’s
Jackson Office, 605 Airways Boulevard,
Suite 109, Jackson, Tennessee 38301. Or
call him at (731) 423-3710.
To view MTAS’s Web site, visit
www.mtas.utk.edu.
Crisis Communication: Building a Network to Keep Drinking Water Safe

by Michelle Moore
On Tap Associate Editor

From the table Ron Bargiel shared with the Brownsville water plant superintendent, he had a perfect view of the broad Monongahela River. The sun was shining, sparkling off the water outside the plant. Bargiel had just about finished his lunch when one of the plant’s operators called. He had spotted a huge black plume slowly floating toward the plant’s water intake and wanted the two men to come and take a look.

Bargiel said they hurried down to the water’s edge and immediately knew they had a problem. The men shut the intake, took some samples, and determined the goop was probably coal slurry from a barge loading facility upstream. After a little more investigation, they learned that a large amount of slurry had been accidentally dumped into the river.

Rivers are vulnerable to anything that spills into their waters. Oil, gas, toxic chemicals, or, like in this incident, coal slurry can flow from a ruptured tank or overturned railroad car. These spills cause tremendous pollution that kills fish, spoils river ecosystems, and generally contaminates anything they come in contact with. If a spill occurs upstream from a water treatment plant that pulls its supply from the river, it can damage the treatment system as well as contaminate the drinking water.

Water treatment plants along rivers are about as vulnerable as the rivers themselves. But, with a crisis strategy in place, treatment plants can make sure that the contaminated water doesn’t make it into the facility.
Riverfront Plants Are Wide Open to Spills

The Monongahela River—known locally as the “Mon”—flows north from West Virginia into Pennsylvania. In Pittsburgh, the Mon joins the Allegheny River to form the Ohio River. Pennsylvania Department of Environmental Protection Sanitarian Phil Ranieri knew that there were plenty of water treatment systems open to spills along the Mon. In 1994 he came up with a strategy for a communication network that would head off problems before they became disasters for the water plants.

Ranieri and Tom Flynn, western Pennsylvania district manager for the Army Corps of Engineers (ACOE), finalized the plan. Ranieri then met with all of Pennsylvania’s Mon River water plant operators and representatives from the ACOE and from the Cheat River Dam, which is located on a small river that runs into the Mon. This group agreed that a network to alert each other of spills was a good idea. They formed a calling tree and practiced drills to be ready for anything that might appear in their river.

By 1997 the group realized that it didn’t make sense to have just Pennsylvania water systems involved. If something spilled into the river across the border in West Virginia, the network needed to be aware of it. Ranieri invited personnel from West Virginia water systems located on the Mon to join them, unifying the effort from the river’s start to end.

“Our emphasis here is on catching a situation before it can start, isolate it, and protect the consumers for each of the water companies,” Ranieri said. “When West Virginia came on board, we were able to get information about spills, mine drainage, outflows, and stuff coming from West Virginia as well.”

Each member of the group receives written instructions outlining the protocol to follow if anyone notices a spill on the river. Depending on the spill’s severity, the alert is classified as level one, two, or three, with level three being the most damaging. (See Figure at right.) The first caller reports on the location, time, and the nature of the spilled material. Each person in the chain must talk to a live individual at the next plant and not just leave a message if no one answers. And now, since there is more concern about terroristic threats to water systems, the group recently altered the calling procedure to extend both upstream as well as down.

“Everybody has the same calling tree list,” Ranieri said. “The personnel, say at Point Marion Lock and Dam, who first see evidence of a spill, pick up the phone and call both the next stop downstream and the plant upstream from them. They say that they just saw a suspicious fish kill on the river and to please be aware that this is an actual event, not a drill. That person, in turn, picks up and calls the next on the list, just like dominoes, following all the way up and downstream.”

The person initiating the network alert also must call the county emergency management agency and the dis-
strict environmental protection office so they can take samples and notify other appropriate agencies about what’s happening. Ron Bargiel found himself in this position when that coal slurry came drifting down the river. The former chairman of the network’s board of directors and a water quality superintendent with Pennsylvania American Water Company, Bargiel knew exactly what he had to do. He alerted the next system downstream and called the officials from local agencies who needed to be aware of the situation.

Part of the reasoning behind setting up the network was to make sure that water plants would have time to either change their treatment processes if that was all they would need to do, or they could shut off their intakes entirely if it was a more serious incident.

