Mountain State Water Line

A Publication of the West Virginia Rural Water Association

Summer 2024

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- Bottled Water vs. Tap Water
- The Source Water Protection Area

West Virginia Rural Water Association

Summer 2024

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West Virginia Rural Water Association, WVRWA, is a non-profit organization of rural and small publicly owned water and wastewater systems. The vision of the WVRWA is to be the recognized leader and respected voice for water and wastewater systems. The mission or purpose of WVRWA is to provide and promote the highest level of utility service, technical assistance, training, and advocacy for all West Virginia water and wastewater systems.

WVRWA is affiliated with the National Rural Water Association.

Online Training Classes

WVRWA has teamed up with SunCoast Learning Systems, Inc. to bring online computer-based water and wastewater training to operators throughout the state. Through WVRWA Online Learning, you now have the freedom to learn from home, the office, or your local library. Training can be accessed directly from your personal computer using your internet connection.

Water and wastewater operators registering for e-Learning courses will have a menu of courses from which to choose. We are constantly adding and updating courseware to reflect changing industry needs and regulations. For more information, you can visit www.wvrwa.org or contact the office at 800-339-4513. Some of the available courses are shown below.

Course	CEH Hours	Approved for	Price
Drinking Water Mathematics	10	Water/WW	$180
Surface Water Treatment	10	Water	$180
Basic Environmental Chemistry	10	Water/WW	$180
Small Water Systems I	5	Water	$100
Chlorinator Systems & Chemical Handling	10	Water/WW	$180
Water Transmission and Distribution	10	Water	$180
Practical Personnel Management	7	Water/WW	$125
Water Utility Calculations	10	Water	$180
Pumps & Motor Maintenance	10	Water/WW	$180

By Jim Johnson, Wastewater Technician

Collection System Operation and Maintenance

Over time, our sewer systems begin to age. As this aging occurs, things like blockages, deterioration and line collapses begin to take place. Wastewater systems need to take major steps to improve the performance of their sewer systems. Actions like cleaning and inspecting sewer lines need to be scheduled on a regular basis. These actions will help maintain the system's investment in the sewer system for a long time.

To determine the condition of a sewer line, inspect the sewer line with a sewer camera. Other options for inspecting a sewer line include Closed Circuit television, visual inspection or lamping. When you inspect your sewer lines, document your findings. It is important that when you find an issue, you make the repair. Doing a visual inspection will help you to fully understand the condition of a sewer line. Pay close attention to areas where water is laying on the ground or road and note spots above sewer lines where the ground is sunken. These are signs of potential pipe leaks and they need to be checked out. If doing a visual inspection, check some manholes and look at the condition. Check the manholes in wet and dry weather conditions to see if you may have I&I. Look for water coming in and breaks and cracks. Repair what you find.

To maintain proper function, a sewer line needs to be cleaned. A lot of proactive systems put their sewer lines on a cleaning schedule. The employees will get to know the system as to how often each line needs cleaned. Some lines may need to be scheduled every couple of months. Other sewer lines may only need to be cleaned every couple of years. If a sewer line keeps giving you problems, clean it more often. Most systems use a sewer jetter or vac-truck to clean their sewer lines. Make sure to dispose of the debris you remove from the sewer pipes in a proper, legal manner. Flush the lines as needed. Try to take your time and clean it as well as possible. This will cut down on the number of times it will need to be cleaned.

After the inspection, a sewer pipe rehabilitation plan should be developed and implemented. The pipe rehabilitation should be prioritized by doing the pipes that have the most urgent need of repair first. Sometimes, you will be able to get away with just replacing a section of pipe. At other times, you will need to replace all of the sewer pipe in a particular area. Sometimes, you may be able to just take the pipe out and replace it. There could be times that there is a major issue and the replacement will need to be engineered.

One of the key components to keeping up with the system's inspection, cleaning and rehabilitation plans is to have the proper staff. The system will need an operator well trained in pipe cleaning and rehabilitation and this operator will need the proper number of staff to get the lines inspected, cleaned and rehabilitated. This is not a part of the job at a wastewater system that should be done "if we have time." This should be part of the everyday job plan and should be on the schedule to do. Normal maintenance on the collection system will make the system last longer and you will have fewer emergency breakdowns and callouts if you keep your system on a regular maintenance schedule. ■

By Adam Conant, Energy Efficiency Technician

Ways to SAVE with VFDs

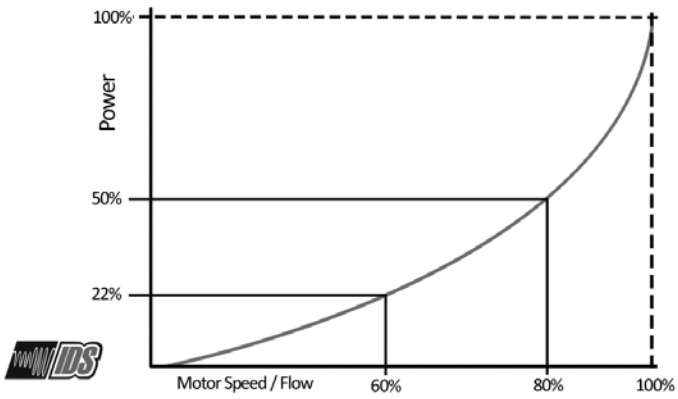
Trying to think of some ways to SAVE money at your water or wastewater treatment plant? Looking for ways to meet the new budget? Have you considered using VFDs where applicable? VFDs could possibly be the answer to help your system reduce its overall electric and maintenance cost. Before you say it won't work, let's take a look at some benefits and ways to save using VFDs. In addition, there needs to be research done and data collected to see if a VFD would be a good fit for your specific application.

First, let's establish a baseline for what is a VFD and how do they work. The actual meaning of the word VFD is Variable Frequency Drive. According to equansmep.com, a "VFD rectifies the incoming alternating current (AC) to direct current (DC) because it's much easier to 'manipulate' DC than AC. Electronic switches (insulated-gate bipolar transistors or IGBTs) capable of turning 'on' and 'off' up to 15 thousand times per second output pulses of direct current of varying duration (pulse-width modulation) in order to replicate a three-phase AC sine wave of the desired voltage amplitude and frequency for controlling motor speed." To put it in lame man terms, a VFD can take AC current and convert to DC current, adjust the speed and then convert it back into AC current.

Now that we have established what VFDs are and how they work, let's take a look at the 4 ways we can save using a VFD.

1. Energy Savings

Simply put, not all motors need to run at full capacity(60Hz) to get the job done. In some applications, the motors can be slowed down and still get the job done. Below is a quick overview on how the VFD works using Cube Law. The following is a graph of slowing the speed of a motor down to 48Hz, which is 50% power reduction, while still maintaining 80% of the pump capacity. The power is proportional to the speed cubed: .8x.8x.8=51% energy consumption. Since it is the power that costs the money, the graph shows what it looks like in practice. And the sums look like this for slowing down a pump by 20%.



2. Reduce Peak Demand

VFDs can help reduce peak demand by helping to control motor inrush. Motor inrushes can be 5 to 11 times higher than the full-load current needing to operate the motor. Peak demand is sometimes called a power charge, a demand charge is measured in kilowatts (kw). This is a measurement of capacity or the rate at which you use energy. Demand represents the greatest amount of energy used in 15-minute intervals during a billing cycle. To measure demand, electric meters record the average demand usage over each 15-minute period and record the highest (peak) period for the month.

Further research needs to be done with each system's electric bill to determine what the peak demand rate is. To know if peak demand can be achieved, the systems have to collect the correct data to be able to measure the savings obtained through the reduction of peak demand.

3. Motor wear

Another benefit that VFDs can bring is to reduce wear on the motor. The way VFDs help to accomplish this is with the option of slow start ups and slow shut downs. Ramp up and ramp down times can be set with a VFD to allow the motor slower startup and stop times, reducing heat and the mo-

tor from slamming on or off. Example: we don't want to drag race the motor, we want to treat it like we are driving onto the interstate on ramp, slowly increasing speed to reach needed speed to safely merge onto the interstate. We don't drive the car at full throttle when we get on the interstate, we maintain a safe needed speed.

4. Financial Incentives

When purchasing and installing VFDs, there can be credits, rebates and tax reduction given by power companies and local governments. Credits and rebates are ways to incentivize the installation of VFDs to help reduce energy, which basically means if VFDs are used correctly and in the right application, we can save electric consumption and reduce the waste of electric. Further research will need to be done to check with your electric company and local governments to determine what the options are for credits and rebates for your system.

In summary of Ways to Save with VFDs, we need to look at every option we have with using VFDs to save energy and become more efficient. With the rising cost to replace equipment, we need to do everything we can do to conserve electric to help extend equipment life. If we use VFDs properly in the correct application, we could see a reduction in our system's overall budget, giving extra funds to allocate to areas in need.

Site sources

Equansmep (5 Reasons to Install Energy – Saving VFD's), July 17, 2018,5 Reasons to Install Energy-Saving VFD s MEP Services (equansmep.com)

Goemc (Pros and Cons of Using a VFD)JOHN GULDNER, FEBRUARY 4, 2021, Pros and Cons of Using a VFD (goemc.com)

InverterDriveSystemLTD,(Cube Law Explained) 2024, https://www.inverterdrivesystems.com/cube-law/ ■

By Bertis M. McCarty, Water Circuit Rider

Leak Detection with Meters, Pressure and Telemetry

New technological advancements have brought about different ways to find water loss in the distribution system.