“We found from our drills that it takes about an hour to call all the systems in the network from the furthest point upstream to the furthest point downstream,” Ranieri said. “The river doesn’t flow that fast so the warning time is ample for everybody to be alerted. Then they either close off their valves or monitor what they can with their lab equipment.”

Emergency management agencies also contribute their services to the crisis communication network. Ranieri said each county rotates on the network’s management board so there is always one representative from the agency partnering with the network. If a tanker or a railroad car upsets, creating a spill that is not on the river itself but close enough to a stream or the river to cause problems, the county emergency management office closest to the spill activates the network. Within a short time, everybody in the network will know that a railroad car full of a potentially hazardous substance has overturned and might eventually make its way to the river. Operators at the water plants can then take steps to protect their systems.

**Shared Information Helps Spread the Word**

The manager of each water system in the communication network must fill out an information sheet that includes names, addresses, phone numbers, operating hours, chemical feeds for the system, and the plant’s lab capabilities. All the systems in the network get a packet showing everyone else’s information.

“This information is crucial in the case of a real emergency where each system is fighting a common calamity,” Ranieri said. “A spill can happen any time, day or night. If you know that one plant is shut down, and
On Tap. Fall 2002.

39

the spill is going to pass them by, you can skip on to the next open system that would be affected.”

This means that a plant that doesn’t draw water from the river after 5 p.m. isn’t going to have to worry about their customers if a spill occurs at midnight. The contaminant will have passed them by before start-up time the next day.

In addition to the basics such as phone numbers and operating hours on these forms, the treatment process information proves to be equally useful. For instance, if the majority of the plants are treating with potassium permanganate, one plant can help another.

“Say I’m working at plant A. I’m running low on my supply, and we’ve got a real emergency here,” Ranieri said. “I can’t just call and order more because it wouldn’t get here in time. Instead, I’ll look through my list and see this guy over here at plant D also is using permanganate. I can pick up the phone and say, ‘Hey, do you have an extra drum of permanganate? Can you spare it? We’re running out.’ Later, when plant A gets their order refilled, they’ll say ‘Here’s the drum you loaned us. Thanks for the help.’ It gets everybody along the same lines and cooperating through a sticky situation.”

Ranieri says they’ve still got a “few little bugs that have to be worked out” with the network. Personnel or phone number changes or changes in plant operation times need to be broadcast to the other members of the network as soon as they happen. All of the employees at each water system who might have to be involved in a crisis are trained to be aware of the protocol of the network. Members also perform quarterly mock drills to make sure the staff at each plant knows what to do if and when a real emergency arises.

“It’s a volunteer network,” Ranieri said. “We can’t force anyone to be in it. But we highly encourage them to. Because, as we tell them, if you don’t get a call, and you’re operating when something comes down, you’re putting your customers at risk.”

Bargiel agrees that a communication network is crucial for plant operations and customer safety. “Because of the conditions along the Monongahela River, there are a lot of potential outfalls that are hazardous—steel mills, coal mines, and what have you,” he said. “And because the water industry is one of the few, in fact, the only utility product that consumers ingest, there was a need to supplement what the Department of Environmental Protection and Environmental Protection Agency were doing, something within ourselves that we could manage.”

If you’re interested in learning more about forming your own crisis communication network, contact Phil Ranieri with the Pennsylvania Department of Environmental Protection at (724) 439-7325 or pranieri@state.pa.us. He will come to your area and talk with plant managers or government agencies to help form similar networks on rivers around the country.

Michelle Moore lives near the Mon River and canoes with her husband down various creeks that run into this historic waterway.
Now that the Arsenic Rule has been finalized and the limit set at 10 parts per billion (ppb), water utilities must examine how the rule will affect their future operations.

The Safe Drinking Water Act (SDWA) allows states to grant water system exemptions, which gives them extra time to comply with the revised arsenic maximum contaminant level (MCL) of 10 ppb. Systems of all sizes may be eligible for a three-year extension from the effective date of January 23, 2006. Systems serving fewer than 3,300 people may be eligible for an additional six-year extension.

Systems can establish their exemption eligibility in a number of ways. If the system is economically challenged, it must demonstrate to the state that it is taking steps to generate the money it needs to install treatment or obtain an alternative water source. This may include documentation to prove that the system has applied for necessary funding, or documentation showing its position on the drinking water state revolving fund priority list.

Other mechanisms may be to simply include a note in the exemption application stating that the local governing authority must vote to approve any changes to the utility. There are potentially hundreds of different scenarios that will satisfy this requirement.

However, the utility is not responsible for proving that management or restructuring changes will result in the system returning to compliance. But, any assistance that the system can provide to the state about whether or not the system can obtain compliance through any of following will expedite the process:
  • rate increases,
  • accounting changes,
  • appointment of a state-certified operator,
  • joint operation with another public water system,
  • activities associated with the capacity development strategy,
  • changing the system’s ownership, or
  • consolidation with another public water system.

It is important to remember that states must have primacy for the Variance and Exemption Rule to issue exemption for arsenic. To date, many states do not have primacy for this rule. Utilities should, however, recognize that states may use Administrative Orders in the place of exemptions and require similar criteria to the exemption process.

### Systems are eligible for exemptions if:

1. The system was in operation on February 22, 2002;
2. The system serves a disadvantaged community or is economically challenged;
3. The system cannot use a different water source;
4. The system cannot make management or restructuring changes that will alleviate the problem; or
5. The exemption does not pose an unreasonable risk to human health.

### EPA Conclusions

1. All systems with average arsenic concentrations of less than 35 parts per billion (ppb) are eligible for a three-year exemption, but must be in compliance by January 23, 2009.
2. Systems serving 3,300 people with arsenic concentrations of less than 30 ppb are eligible for a five-year exemption but must be in compliance by January 23, 2011.
3. Systems serving 3,300 people with arsenic concentration of less than 25 ppb are eligible for a seven-year exemption but must be in compliance by January 23, 2013.
4. Systems serving 3,300 people with arsenic concentration of less than 20 ppb are eligible for a nine-year exemption but must be in compliance by January 23, 2015.
5. Systems with an average arsenic concentration of greater than 35 ppb are not eligible for an exemption.

**Adapted with permission from the National Rural Water Association.**
Letter to the Editor

Editor:

I read with interest the article on “How to Flush Distribution Lines” in the summer 2002 On Tap publication. The Pennsylvania Department of Environmental Protection’s (PA DEP) Water Management Program is responsible for monitoring compliance with the Pennsylvania Clean Streams Law, including permitted and unpermitted activities, in addition to investigating pollution incidents that result in environmental degradation.

The provisions of the Clean Streams Law state that the discharge of chlorinated water to a water of the commonwealth, whether it is from a water-main break, pool-cleaning operation, or a water-line flushing activity, is an unpermitted discharge of a polluting substance that has the potential to cause damage to aquatic life. In fact, unpermitted discharges of chlorinated water from line-flushing activities and water-main breaks have caused several significant fish kills in Pennsylvania.

My main worry is obviously the toxicity associated with the chlorine; however, as stated in the referenced article, water released from line-flushing activities will also contain levels of iron and manganese that may be detrimental to aquatic life.

I am concerned that water system personnel need to know what preventive measures they can take so they can minimize or prevent environmental damage from chlorinated water discharges during line-flushing activities. PA DEP has expended significant resources to educate public water suppliers in our region about how water discharges impact aquatic life.

PA DEP developed a guidance document in cooperation with several public water suppliers in our region to help water suppliers prevent or minimize adverse impacts from water main breaks on aquatic life in receiving streams. This guidance states:

1. Overland Flow vs. Direct Discharge—to be implemented based upon site conditions, if possible, to reduce chlorine concentrations in the discharge. Overland flow is the preferred option and should be implemented where feasible.

2. Dechlorination—with Dechlor tablets, ascorbic acid, or sodium bisulfite, placed in the flow in such a way as to provide mixing and contact time for the dechlorination reaction before the water enters a water of the commonwealth.

3. Sanitary Sewer Discharge—if sanitary sewers are available, and the discharge to the sanitary sewer is approved by the receiving sewer authority, the discharge may be directed to the sanitary sewer for disposal at the sewage treatment plant.

Our organization also plans to develop a similar guidance document to address planned line-flushing activities.

I appreciate the opportunity to comment on the above referenced article.

Steve O’Neil, operations section chief in the water management program of the PA DEP’s Southeast Regional Office, and monitoring compliance officer for the Pennsylvania Clean Streams Law.

Mr. O’Neil makes some valid points in his letter. Because of these concerns, drinking water system personnel should contact their local health department or state regulatory agency to make sure they are not violating any state regulatory policy or law before beginning any line-flushing activity.

—The Editor
All of the products listed are free!