METERS

Some meters now can do a job that is very similar to what a correlator does. They work 24 hours per day listening for the sound a leak puts out and report back to the system owner through e-mail or text. The following is a quote from one of those meter manufacturers that I like. "Based on an advanced algorithm, the system identifies the meters with the highest risk of leakage so that you can spend your time verifying and fixing leaks rather than searching blindly to find them." These meters are also radio-read and have advanced low-flow reading capabilities. If your system is still reading meters by hand or they have an older radio read system, it might be a good time to look at this new technology. Maybe your system has a large water loss and the Return-On-Investment would be easy to calculate payback for the new purchase.

PRESSURE

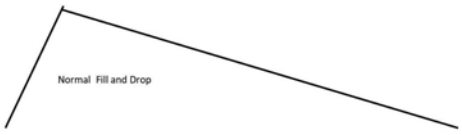
The one pressure recording option familiar to most systems is the optional feature on fire hydrants these days. Sometimes, not understanding how this works keeps systems from purchasing it. Whether you know it or not, your water system is separated into pressure zones. In WV, we have plenty of hills and valleys to change pressures in the water system. Sometimes, they have Pressure Relief Valves (PRV) to reduce pressure in an area that reduces altitude or goes downhill. If a person has one fire hydrant in each pressure zone it can help with leak detection. The hydrant can report back to the owner through an e-mail when the pressure exceeds the percentage drop set by them. They also graph pressures over time to see if a slow drop in pressure is trending in an area of concern.

Another way to use pressure is to keep track of the pressure gauges on each side of all the system PRVs. They will change when a leak or problem is near the PRV. If a leak is below a PRV, the sound will be so loud sometimes you can hear it from your vehicle with the window down. These sounds and pressures from a PRV can help a system if it uses them.

There are also pressure recorders that are made to communicate back to the system personnel by Bluetooth or Cell Service. They can be used the same as the fire hydrants to track pressures all the time and report back any changes.

TELEMETRY

Telemetry graphs are one of the most important ways to find leaks in a water system. You can see if a tank is cycling faster than normal (filling up and dropping off). It can show a tank filling up slower than normal, which can be a leak or a pump problem. The below graphs might help with some issues caught by the telemetry in your system.



The Normal and Problem graphs can take about the same time to create one cycle so counting the cycles does not always work. Sometimes, it does help to count cycles per day, but not always.

Using any technology to your advantage can help reduce water loss.NOT using the same technology just "costs money" for the system and ratepayers.

There are many systems in my area using the tools they have with single-digit water loss percentages. I would love to see more systems in the state follow suit. ■

By Beth Fletcher, Wastewater Technician

2022 Clean Watersheds Needs Survey Data

Thanks for your participation in the EPA's Clean Watersheds Needs Survey (CWNS) conducted in 2022. The state of West Virginia has made their voices heard! The CWNS compiles data on existing clean water infrastructure and their projected need for future investment to address the water quality objectives of the Clean Water Act (CWA) over the next 20 years. The data collected represents a nationwide picture of clean water infrastructure across four categories – wastewater, stormwater, decentralized wastewater treatment, and nonprofit source control. With your help, we had 100% participation in the survey by states and territories and the largest reported needs ever.

Data included in the CWNS was collected by state coordinators and their teams on a voluntary basis. For each submission, they reported needs ($) and technical data - such as wastewater or stormwater flow, population served, discharge type, and effluent treatment level. The 2022 CWNS is the 17th survey since the CWA was enacted in 1972 and is required by CWA Section 609 and 519(b)(1)(B). It was administered to all states, the District of Columbia, and U.S. Territories (collectively referred to as "states") over a 14-month period from March 1, 2022, through May 3, 2023. As directed by Congress under the Infrastructure Investments and Jobs Act, the EPA collected projects and associated capital costs (also known as "needs") for all projects eligible for Clean Water State Revolving Fund loans.

Information from the CWNS showed West Virginia had the SECOND HIGHEST needs per capita ($6,182) behind N. Mariana Islands ($7,203)!!! Maryland had $1,725, Pennsylvania had $982, and Ohio had $1,742 per capita. The states with the highest reported needs for communities identified as small were Utah ($5.2 billion), West Virginia ($2.6 billion), New York ($2.3 billion), and Wisconsin ($1.9 billion). These states accounted for about 30 percent of the small community wastewater needs.

The 2022 CWNS data provides a snapshot in time for use by Congress and state legislatures in their budgeting efforts. Your input and the data collected will help ensure that our wonderful state continues to receive federal fundings for programs that provide much needed financial assistance to our communities. Since its inception in 1987, the EPA's Clean Water State Revolving fund has supported over $160 billion in infrastructure and the EPA's Water Infrastructure Finance and Innovation Act (WIFIA) program has issued over $43 billion in financing for water infrastructure projects since 2018.

The data can also be used to help measure environmental progress, contribute to academic research, provide information to the public, and help local and state governments implement water quality programs. The data should not be used for compliance purposes nor be interpreted as a complete accounting of all SRF-eligible needs. Inclusion in the Report to Congress does not suggest that funding from local, state, or federal sources is not available and should not be construed as request for additional federal funding.

All information on the 2022 Report to Congress, summary document, and past surveys can be found on the newly updated CWNS website at https://www.epa.gov/cwns, and a new 2022 Data Dashboard is available at https://cwnsdep.epa.gov/2022dashboard.

Just a couple of highlights...

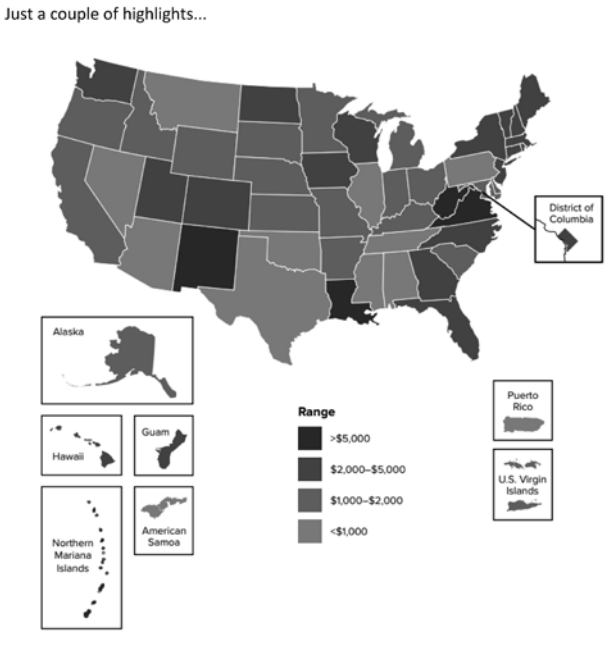


Figure 3. Distribution of Per Capita Reported Needs by State (January 2022 Dollars/Person)

Conveyance System Repair (Category III) and New Conveyance Systems (Category IV)

Highlights

- Category definitions: The capital costs to rehabilitate and replace existing conveyance systems and install new ones.
- Total needs: $151.1 billion.
- Change in total needs from 2012: Increase of 27 percent ($32.4 billion).
- Number of states reporting needs: 55.
- States with the highest reported needs: New York ($18.9 billion), California ($15.0 billion), Florida ($10.6 billion), Ohio ($9.8 billion), and North Carolina ($7.3 billion).
- States with the largest per capita needs: Northern Mariana Islands ($5,147), District of Columbia ($1,932), Virgin Islands ($1,681), Hawaii ($1,448), and West Virginia ($1,266).

Combined Sewer Overflow Correction (Category V)

Highlights

- Category definition: The capital costs to prevent or control the periodic discharges of mixed stormwater and untreated wastewater that occur when the capacity of a sewer system is exceeded during a wet weather event.
- Total needs: $36.5 billion.
- Change in total needs from 2012: Decrease of 39 percent ($23.0 billion).
- Number of states reporting needs: 35.
- States with the highest reported needs: New York ($6.0 billion), Pennsylvania ($4.4 billion), New Jersey ($3.6 billion), Connecticut ($2.9 billion), and Indiana ($2.9 billion).
- States with the largest per capita needs: West Virginia ($922), Connecticut ($817), District of Columbia ($575), Rhode Island ($534), and Indiana ($431).

Nonpoint Source Control (Category VII)

Highlights

- Category definition: The capital costs to manage and/or treat NPS pollution, which is any source of water pollution that does not meet the legal definition of "point source," per CWA section 502(14). NPS pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification.
- Total needs: $94.4 billion.
- Change in total needs from 2012: Not reported in 2012.
- Number of states reporting needs: 50.
- States with the highest reported needs: Louisiana ($22.0 billion), California ($9.2 billion), New Mexico ($7.1 billion), Colorado ($4.9 billion), and West Virginia ($4.8 billion). ■

By Daniel Vestal, ARC Specialist

Suggested Checklist for Public Water Supply System Operation & Maintenance Manual

- Map of all source/intakes and raw water transmission lines to plant(s)
- Map of current finished water distribution system
- Inventory List of property, service lines, equipment, tools and instruments; include manufacturer, model, serial number, and condition
- Locations of spare parts (including pumps and backup power source) and vendor contact information or repair service used
- O&M technical manuals for equipment and water system facilities (e.g. treatment plant, distribution system)
- Lists of daily, weekly, monthly, quarterly, and/or annual maintenance tasks to be performed. Log sheets for recording maintenance performed.
- Location of first-aid instructions and supplies.
- Contact names, telephone/fax numbers and email addresses for:
  - System operators, including contract support;
  - System owners or local government officials;
  - EPA Region 8;
  - WY DEQ District Office/ Tribal Environmental Director;
  - State/County Public Health or Indian Health Service/ Bureau of Reclamation;
  - Certified laboratories used, with identification for each type of sample analyzed;
  - Local responders (law enforcement, fire, hazmat)
  - Experienced operators at nearby systems who can serve as backup or provide help in an emergency.
- Monitoring Plan: Current Year EPA monitoring requirements, location of sampling or monitoring sites, sampling/reporting forms, and instructions for reporting and recordkeeping.
- Location of sampling and monitoring records
- Location of other formal communications from/to EPA Region 8 and others on the contact list above
- Locations of spare sample bottles, sampling technique information; monitoring plans
- Instructions when notified by lab of RTCR/fecal positive sample
- Location of public notice forms and instructions
- Instructions for pressure loss in system (flow chart)
- Instructions for flushing and shock chlorinating tanks, wells, distribution system mains, etc.
- Location of secured instructions for maintaining security in your system.
- Take-Away Emergency Response Plan: (1) Flow charts for operators to handle specific problems (main breaks, chlorine leaks, chemical spills); (2) Names and phone/fax numbers of state and local responders (police, fire, hazmat, county, etc.) (3) Names/numbers of county and state agencies to call if waterborne disease outbreak or other health emergency.

Examples of Operation & Maintenance Tasks

Listed below are examples of tasks that might be included in your Operations and Maintenance Manual and instructions to persons involved in servicing your public water supply system. Use these lists only as examples for creating your own lists appropriate to your system.

Examples of **Daily Tasks:**

- Check water meter readings and record water production.
- Check chemical solution tanks and record amounts used.
- Check and record water levels in storage tanks.
- Inspect chemical feed pumps.
- Check and record chlorine residual at the point of application.
- Check and record chlorine

residual in the distribution system.
- Inspect booster pump stations.
- Check and record fluoride concentration in the distribution system.
- Record well pump running times and pump cycle starts.
- Check instrumentation for proper signal input/output. Investigate customer complaints. Record threats or suspicious activity.
- Complete a daily security check.
- Inspect heater operation during winter months.
- Inspect well pumps, motors, and controls.

Examples of **Weekly Tasks:**
- Inspect chlorine and fluoride testing equipment.
- Clean pump house and grounds. Make sure fire hydrants (if any) are accessible.
- Record pumping rate for each well or source water pump.
- Conduct weekly security check.

Examples of **Monthly Tasks:**
- Read electric meter at pump house and record.
- Take appropriate monthly water quality samples.
- Check and record static and pumping levels of each well.
- Read all customer meters and compare against total water produced for the month.
- Inspect well heads.
- Lubricate locks.
- Check on-site readings against lab results.
- Confirm submittal of monthly reports.

Examples of **Annual Tasks:** Possible time-of-year for each task is provided in parentheses.
- Overhaul chemical feed pumps, such as O-rings, check valves, and diaphragms. (first Monday in January)
- Inspect and clean chemical feed lines and solution tanks. (first Monday in January)
- Calibrate chemical feed pumps after overhaul. (first Monday in January)
- Begin Safety Equipment Repair Log. Maintain log continuously throughout the year. (first Monday in January)
- Operate all valves inside the treatment plant and pump house. Maintain log continuously throughout the year. (first Monday in January)
- Review emergency response plans. (first Monday in January)
- Inspect chemical safety equipment and repair or replace as needed. (first Monday in February)
- Operate all valves inside the treatment plant and pump house. (first Monday in February)
- Inspect, clean, and repair control panels in pump house and treatment plant. (first Monday in March)
- Exercise half of all mainline valves. (first Monday in March)
- Inspect and clean chemical feed lines and solution tanks. (first Monday in April)
- Calibrate chemical feed pumps. (first Monday in April)
- Inspect storage tanks for defects and sanitary deficiencies. (first Monday in May)
- Clean storage tanks if necessary. (first Monday in May)
- Flush the distribution system and exercise/check all fire hydrant valves. (first Monday in June)
- Perform preventive maintenance on treatment plant and pump house buildings. (first Monday in June)
- Inspect and clean chemical feed lines and solution tanks. (first Monday in July)
- Calibrate chemical feed pumps. (first Monday in July)
- Prepare a demand forecast. Identify and evaluate energy conservation measures (for your utility). Identify and evaluate distribution system leaks. Establish/update water loss mitigation program. Establish/update customer incentive program for water-efficient home devices. (first Monday in July)
- Operate all valves inside the treatment plant and pump house. (first Monday in August)
- Exercise mainline valves that were not exercised in March. (first Monday in September)
- Prepare system for winter operation. This task may be postponed until October or November, depending on local conditions. (first Monday in September)
- Make sure unnecessary equipment is properly decommissioned. (first Monday in September)
- Inspect and clean chemical feed lines and solution tanks. (first Monday in October)
- Calibrate chemical feed pumps. (first Monday in October)
- Prepare system for winter operation if not completed in September or October. (first Monday in November)
- Contact an electrician to check running amps on well pumps. (first Monday in December)

This Checklist can be found on www.epa.org ■

By Charlie Cooper, Emerging Contaminants Technician

The New Rule for PFAS and What You Need to Know

All systems will have five years to complete sampling and testing. To design a treatment plan and solution. The EPA will not impose any particular type of treatment to Water Systems in this new rule.

Safe drinking water is fundamental to healthy people and thriving communities. President Biden believes that all people in the United States should have access to clean, safe drinking water. Since the beginning of the Biden-Harris Administration, EPA has been delivering on the promise to protect communities from the harmful effects of toxic substances, including carcinogens. PFAS are a series of man-made chemical compounds that persist in the environment for long periods of time. They are often called "forever chemicals." For decades PFAS chemicals have been used in industry and consumer products such as nonstick cookware, waterproof clothing, and stain resistant furniture. These chemicals have been important for certain industries and uses. And the latest science shows that these chemicals are harmful to our health.

PFAS exposure over a long period of time can cause cancer and other serious illnesses that decrease quality of life or result in death. PFAS exposure during critical life stages such as pregnancy or early childhood can also result in adverse health impacts. EPA's responsibility through the Safe Drinking Water Act is to protect people's drinking water, and the Biden-Harris Administration is taking action to protect public health by establishing nationwide, legally enforceable drinking water limits for several well-researched PFAS chemicals and reduce PFAS exposure for approximately 100 million Americans served by public drinking water systems.

As the lead federal agency responsible for protecting America's drinking water, EPA is using the best available science on PFAS to set national standards. PFAS can often be found together in water and in varying combinations as mixtures. Decades of research shows mixtures of different chemicals can have additive health effects, even if the individual chemicals are each present at lower levels.

In this final rule, the EPA is setting limits for five individual PFAS: PFOA, PFOS, PFNA, PFHxS, and HFPO-DA (known as GenX Chemicals). And EPA is also setting a Hazard Index level for two or more of four PFAS as a mixture: PFNA, PFHxS, HFPO-DA, and PFBS.

If you have any questions please contact West Virginia Rual Water for assistance with the new rule. ■

Chemical	Maximum Contaminant Level Goal (MCLG)	Maximum Contaminant Level (MCL)
PFOA	0	4.0 ppt
PFOS	0	4.0 ppt
PFNA	10 ppt	10 ppt
PFHxS	10 ppt	10 ppt
HFPO-DA (GenX chemicals)	10 ppt	10 ppt

By Jamie Nichols, Lead and Copper Program Technician

Lead Service Line Inventory….. is Here to Stay

In July 2023, I got the opportunity to join the great team at WVRWA as a Lead & Copper Program Technician. In that time, I have been able to visit close to 100 water systems throughout this great state we live in and call home. In those visits, I have found 1 common factor with every employee….. FRUSTRATION. Frustration due to the EPA's Lead Service Line Inventory and the stress factor that comes along with it. As a previous Chief Water Operator, I can understand feeling that way. There's a lot of questions out there being asked. One of the most asked is "what happens if we don't do it?" I have even had some to say "we're not doing it, it's going to go away." According to the EPA and West Virginia Department of Health and Human Resources, the Lead Service Line Inventory IS NOT GOING AWAY. This is a living and breathing document that every water system will be required to update every year and re-submit to the State. Whether it be a line replaced by a customer/system, an account number or a new tap. Everything will be required to be updated. So, what does happen if one chooses to not do an Inventory, what are the repercussions?