Quantities are limited to one each per order. If bulk copies are needed, please call for availability.

If you are interested in a subject not listed here, please call the National Drinking Water Clearinghouse at (800) 624-8301 or (304) 293-4191 and ask to speak with a technical assistance specialist who may be able to locate information for you.

To order these free products:
Please use the product order form on page 46.
General Information

- DWVTPE25 Careers in Water Quality
- DWVTGN20 Clean Ground Water: Virginia’s Endangered Inheritance
- DWBKPNE00 Clean Water Action Plan: Restoring and Protecting America’s Waters
- DWBKGN28 Designing a Water Conservation Program: An Annotated Bibliography of Source Materials
- DWBLGN24 Drinking Water Glossary: A Dictionary of Technical and Legal Terms Related to Drinking Water
- DWBKGN06 Improving the Viability of Existing Small Drinking Water Systems
- DWBRGN02 Lead Ban: Preventing the Use of Lead in Public Water Systems and Plumbing Used for Drinking Water
- DWBLGN19 Lead in Drinking Water: An Annotated List of Publications
- DWBKGN36 Outreach Resource Guide 2002
- DWBLGN41 Providing Solutions for a Better Tomorrow: A Progress Report on U.S. EPA’s Drinking Water Treatment Technology Demonstrations in Ecuador, Mexico and China
- DWBRGN03 Public Water Systems: Providing Our Nation’s Drinking Water
- DWBKRE03 Summary Report: Small Community Water and Wastewater Treatment
- DWBKGN20 Technical & Economic Capacity of States & Public Water Systems To Implement Drinking Water Regulations
- DWBLRE02 USDA Rural Utilities Service Water 2000: A Plan for Action
- DWBLGN35 Water 2000 Information Package
- DWBLGN17 Water Quality Self-Help Checklist

Management

- DWBKG56 Disinfection Profiling and Benchmarking Guidance Manual
- DWBKG09 Drinking Water Handbook for Public Officials
- DWBLMG20 Ensuring Safe Drinking Water for Tribes
- DWBKG14 Environmental Planning for Small Communities: A Guide for Local Decision Makers
- DWBKG54 EPA Water Conservation Plan Guidelines
- DWBKG10 Ground Water Resource Assessment
- DWBLMG12 Helping Small Systems Comply With The Safe Drinking Water Act: The Role of Restructuring

NDWC Publications

- DWQUNL01 OnTap, Volume 1, Issue 1; Spring 2001
- DWQUNL02 OnTap, Volume 1, Issue 2; Summer 2001
- DWQUNL03 OnTap, Volume 1, Issue 3; Fall 2001
- DWQUNL04 OnTap, Volume 1, Issue 4; Winter 2002
- DWQUNL05 OnTap, Volume 2, Issue 1; Spring 2002
- DWQUNL06 OnTap, Volume 2, Issue 2; Summer 2002
- DWQUNL07 OnTap, Volume 2, Issue 3; Fall 2002

Operation and Maintenance

- DWBKDM23 Alternative Disinfectants and Oxidants Guidance Manual
- DWBKOM17 Arsenic Removal from Drinking Water by Coagulation/Filtration and Lime Softening Plants
- DWBKOM12 Arsenic Removal from Drinking Water by Ion Exchange and Activated Alumina Plants
- DWBKOM14 Arsenic Removal from Drinking Water by Iron Removal Plants
- DWBKOM03 Control of Biofilm Growth in Drinking Water Distribution Systems
- DWBKOM16 Controlling Disinfection By-Products and Microbial Contaminants in Drinking Water
- DWBLRE01 Impact of Pipe Coatings on Drinking Water Quality
- DWFSOM10 Interim Enhanced Surface Water Treatment Rule: A Quick Reference Guide
- DWSTR16 Leak Audit Software for Water Utilities to Quantify Distribution System Water Losses
- DWBKOM09 Optimizing Water Treatment Plant Performance Using the Composite Correction Program: 1998 Edition
- DWFSOM13 Oxidation of Arsenic (III) by Aeration and Storage
- DWFSOM19 Safety Tips: Hazard Communications
- DWBKRE11 Seminar Publication: Control of Lead and Copper in Drinking Water
- DWBLMG05 Water Board Bible: The Handbook of Modern Water Utility Management
- DWBKM03 Water System Self-Assessment for Homeowners’ Associations
- DWBKM02 Water System Self-Assessment for Mobile Home Parks
To place an order...

To place an order, call the NDWC at (800) 624-8301 or (304) 293-4191, or use the order form on page 46 and fax your request to (304) 293-3161. You also may send e-mail to ndwc_orders@mail.nesc.wvu.edu. Be prepared to give the item number and title of the product you wish to order.

The NDWC's Products Catalog provides descriptions of many products. The guide may be downloaded via the NDWC's Web site at www.ndwc.wvu.edu.

Please indicate the product item number, title, and quantity for each item ordered. Make sure you include your name, affiliation, address, and phone number with each order.

Quantities are limited to one each per order. If bulk copies are needed, please call for availability.
To Order NDWC Products:

- **Call:** (800) 624-8301 or (304) 293-4191
- **Fax:** (304) 293-3161
- **E-mail:** ndwc_orders@mail.nesc.wvu.edu
- **Mail:**
  National Drinking Water Clearinghouse
  West Virginia University
  P.O. Box 6064
  Morgantown, WV 26506-6064

### Ordering Products

Please indicate the product item number, title, and quantity for each item ordered. Make sure you include your name, affiliation, address, and phone number with each order.

### Mailing Information (Please Print)

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organization/Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Telephone Number</th>
<th>Fax Number</th>
<th>E-mail Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NDWC’s Web Site

Log on to the National Drinking Water Clearinghouse web site at [www.ndwc.wvu.edu](http://www.ndwc.wvu.edu)

### Organization/Affiliation

- Consultant/Engineer
- Contractor/Developer
- Educational Institution
- Federal Agency
- Indian Tribe
- International Agency
- Local Government
- Manufacturer
- National Organization
- Regional Organization
- Operator
- Press/Media
- Private Citizen
- State Agency
- State Organization

### Your Interest/Expertise

- Conservation
- Design
- Enforcement/Compliance
- Finance
- Health
- Operation and Maintenance
- Outreach
- Planning/Management
- Public Education
- Regulations
- Research
- Technology
- Training

---

*Please allow two to four weeks for delivery.*
ASDWA Offers Self-Assessment Guide

Security is a continual process of reviewing and improving ways to protect our communities’ water systems. The Association of State Drinking Water Administrators (ASDWA) created a guide to help systems serving fewer than 3,300 people assess their facilities and identify needed security measures. The guide includes an emergency contact list and a phone threat identification checklist.

The Security Vulnerability Self-Assessment Guide is available on ASDWA’s Web site at www.asdwa.org in both Microsoft Word and pdf formats. You also may request the guide by writing to them at 1025 Connecticut Avenue, NW, Suite 903, Washington, D.C. 20036, or calling (202) 293-7655.

Water Treatment Critical to Address Poverty

A group of leading scientists and politicians say that unless access to clean water is radically improved, efforts to cut the number of people living in poverty in half by 2015 will fail.

The United Nations Environment Program estimates that 2.2 million people die each year from diseases such as cholera and dysentery that contaminate drinking water. Clean drinking water’s importance has been stressed many times throughout the world, but other demands for water, such as irrigation and sanitation, has been gaining attention away from drinking water programs.

In many cities across Africa, plumbing is so outdated and the infrastructure is so weak that 40 to 60 percent of water may leak away. During its millennial declaration, the United Nations set 2015 as the target date to cut the number of people living in poverty by half.

U.S. to Spend $970 Million for Global Safe Water Programs

The U.S. and Japan recently announced a joint initiative to cut the number of people who lack safe drinking water by half by 2015. The U.S. will spend more than $970 million over the next three years as part of the initiative, the Kyodo News reported.

Water experts from both countries will work together to bring water to underserved populations. As a first step in the joint venture, water professionals from both countries will participate in the World Water Forum in March 2003 in Japan.

Fun Time Puzzle Solutions

Drinking Water Trivia

ANSWERS
1. Salt
2. Watercolor
3. Water mains
4. Whooping crane
5. Delta
6. Divining crane
7. H2O
8. Sulfur
9. Muddy Waters
10. Yes
11. Runoff
NDWC Crossword Puzzle

Across

1. Missing H₂O (with 66 across)  6. Dorothy's dog
10. Wanes  14. Delete
15. ___ the Terrible  16. Elm or Maple
17. Land at the mouth of a river  18. Cat's remark
19. Employ  20. Pay
23. Small legume  24. 17th Greek letter
25. Short film about current events  30. Lowest part
34. Eggs  35. Tossed vegetable dish
36. French cat's remark  38. Immense
40. Nude  42. Capable
43. Invalidate  45. At no time
47. Spanish cheer  48. Animal in heat
49. Me, _____, and I