Per EPA, all "unknown" lines will be considered Lead until identified, therefore, if one does not submit a Inventory by October 16, 2024, every line in their system will be considered Lead. What next? You ask? Per EPA Revision Section **§ 141.85 Public education and supplemental monitoring and mitigation requirements. A water system with lead, galvanized requiring replacement, or lead status unknown service lines must deliver public education materials to persons with a lead, galvanized requiring replacement, or lead status unknown service line.** ***Notification requirements.*** All water systems with lead, galvanized requiring replacement, or lead status unknown service lines in their inventory pursuant to § 141.84(a) must inform all persons served by the water system at the service connection with a lead, galvanized requiring replacement, or lead status unknown service line. Persons served by a lead status unknown service line. **The notice must include** a statement that the person's service line material is unknown but may be lead, an explanation of the health effects of lead that meets the requirements of paragraph (a)(1)(ii) of this section, steps persons at the service connection can take to reduce exposure to lead in drinking water, **and** information about opportunities to verify the material of the service line. **Delivery. The notice must be provided** to persons served by the water system at the service connection with a lead, galvanized requiring replacement, or lead status unknown service line, by mail or by another method approved by the State.

Also, to add, any "unknown" lines CAN NOT be used and a Lead and Copper Sampling Sites:

§ 141.86 Monitoring requirements for lead and copper in tap water.

Sample site location.

The sampling sites for a community water system's sampling pool must consist of single-family structures that are served by a lead service line ("Tier 1 sampling sites"). When multiple-family residences comprise at least 20 percent of the structures served by the water system, the system may include these types of structures in its Tier 1 sampling pool, if served by a lead service line. Sites with lead status unknown service lines must not be used as Tier 1 sampling sites.

A community **water system with insufficient Tier 1** sampling sites must complete its sampling pool with "Tier 2 sampling sites," consisting of buildings, including multiple-family residences that are served by a lead service line. Sites with lead status unknown service lines must not be used as Tier 2 sampling sites.

A community **water system with insufficient Tier 1 and Tier**

2 sampling sites must complete its sampling pool with "Tier 3 sampling sites," consisting of single-family structures that contain **galvanized lines** identified as **being downstream of a lead** service line (LSL) **currently or in the past**, or known to be **downstream of a lead gooseneck, pigtail or connector.** Sites with lead status unknown service lines must not be used as Tier 3 sampling sites.

A community **water system with insufficient Tier 1, Tier 2, and Tier 3** sampling sites must complete its sampling pool with "Tier 4 sampling sites," consisting of single-family structures that contain **copper pipes with lead solder** installed before the effective date of the State's applicable lead ban (July 19, 1989). Sites with lead status unknown service lines must not be used as Tier 4 sampling sites.

A community water system with insufficient Tier 1, Tier 2, Tier 3, and Tier 4 sampling sites must complete its sampling pool with "Tier 5 sampling sites," consisting of single-family structures or buildings, including multiple family residences that are representative of sites throughout the distribution system. For the purpose of this paragraph (a)(7), a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system. Water systems may use non-residential buildings that are representative of sites throughout the distribution system if and only if there are an insufficient number of single-family or multiple family residential Tier 5 sites available.

For any one thinking of not doing an inventory, I strongly advise you to rethink your decision, because when the dust settles and you are having to do all that I previously listed, the system will still be required to verify all the service lines. This information can be found at:

https://www.epa.gov/groundwater-and-drinking-water/revised-lead-and-copper-rule ■

RURAL WATER Loan Fund

About The Program

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The RWLF provides low-cost loans for short-term repair costs, small capital projects, or pre-development costs associated with larger projects. The RWLF was established through a grant from the USDA/RUS, and repaid funds used to replenish the fund and make new loans.

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Reasons to Apply

- Reasonable interest rates
- No administrative or processing fees
- Straightforward application process and quick turnaround
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- Loan amounts may not exceed $200,000 or 75% of the total project cost, whichever is less
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Eligible Projects

- Pre-development (planning) costs for infrastructure projects
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USDA Rural Development

NRWA

National Rural Water Association is an equal opportunity provider and employer. This material is based upon work supported by the Rural Utilities Service, United States Department of Agriculture.

By Cory Weese,Apprenticeship Coordinator

Apprenticeship in Water and Wastewater Treatment: A Pathway to a Rewarding Career

Water and wastewater treatment is a critical process that ensures the provision of clean and safe water for consumption and other essential uses. The field of water and wastewater treatment offers a range of career opportunities, and an apprenticeship in this area can be an excellent pathway to gaining valuable skills and experience.

An apprenticeship in water and wastewater treatment provides individuals with the opportunity to learn the ins and outs of maintaining water quality and ensuring that water treatment facilities operate efficiently. Apprentices work alongside experienced professionals and receive hands-on training in various aspects of water and wastewater treatment, including water testing, treatment processes, equipment maintenance, and regulatory compliance.

One of the key benefits of pursuing an apprenticeship in water and wastewater treatment is the opportunity to earn while learning. Apprentices receive a salary while they gain practical experience and theoretical knowledge in the field. This combination of work and study allows apprentices to develop valuable skills and make meaningful contributions to water and wastewater treatment operations.

Furthermore, an apprenticeship in water and wastewater treatment offers a clear career progression pathway. Upon successful completion of an apprenticeship, individuals can pursue roles such as water and wastewater treatment plant operator, or water and wastewater quality technician. With the increasing focus on environmental sustainability and water conservation, the demand for skilled water and wastewater treatment professionals is expected to grow, providing ample job opportunities for apprenticeship graduates.

In addition to technical skills, apprenticeships in water and wastewater treatment also emphasize the importance of safety and environmental stewardship. Apprentices learn about the regulations and protocols that govern water and wastewater treatment operations, ensuring that they can contribute to maintaining high standards of safety and environmental responsibility in their future roles.

Overall, an apprenticeship in water and wastewater treatment can be an excellent choice for individuals who are passionate about environmental conservation, public health, and working with cutting-edge technology. By embarking on this career pathway, apprentices could make a meaningful impact on their communities by ensuring access to clean and safe water for all.

In conclusion, apprenticeships in water and wastewater treatment offer a valuable opportunity for individuals to gain practical experience, develop essential skills, and build a rewarding career in a field that is vital to public health and environmental sustainability. As the demand for skilled water and wastewater treatment professionals continues to grow, apprenticeship programs play a crucial role in preparing the next generation of talent to address the evolving challenges in water and wastewater treatment. ■

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About the Program

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03 Solid waste collection, disposal, and closure

04 Storm water collection, transmission, and disposal

05 Other related activities such as permits and legal fees

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USDA Rural Development

Scan the QR code to view more information and start your application.

By Shane Altizer, Water Circuit Rider

Bottled Water vs. Tap Water

If you have been around a public water system more than just a few days, you have most likely heard someone say, "I don't drink tap water; I drink bottled water." Maybe you have said something similar, but is drinking bottled water actually better than tap water? This article will inspect three points to determine an answer: Water source, Water Testing, and Cost. We will compare five of the major brands sold at Wal-Mart: Sam's Choice, Pure Life, Aquafina, Dasani, and Deer Park.

Water source

The water source for tap water in West Virginia can be easily determined by the customer looking at the Consumer Confidence Report of the system they purchase from. Streams, lakes, and wells are the main sources for public water systems.

The bottled water sources vary depending on brand, but one thing most people don't realize is that, according to an Environmental Working Group study, nearly 64% of bottled water sold in America is tap water. Sam's Choice water comes from San Bernardino Water District. Aquafina also comes from public water sources, but it doesn't give the exact sources. Pure Life, which is actually Nestle, comes from multiple public water sources mostly in southern California. Dasani comes from multiple municipal water sources as well as a few groundwater sources. Deer Park source is Swift Springs in South Carolina. Four out of five of our bottled water brands come from tap water.

An important thing to note is that these bottling companies filter the water again before bottling to remove the chlorine and, in most cases, the fluoride that the system adds.

Water Testing

Public water systems as well as bottling companies are required to do periodic testing of their water to ensure safety of the product.

Public water systems must follow the EPA standards for testing, while bottled water companies follow the FDA standards. In most cases, the maximum contaminant level (MCL) is the same for both types of water, although there are some differences. PFAS and disinfection biproducts are less stringent in bottled water than tap water, but lead, copper and fluoride are more stringent.

In 2021, John Hopkins University tested 101 different bottles of water and found PFAS up to 16 parts per trillion in 39 bottles, however the EPA standard for public water systems is 4 parts per trillion.

Another concern for bottled water is the amount of microplastics and nanoplastics they contain. A new study done in January of 2024 found that, on average, a liter of bottled water contains 240,000 pieces of plastic. According to the National Institute of Health there are no known health risks for nanoplastics, yet; however, they are a cause of concern.

Cost

Public Water Systems' rates vary depending on the system with the cheapest in West Virgina being $2.00 for 4,500 gallons and the most expensive being $122.63 for 4,500 gallons. For the most expensive water in our state, you will pay approximately 2.7 cents per gallon. The average price is $38.14 for 4,500 gallons or approximately 0.85 cents per gallon.

Bottled water pricing varies as well depending on factors such as location purchased, quantity purchased, and the brand. For this article we will use Wal-Mart as the location, a case of thirty-two or more bottles, and the 5 brands mentioned previously. Sam's Choice water is the cheapest of the five brands at 0.8 cents per ounce, and Aquafina is the most expensive at 3.4 cents per ounce. The average cost of the five types in this article is $2.46 per gallon.

Conclusion

Looking at these three comparisons, do you think drinking only bottled water is the best option? If your system will adhere to the MCL and be mindful of taste and odor while treating, your tap water can be a higher quality product than bottled water. The cost of water is a huge difference. If you have customers complaining about the cost of your water, show the cost comparison of bottled water. Overall, I believe tap water is the better option of the two. ■

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By Jerry Dotson, Sourcewater Specialist

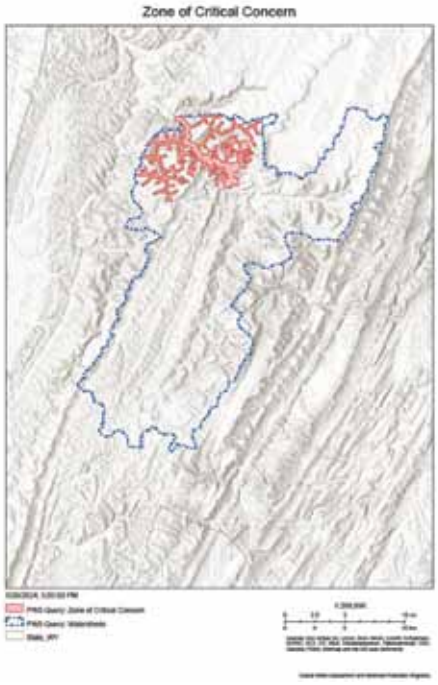
The Source Water Protection Area

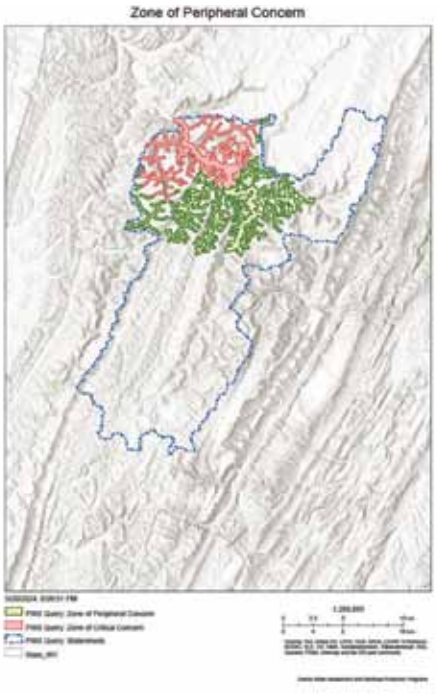
Identifying Potential Sources of Significant Contamination (PSSCs) is an important part of developing a source water protection plan. Potential sources of contamination are the human activities or natural sources that pose a threat of pollution to the drinking water. For the plan to be effective, the PSSCs that pose the greatest risk must be singled out for consideration. So, the plan most often begins by the identification of Source Water Protection Areas (SWPA). This involves mapping out, or delineating, the land area that resupplies the water to the source. Source Water Protection Areas vary in shape and size depending on the land area that recharges the water supply. In West Virginia, sources are used here: surface water, ground water, and ground water influenced surface water.

Surface Water delineations are comprised of three parts. First is the **Watershed**. The watershed consists of the area upstream of the public water system's intake and includes the topographic boundary connecting the highest uphill points from which the water flows to the intake, or as far as the state boundary or the next upstream intake. The watershed is the blue dotted outline in this picture.

The second part of the surface water delineation is the **Zone of Critical Concern** (ZCC). The Zone of Critical Concern is a corridor along the stream, lake, river, or reservoir that requires the closest scrutiny due to the close proximity to the intake. This zone begins one quarter mile below the intake and proceeds upstream to include a five-hour time of travel figured at 90 percent of the maximum flow rate. If maximum flow rate data is not available, a five mile per hour rate is assumed. The zone includes a width of 1000 feet from each bank of the principal waterway and 500 feet from each bank on tributaries. The Zone of Critical Concern is marked in pink in the picture.

The third and final portion of the surface water delineation is the **Zone of Peripheral Concern** (ZPC). This area is an additional corridor proceeding upstream from the ZCC for another five-hour time of travel, creating a ten-hour time of travel collectively with the ZCC and the ZPC. The same dimensions of 1000 feet on each side of the primary stream and 500 feet for tributar-





Source Water Protection Areas are delineated based on the type of water source involved. Three types of

ies are included in this zone. While these zones are prioritized in the order of ZCC, ZPC, and Watershed; all potential contaminants located upstream of the intake are a concern and should be considered. For that reason, a working line of communications should be maintained with all upstream systems. In this picture the Zone of Peripheral Concern is marked in green.

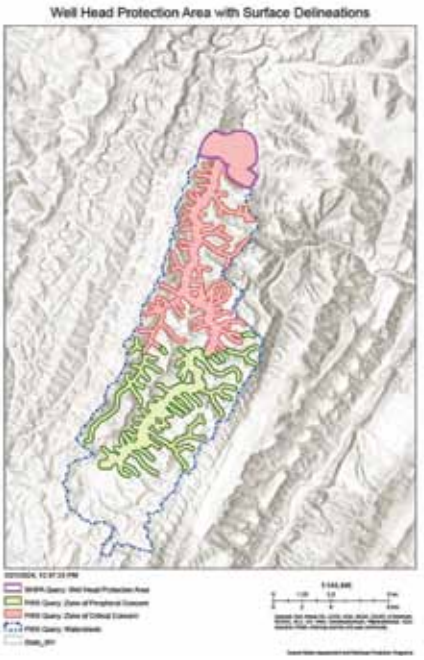
The Source Water Protection Area for a conventional groundwater source (a groundwater source that is not influenced by surface water in any way) is known as a **Well Head Protection Area** (WHPA). There are a number of ways to delineate a Well Head Protection Area. The geological makeup of the soil and the topographic layout of the area around the source have a lot to do with the way the Well Head Protection Area is delineated. The Environmental Engineering Division (EED) of the West Virginia Department of Health utilizes the following delineation criteria to determine what method will be used to delineate Well Head Protection Areas:

Time of Travel (TOT) – the minimum time of travel to be applied to a water supply is five years; however, due to the geological nature of some parts of the state, this can lead to very large protection areas, so flow boundaries may be used as an alternative.

Flow Boundaries – flow boundaries are used to delineate the maximum potential zone of contribution for a well. They identify ground water divides and physical or hydrologic features that control ground water flow to determine the area of influence for a source.

Once the EED has determined what criteria will be used, one of the following methods is then used to calculate the WHPA. The **Fixed-Radius Method** - is a circle of a specific radius drawn around a well or wellfield base on volumetric flow or well pump rate, porosity of the aquifer, and well construction. This method is easy and inexpensive, but is normally only used for small non-community non-transient, and no-community transient sources. **Computer Models** – these are flow models based on a mathematical assumption that the aquifer is a granular porous material. **Analytical Modeling** – this technique solves ground water flow equations through calculus-based mathematics, and generates exact solutions for unknown variables. Analytical modeling is useful when the aquifer materials can be considered similar all around. **Numerical Modeling** – this technique can be used for modeling layered aquifers where the material makeup is dissimilar and is only useful when useful data is available. And **Hydrogeologic Mapping** – which involves determining flow boundaries and designating those boundaries as the Well Head Protection Area. This type of modeling is used in areas where karst terrain exists, like Berkeley and Jefferson counties. Karst terrain consists of rocky ground (limestone) where caves, sinkholes, and underground rivers occur. Karst areas are very vulnerable to contamination because water moves so easily through the ground, so a larger regional delineation is more appropriate.

Ground Water Influenced Surface Water - GWUDIs and SWIGs. GWUDI (Ground Water Under Direct Influence of Surface Water) sources have been around for ages. These are sources where the geological makeup of the soil allows surface water to readily enter the well, like the karst geology just discussed. There is a test protocol to determine if a well or other groundwater source is a GWUDI. The SWIG (Surface Water Influenced Groundwater) designation came about when new law was passed after the Freedom Industry Spill in Charleston, West Virginia. See West Virginia Code Chapter 16 - https://code.wvlegislature.gov/16-1-9C/. A SWIG is a source that will pass the GWUDI protocol but, due to the quantity and quality of the source, is still considered to



be heavily influenced by nearby surface water. There are currently nineteen SWIG sources in the Alluvial Aquifer along the Ohio River basin. Because of the influence of surface water upon these sources along with the Well Head Protection Area, an additional surface water area is delineated similar to a surface water source water protection area. Thus the utility considers Potential Sources of Significant Contamination that exist in both delineation areas when developing the source water protection plan. This picture illustrates both the Well Head Protection Area and the Surface Water Delineation relative to the water source.