Down

1. Marry  31. Forbidden
2. Exist  32. Greeting (var.)
3. Soft mineral  33. Velvety
4. Bars legally  36. Transylvanian city
5. Hole-making tools  39. Good employee relations minimizes this
6. Occasion  41. Discourage
7. Kitchen appliance  44. Hawaiian feast
8. New Mexico artist's haven  46. Weave again
9. Ahead  49. Me, _____, and I
10. Country formerly known as Abyssinia  51. Rouse
11. Panache  54. He and she
12. Capital of Switzerland  55. Hoar
13. Perceive  56. Rucksack for bikers
21. Encomium  57. Civil rights figure ____ Parks
22. Not us  58. Attention-getting sound
25. Stars  59. Tolerable
26. Roy Roger's partner Dale ____  60. That woman
27. Was not (abbr.)  63. Sign of agreement
28. Ardor  64. Before to poets
29. Made a lake?
compensation
worker
employer
employee
utility
insurance
certification
managers
turnover
business
municipal
interview
micro-manage
benefit
engineer
operator

hydrologist
distribution
biofilm
oversize
detention
contaminant
design
biological
chemical

1. Which is heavier, salt or fresh water?
2. What word describes a painting made from pigments mixed with water?
3. What is the name of the large pipes used to supply water to homes or industries in a city?
4. The Platte River Valley is part of the migratory route of what endangered bird?
5. The deposit of sediment that builds up at the mouth of a river is known as what?
6. Some people claim to use a forked stick to find groundwater. What is the name of this stick?
7. What is the chemical symbol for water?
8. What common chemical is found in acid rain?
9. What famous blues artist had water for a last name?
10. Are the oceans connected?
11. What flows across the ground and into streams is known as what?

Answers are on page 47.

Questions provided by The Groundwater Foundation educational game “Dripial Pursuit.” The game is available from the foundation for $6.50 plus tax, shipping, and handling. Orders can be placed online at www.groundwaterfoundation.org/Catalog/Cat_dripial.htm or by calling (800) 858-4844.
Is safe drinking water heading toward disaster?

By Kathy Jesperson
On Tap Managing Editor

Getting a simple answer to whether safe drinking water will always be available won’t be easy. In a country where people are used to having inexpensive, safe drinking water from just about every faucet, the thought that it may not continue seems ludicrous. No matter how absurd that thought may appear right now, finding the money to replace, restore, or repair the nation’s crumbling infrastructure may make the notion a reality.

“Across the country, long-neglected mains and pipes, many a century old, are reaching the end of their life span,” noted an August 12, 2002, U.S. News & World Report article, “The Coming Water Crisis.” Replacing disintegrating pipes will take vast resources. And the likelihood of finding those resources now—let alone in the future—may be one of the biggest challenges we will ever face.

Funding Needs Are Critical

In September 2002, the U.S. Environmental Protection Agency (EPA) released a report titled, “The Clean Water and Drinking Water Infrastructure Gap.” The report observed that wastewater treatment capital spending and maintenance needs will exceed current spending levels by $270 billion through 2019, while demands for improved drinking water treatment facilities will exceed current spending by more than $265 billion over the same period.

“Municipal and regional governments, which finance 90 percent of water treatment systems, will have to boost spending by 3 percent a year over the rate of inflation to avert the massive projected spending gap,” according to the Washington Post.

“Over the past two decades, communities have spent $1 trillion on drinking water treatment and supply and wastewater treatment and disposal. While this spending has been substantial, it may not be sufficient to keep pace with an expanding and geographically shifting population.”

Recently, the federal government has spent more than $19.7 billion for wastewater treatment projects and $3.6 billion for drinking water programs.

“The magnitude of the challenge America faces is clearly beyond the ability of any one entity to address,” EPA Administrator Christine Todd Whitman said in the Post article, “It will require the participation and contribution of government at all levels, utilities and users.”

Spending on security-related activities also has eaten away at an already tight budget. According to an October 9, 2002, WaterTechOnline article, “The war on terrorism and the economy have interrupted the nation’s goal of making rivers and lakes safer for drinking and recreation.”