Fortunately, in West Virginia the hard work of delineating source water protection areas is carried out by the West Virginia Department of Health through their Environmental Engineering Division, saving systems that trouble and expense. As the utility develops their source water protection plan, priority is given to Potential Source of Significant Contamination within the designated areas. The West Virginia Source Water Protection Map Viewer website (https://oehsportal.wvdhhr.org/wvswap/index.html) is used to research the permitted sources of potential contamination within those protection areas. There is also a confidential map viewer available only to utilities who need access to view confidential permits such as Tier II sites and Above Ground Storage Tanks. From there, utilities can develop management strategies to reduce the risk of contamination of their drinking water sources. More information can be found at the West Virginia Source Water Assessments and Well Head Protection Plans website (https://oehs.wvdhhr.org/eed/source-water-assessment-wellhead-protection/). For assistance with source water protection plan development or other source water questions, contact your WVRWA Sourcewater Specialist, Jerry Dotson at jerrydotson@wvrwa.org. ■

By Shannon Cochran, Lead and Copper Program Technician

Adaptability – Succeeding in the Workplace

Very so often, my wife and I ponder on how we ended up where we are today. Neither of us started out in the water and wastewater industry and we never would have met without it. In the ever-changing work environment we find ourselves in, we have to be able to adapt to whatever comes our way. Whether it's due to personal choices or outside factors, change is inevitable. I started out in school for pharmacy. Before I could complete my degree, an opportunity I couldn't turn down presented itself. That lead me to working as a rock driller, blaster, and coal miner for 17 years. In the mining industry, there's no such thing as job security.

After enduring several mine closures over the years, one of the last mines in my area closed. I had to adapt. Luckily, my local PSD was in need of an operator. Here I am now, a Class III Wastewater Operator with over 8 years in the industry. By being adaptable, I was able to respond to the situation I found myself in and overcome the challenge. For some, adaptability comes naturally; however, it's a skill you can develop. Below are six tips you can use to build and improve your adaptability skillset.

Work on your problem-solving skills. Problem-solving allows you to tackle issues as they arise. Problem-solving involves: identifying the problem(s) that needs to be resolved, brainstorming possible solutions, determining the best solution, and implementing the solution. The more you practice problem-solving, the easier it will become.

Embrace change. Whether you like it or not, "change is the only constant in life." Change can be frightening, but avoiding it won't make it go away. Instead of feeling stressed, try finding the positives of whatever change you may be facing. You may not realize it at first glance, but change can provide you with opportunities that you wouldn't have had otherwise. Next time change arises, embrace the situation for what it is and accept the possible results, whatever they may be. And, remember, be kind to yourself – change is never easy.

Practice an open mind. Many times, we shut ourselves off from new opportunities. We all have our own beliefs as to how we think things should go. Instead of embracing the things that could happen, we focus of what we think should happen. Don't let limiting beliefs about yourself and your abilities hold you back from new opportunities. Practice withholding judgements until you have all pertinent information. Don't go straight for what you know, but try to think about the situation from every point of view and consider all possibilities.

Set aside your ego. This goes hand-in-hand with keeping an open mind. Your ego is naturally self-centered and can limit you from seeing other perspectives and embracing change. How do you remove your ego from any given situation? Free your mind from how you think things should go. Be open to new ideas, even if they weren't your own. Allow yourself and others to express creative ideas. There are multiple solutions to a problem.

Practice mindfulness. The act of mindfulness is to focus on the here and now. Instead of rushing in with a solution, allow yourself to see the whole situation. Reflect on the things outside of your control and the things you can actually change. Mindfulness allows the problem-solving process to begin.

Get out of your comfort zone. It's natural to want to stay inside your comfort zone; however, this holds you back when change presents itself. Take small steps in putting yourself in new and challenging situations. Remember, in this instance, the outcome isn't important. It's the process itself that's helping you become more adaptive to change.

Adaptability is an ongoing process that takes time and practice. Learning to adapt will not only make you a more valuable employee, it will also give you a peace of mind because you know you'll be able to handle whatever comes your way. ■

SUDOKU PUZZLE

7			6					8
	2				3		4	
		6		7	2			
				2	7		9	
		9		8	4			1
1		2				3	7	4
					8	6		
6				4			1	
2	9	5		6			8	

The aim of the canonical puzzle is to enter a numerical digit from 1 through 9 in each cell starting with various digits given in some cells (the "givens"). Each row, column, and region must contain only one instance of each numerical. Completing the puzzle requires patience and logical ability.

Answers can be found on page 38.

By Marybeth Altizer, Lead and Copper Program Technician

Lead and Drinking Water: Safeguarding Children's Health

The Environmental Protection Agency's lead rule on drinking water is a critical measure aimed at protecting the health of children across the United States. Lead exposure, especially during early childhood, can have detrimental effects on physical and cognitive development. Understanding the implications of this rule is essential for ensuring the well-being of future generations.

Lead is a potent neurotoxin that can severely impact children's health, even at low levels of exposure. The developing brains and bodies of young children are particularly vulnerable to the effects of lead, which can lead to irreversible damage. Cognitive deficits, learning disabilities, and behavioral problems are just some of the consequences associated with lead exposure in children.

The EPA's lead rule on drinking water sets limits on the amount of lead permissible in public water systems. By reducing lead levels in drinking water, the rule aims to mitigate the risk of exposure and protect the health of children and other vulnerable populations.

Lead exposure can occur through various sources, including old lead-based paint, contaminated soil, and drinking water. While efforts to address lead paint and soil contamination have made significant progress, ensuring the safety of drinking water remains a crucial aspect of lead poisoning prevention.

Water utilities monitor and test for lead in drinking water, as well as take corrective action if lead levels exceed the regulatory limits. This proactive approach helps identify and address potential sources of lead contamination, thereby reducing the risk of exposure for children and communities.

Despite efforts to regulate lead in drinking water, challenges remain in ensuring compliance and addressing sources of lead contamination. Aging infrastructure, particularly in older cities and communities, poses a persistent risk of lead leaching into drinking water supply lines.

Moving forward, there are opportunities to enhance protections for children's health. This includes prioritizing infrastructure upgrades, investing in lead remediation opportunities such as replacing lead service lines, and testing for lead in schools.

We all play a crucial role in safeguarding the health and well-being of children across the United States. By reducing lead exposure through proactive monitoring, testing, and remediation efforts, the rule helps protect the most vulnerable members of society. However, ongoing efforts are needed to address remaining challenges and ensure that all children have access to clean and safe drinking water, free from the harmful effects of lead contamination. ■

Answers to Soduko Puzzle

7	4	3	6	1	9	5	2	8
9	2	1	8	5	3	7	4	6
8	5	6	4	7	2	1	3	9
3	6	4	1	2	7	8	9	5
5	7	9	3	8	4	2	6	1
1	8	2	5	9	6	3	7	4
4	1	7	9	3	8	6	5	2
6	3	8	2	4	5	9	1	7
2	9	5	7	6	1	4	8	3

By Michael Hersman, Water Circuit Rider

The Safe Drinking Water Act: Then, Now and Beyond

In December 2024, the Safe Drinking Water Act will turn 50 years old. In 1974, the Safe Drinking Water Act (SDWA) was passed by Congress and signed by President Ford. It protects public health by regulating the nation's public drinking water. The law was amended in 1986 and 1996 and required many actions to protect drinking water and its sources.

The SDWA authorizes the United States Environmental Agency (USEPA) to set national health-based standards for drinking water to protect both naturally-occurring and man-made contaminants that may be found in drinking water. USEPA, states, and water systems then work together to make sure that these standards are met.

The USEPA identifies contaminants that may adversely affect public health and occur in drinking water with a frequency and at levels that pose a threat to public health. They identify these contaminants for further study, and determine contaminants to potentially regulate. The USEPA determines a maximum contaminant level goal for contaminants it decides to regulate.

Originally, SDWA focused primarily on treatment as the means of providing safe drinking water at the tap. The 1996 amendments greatly enhanced the existing law by recognizing source water protection, operator training, funding for water system improvements, and public information as important components of safe drinking water. This approach ensures the quality of drinking water by protecting it from the source to the tap.

Currently, water utilities are dealing with the lead and copper rule revisions and per-and polyfluoroalkyl (PFAS) substances. The proposed rule includes standards for six PFAS and is expected to require a more than 40 billion investment in drinking water treatment facilities plus long-term operational and maintenance costs. So, what are the possible future regulations that are on the USEPA's radar? Manganese may be moved from the secondary list to the primary list. Carcinogenic volatile organic contaminants (CVOCS) are on USEPA's radar and will be their first attempt to regulate contaminants in a group. Water systems that serve a population of 10,000 or more will most likely be required to produce a consumer confidence report (CCR) twice per year. The USEPA is encouraging systems not to use the word "safe" in their CCR report; the rule will likely include changes to mandatory language and a requirement for information about corrosion control. Utilities may see a storage tank regulation in the future requiring collecting a set of parameters from individual storage tanks.

On the cybersecurity front, legislation is pending that establishes a sector-driven cybersecurity framework for water systems similar to that of the electric sector. All of this will move forward, completing the second round of risk and resilience assessments required by America's Water Infrastructure Act of 2018.

USEPA plans to revisit the microbial and disinfection by product risk management. Expect an announcement of a proposed rule by mid to late 2024. USEPA is set to revise the current primary standards for Cryptosporidium, Giardia, Haloacetic acids, Heterotrophic bacteria, Legionella, Total Trihalomethanes and viruses. Final action is expected by September 30, 2027. Regulatory measures may be taken to ensure distribution system management practices like storage tank inspection and maintenance, managing water age, and system flushing. The Centers for Disease Control estimates there are 7,000 deaths each year from waterborne disease. Most deaths are attributed to Legionella, Mycobacteria and Pseudomonas. There is a possibility that minimum secondary disinfection levels may change. Due to the brain eating amoeba Naegleria fowleri, the state of Louisiana increased their minimum chlorine disinfection level to 0.5 ppm.

There is a rule being advanced by the USEPA to revise risk management plans under the Clean Air Act that could set new requirements for chlorine gas users; a ban on the manufacture and use of asbestos that will require manufactures of hypochlorite to transition major production facilities to non-asbestos materials; and several non-SDWA rules for materials containing PFAS.

The SDWA has been crucial in determining what contaminants the USEPA has regulated and will be crucial in determining future regulations. Utilities will meet the challenge of what's next on USEPA's radar. ■

By Brian Arthur, Training Specialist

Operator Shortage, a Real Problem

April 2024 once again finds me on the road traveling to training classes. I have to admit that I missed doing the classes and seeing everyone. It is good to be back. But I was a little shocked as I traveled because a question kept being asked, "do you know where we could find an operator?" We have been saying an operator shortage was coming for years, and I believe it is here. A wave of recent retirees has left experienced water and wastewater treatment plant operators in short supply and high demand. This means higher pay for existing operators, which is good, but it also puts our utilities in a hard spot.

The increasing shortage could impact your plant's ability to run efficiently and effectively. Water and wastewater utilities need to ensure that customers can continue to rely on safe drinking water and vital wastewater services that protect public health and the environment. There are several options for mitigating the impact of impending shortages that your facility may be experiencing.

Here are a few methods of combating operator shortages:

- Actively recruit young people to the field through job fairs and internship opportunities. Also, remember the apprentice program.
- Cross-train employees and new hires to cover for each other and rotate non-operation employees into various plant operator positions, providing career-path opportunities for those who are interested in plant operations.
- Enter into an operator-sharing agreement with other water and wastewater plants.
- Consider outsourcing some plant operations to a service organization that offers experienced and licensed operators. Organizations that offer contract flexibility and a range of operations and maintenance services can do things such as:
  - Pull quarterly test samples and file compliance reports
  - Evaluate, develop, and provide employee training
  - Offer contract operators

If you determine that outsourcing plant operations is a viable option, select a service organization that can provide experienced operators that fit your needs.

Water and wastewater plants will soon face a shortage of experienced, certified operator professionals. To ensure that you are able to provide essential water and wastewater treatment operations, plan for one or more of these strategies, before the impending operator shortage impacts your plant.

Once again, thank you for the support as I return as your training specialist. I'll see you in class. ■

WVRWA's e-Newsletter, *News Droplets* provides information on new programs and benefits, training classes, conference, legislative news, and much more. If you are currently not receiving *News Droplets*, but would like to, please send your name and email address to connect@wvrwa.org to be added to the mailing list.

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Get Started on Your Water Utility Construction Project

Do you have a Water Utility Construction Project? Now is the time to act! Rates are at an all time low, and with the current pricing being opportunistic and taking action can result in benefits not only for your-self but for the customer as well. Consider the below items that detail positive reasons to act now that you can present to your governing body.

- Interest rates are at an all-time low.
- More project contractors are available, increasing the number of bids, potentially lowering project costs.
- Fuel costs are low, lowering pipe related costs.
- Most material costs for projects are down.
- Shipping costs for many have decreased.
- Road and water projects are easier to schedule due to decreased volume in traffic.
- Low construction costs and available contractors are not guaranteed to last.

USDA

USDA Rural Development is committed to helping improve the economy and quality of life in rural America. Offering loans, grants and loan guarantees are some of the ways Rural Development is supporting rural America.

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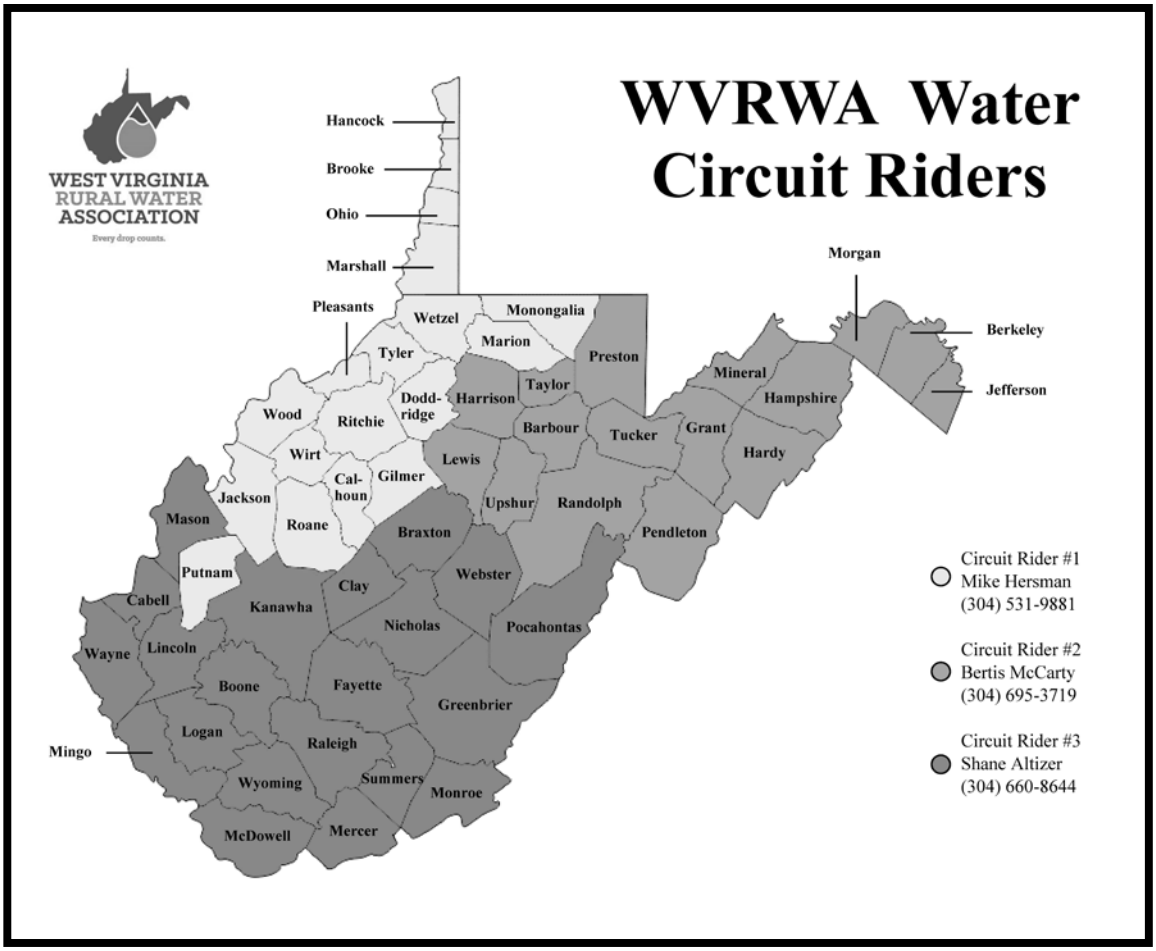
Every drop counts.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WW Circuit Rider #1
Jim Johnson
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We would like to give a special thanks to all of our current and former Board Members and Staff who have helped shape WVRWA.

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Belington
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Benwood
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Berkeley County PSWD
Berkeley Springs Water
Bethany Sanitation Board
Beverly
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Bingamon PSD
Bluewell PSD
Bradley PSD
Branchland-Midkiff PSD
Bridgeport
Brooke County PSD
Buckhannon
Burnsville
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Cameron
Canaan Valley PSD
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Cottageville PSD
Cowen PSD
Craigsville PSD
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Fountain PSD
Frankfort PSD
Franklin
Gary
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Gilbert Water
Gilmer County PSD
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Glen Dale
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Grandview Doolin PSD
Grant County PSD
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Hammond PSD
Hamrick PSD
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Harrisville
Hillsboro
Hodgesville PSD
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Hundred-Littleton PSD
Huntington Water Quality Board
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Huttonsville PSD
Ice's Run PSD
Jane Lew PSD
Kanawha Falls PSD
Kanawha PSD
Kenova Municipal
Keyser
Kingwood
Lavalette PSD
Leadsville PSD
Lewisburg
Lincoln PSD
Little Creek PSD
Logan
Logan County PSD
Lubeck PSD
Lumberport
Mannington
Mannington PSD
Marlinton
Marshall County PSD #2
Marshall County PSD #3
Marshall County PSD #4
Marshall County Sewage
Mason
Mason County PSD
Masontown
Matewan
Meadow Bridge
Middlebourne
Midland PSD
Mill Creek
Milton
Mineral Wells PSD
Monongah
Monumental PSD
Moorefield
Moorefield Regional Wastewater
Moreland MHP
Morgantown Utility Board
Moundsville Sanitary/Water
Mount Hope
Mount Hope Water Association
Mountain Top PSD
Mt. View Water Assoc.
Mt. Zion PSD
Nettie - Leivasy PSD
New Creek Water Assoc.
New Haven
New Martinsville
Newburg
Northern Jackson County PSD
Norton-Harding-Jimtown PSD
Nutter Fort
Oakland PSD
Oakvale Road PSD
Paden City
Parkersburg Utility Board
Parsons
Paw Paw Municipal
Paw Paw Rt. 19 PSD
Pea Ridge PSD
Pendleton Co. PSD
Pennsboro
Philippi
Piedmont
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Preston County PSD #4
Preston County Sewer PSD
Putnam PSD
Rainelle
Raleigh County PSD
Ravencliff-McGraws-Saulsville PSD
Ravenswood
Red Sulphur PSD
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Rowlesburg
Rupert
Salem
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Southern Jackson PSD
Southwestern Water PSD
Spencer
St. Albans MUC
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Triadelphia
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Tyler Co. PSD
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Union PSD
Union Williams PSD
Valley Falls PSD
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***Griffith & Associates, CPA's**
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Phone: (304) 756-3600
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***Lowe & Associates, PLLC**
1156 South Main Street
Milton, WV 25541
Phone: (304) 743-5573
See Our Ad Page 35