In a recent speech at the Environmental Council of the States conference, EPA’s Whitman told attendees that brains would have to overcome bucks. “We have to be smart about leveraging resources—not just the financial resources but also the intellectual resources. And we need to understand that that means a partnership between the federal government, the states, the tribes, the non-profits, and the private sector.”

Whitman also told the attendees that water quality and quantity are among the top issues of the century. But she also said that while it’s EPA’s responsibility to protect the public’s health and the environment, all of the answers to the financial and pollution problems that we face don’t lie in Washington.

Further, she said that the public expects results from the agency. “They want to know that everything that we are doing is actually working to enhance the environment for themselves and their children. And they don’t care about how tough the times are financially or otherwise today.”

What can small systems do?

Small water system personnel need to take the initiative to get things rolling in their local communities. To begin, small systems need to let community members know what needs to be done to improve the local water system and ask the community for help in developing action plans. Being as open as possible with the community’s residents can help build support for your system.

“Learning to do more with less” may soon be every drinking water system’s motto—whether we like it or not. But it’s not impossible. Develop contingency plans so that when Murphy’s Law comes into play, you’ll be ready. Take every opportunity to educate yourself and learn how to do it yourself. Someday soon, we may not have a choice.

If you have a successful self-help story, please let On Tap editor Kathy Jesperson know about it. You may call her at (800) 624-8301 or e-mail her at Kathy.Jesperson@mail.wvu.edu

Kathy Jesperson is the managing editor of this issue of On Tap. As a part of her own self-help program, she tries hard never to miss an episode of the Simpsons.
We’re a friendly bunch!

The National Drinking Water Clearinghouse (NDWC) is a nonprofit organization funded through the U.S. Department of Agriculture’s Rural Utility Service. Our mission is to help small towns and rural areas have the best drinking water possible. We have information available to make it easier for you to achieve that goal.

We maintain a toll-free technical assistance hotline, produce On Tap magazine, and distribute many other free educational materials. We also sponsor conferences, workshops, and seminars.

The NDWC houses several databases, including a comprehensive small system treatment technologies database called RESULTS, which can be searched by request at no charge.

To learn more about the NDWC, you can order an information package or speak with a member of our staff by calling (800) 624-8301. Or, you can visit our Web site at: www.ndwc.wvu.edu.
The National Environmental Services Center (NESC) provides technical assistance and information about drinking water, wastewater, and environmental training to communities with fewer than 10,000 residents. You may be familiar with our individual programs, each well established as a national leader in its areas of expertise.

National Small Flows Clearinghouse (NSFC), a national information and assistance program, helps small communities identify appropriate wastewater technologies. NSFC offers more than 450 free or low-cost products, including posters and brochures; Small Flows Quarterly magazine with nearly 45,000 subscribers; and Pipeline, a newsletter for the public with approximately 20,000 subscribers. NSFC maintains five databases with bibliographic, manufacturers and consultants, state regulations, and facilities information. NSFC annually hosts a conference for state regulators. Visit their Web site at www.nsfc.wvu.edu.

National Drinking Water Clearinghouse (NDWC) services include a toll-free technical assistance hotline; On Tap, a quarterly magazine that combines the NDWC’s former newsletters On Tap and Water Sense into a single publication with approximately 23,000 subscribers; more than 250 free products; a literature database, and RESULTS [Registry of Equipment Suppliers of Treatment Technologies for Small Systems] database. The Web address is www.ndwc.wvu.edu.

National Environmental Training Center for Small Communities (NETCSC) services include E-Train, a quarterly newsletter with approximately 7,000 subscribers; five databases, providing information about environmental training activities; and many free and low-cost products, including the Environmental Training Resources Catalog. NETCSC helped develop 40 training curricula and hosts an annual, national environmental training institute. Find them at www.netc.wvu.edu.

National Onsite Demonstration Program (NODP) encourages the use of alternative, decentralized wastewater treatment technologies in small and rural communities. NODP helps communities fund, install, monitor, and manage model wastewater treatment systems as cost-effective alternatives to centralized sewage systems. Visit their Web site at www.nodp.wvu.edu.

Located in Morgantown, West Virginia, NESC is based at one of the nation’s major doctoral-granting research institutions, West Virginia University.

(800) 624-8301 • (304) 293-4191 • www.nesc.wvu.edu

National Drinking Water Clearinghouse
West Virginia University Research Corporation
West Virginia University
P.O. Box 6064
Morgantown, WV 26506-6064

CHANGE SERVICE REQUESTED