***Rural Water Financing Agency**
1151 Old Porter Pike
Bowling Green, KY 42103
Phone: (270) 843-2291

Attorneys

***Bowles Rice, LLP**
600 Quarrier Street
Charleston, WV 25301
Phone: (304) 347-1100
See Our Ad Page 6

*****Jackson Kelly PLLC**
500 Lee Street, E., Suite 1600
Charleston, WV 25301
Phone: (304) 340-1000
See Our Ad Page 4

***Kay Casto & Chaney, PLLC**
707 Virginia Street, E
Charleston, WV 25301
Phone: (304) 345-8900
See Our Ad Page 10

*****Steptoe & Johnson, PLLC**
P.O. Box 1588
Charleston, WV 25301
Phone: (304) 353-8000
See Our Ad Page 34

Insurance

*****Bill Bailey Insurance Agency, Inc.**
701 Highland Avenue
Williamstown, WV 26187
Phone: (304) 375-4900
See Our Ad Page 19

*****Bray & Oakley Insurance Agency, Inc.**
P.O. Box 386
Logan, WV 25601
Phone: (304) 784-4700
See Our Ad Page 44

****Hayes Insurance Agency**
202 Union Square
Marietta, OH 45750
Phone: (740) 373-2347
See Our Ad Page 16

Consultants

***Burgess & Niple, Inc.**
4424 Emerson Avenue
Parkersburg, WV 26104
Phone: (304) 485-8541
See Our Ad Page 45

***Cerrone & Associates, Inc.**
97 14th Street
Wheeling, WV 26003
Phone: (304) 232-5550
See Our Ad Page 10

***Chapman Technical Group**
200 Sixth Avenue
St. Albans, WV 25177
Phone: (304) 727-5501
See Our Ad Page 38

***Crews & Associates, Inc.**
69 Clay Street, Suite 202
Morgantown, WV 26501
Phone: (304) 292-6600
See Our Ad Page 40

*****E.L. Robinson Engr. Co.**
5088 Washington Street, West
Charleston, WV 25313
Phone: (304) 776-7473
See Our Ad Page 24

****Gwin, Dobson & Foreman, Inc.**
3121 Fairway Drive, Suite B
Altoona, PA 16602-4475
Phone: (814) 943-5214
See Our Ad Page 32

*****Hornor Brothers Engineers**
P.O. Box 386
Clarksburg, WV 26302
Phone: (304) 624-6445
See Our Ad Page 46

***New River Engineers, Inc.**
501 Eagle Mountain Road
Charleston, WV 25311
Phone: (304) 342-7168
See Our Ad Page 35

***Potesta & Associates, Inc.**
7012 MacCorkle Avenue, SE
Charleston, WV 25304
Phone: (304) 342-1400
See Our Ad Page 36

***RK&K**
159 Plaza Drive
Keyser, WV 26726
Phone: (304) 788-3370

***Rockacy & Associates, Inc.**
2528 Thrush Road
Charlottesville, VA 22901
Phone: (800) 836-1011
See Our Ad Page 10

***Stantec Consulting Services, Inc.**
320 Southview Drive, Suite 102
Bridgeport, WV 26330
Phone: (304) 816-5199
See Our Ad Page 6

***Stiffler, McGraw and Assoc., Inc.**
1731 N. Juniata Street
Hollidaysburg, PA 16648
Phone: (814) 696-6280
See Our Ad Page 16

****The EADS Group, Inc.**
250 Scott Avenue
Morgantown, WV 26508
Phone: (304) 212-5927
See Our Ad Page 38

*****The Thrasher Group, Inc.**
600 White Oaks Blvd.
Bridgeport, WV 26330
Phone: (304) 624-4108
See Our Ad Page 28

Contractors

***Breckenridge Corporation**
P.O. Box 247 Brickyard Road
Buckhannon, WV 26201
Phone: (304) 472-3350
See Our Ad Page 38

Laboratories

***Mineral Labs, Inc.**
P. O. Box 549
Salyersville, KY 41465
Phone: (606) 349-6145

***Pace Analytical**
225 Industrial Park Road
Beaver, WV 25813
Phone: (800) 999-0105
See Our Ad Page 32

***Preiser Scientific**
94 Oliver Street
St. Albans, WV 25177
Phone: (800) 624-8285
See Our Ad Page 36

Services and Products

****A to Z Plumbing, LLC**
1013 Crestmont Road
Hurricane, WV 25526
Phone: (304) 415-2015

***Advance Instruments**
10200 Brecksville Road
Brecksville, OH 44141
Phone: (440) 596-1432
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****Advanced Rehabilitation Technology**
525 Winzeler Drive, Unit 1
Bryan, OH 43506
Phone: (419) 636-2684
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****American Cast Iron Pipe/ American Flow Control**
2257 Clairmont Drive
Suite 220-222
Pittsburgh, PA 15241
Phone: (412) 721-9509
See Our Ad Page 3

***AMS**
1127 Judson Road, Unit 233B
Longview, TX 75601
Phone: (844) 475-8343

***Appalachian Software, Inc.**
44 Amber Way
Scott Depot, WV 25560
Phone: (304) 757-1260
See Our Ad Page 40

***Benchmark Construction Co., Inc.**
P. O. Box 1018
Hurricane, WV 25526
Phone: (304) 881-1735
See Our Ad Page 40

***BissNuss, Inc.**
7 Court Street, Suite 260
Canfield, OH 44406
Phone: (330) 533-5531
See Our Ad Page 40

***Buchanan Pump Service & Supply Co., Inc.**
P.O. Box 827
Pound, VA 24279
Phone: (276) 796-5473
See Our Ad Page 10

***C2G Engineering, Inc.**
641 Industrial Park Road
Beaver, WV 25813
Phone: (681) 368-3400

****CITCO Water**
4034 Altizer Avenue
Huntington, WV 25705
Phone: (800) 999-3484
See Our Ad Page 2

***Clow Valve Co.**
5908 Sodom Hutchings Road
Farmdale, OH 44417
Phone: (330) 360-4550
See Our Ad Page 36

***Consolidated Pipe & Supply Co., Inc.**
907 Honeybranch Industrial Park
Debord, KY 41214
Phone: (606) 298-0333
See Our Ad Page 38

***Core & Main**
2825 Fairlawn Ave.
Dunbar, WV 25064
Phone: (304) 768-0086
See Our Ad Page 16

***CUES, Inc.**
3600 Rio Vista Avenue
Orlando, FL 32805
Phone: (407) 849-0190

***Daman Superior**
754 Kittanning Hollow Road
East Brady, PA 16028
Phone: (724) 664-6089

***DN Tanks, Inc.**
39 East Main Street
Mechanicsburg, PA 17050
Phone: (717) 356-0491
See Our Ad Page 36

***Dutchland, Inc.**
160 Route 41
Gap, PA 17527
Phone: (717) 442-8282
See Our Ad Page 40

***Eastcom Associates**
185 Industrial Parkway, Suite G
Branchburg, NJ 08876
Phone: (908) 722-7774

***Edmunds GovTech**
301 Tilton Road
Northfield, NJ 08225
Phone: (609) 645-7333

***EnviroScience, Inc.**
5070 Stow Rd.
Stow, OH 44224
Phone: (330) 688-0111

***Extreme Endeavors**
1063 Hickory Corner Rd.
Philippi, WV 26416
Phone: (304) 457-2500
See Our Ad Page 36

***Ferguson Waterworks**
698 Middletown Rd.
White Hall, WV 26554
Phone: (681) 404-2857
See Our Ad Page 35

***Forberg Smith**
800 Old Pond Road, Suite 705
Bridgeville, PA 15017
Phone: (412) 420-7262

***Ford Meter Box**
775 Manchester Avenue
Wabash, IN 43056
Phone: (260) 563-3171
See Our Ad Page 40

***Fortiline Waterworks**
7025 Northwinds Drive NW
Concord, NC 28027
Phone: (704) 788-9800

*****FPG**
605 Sheridan Rd., Suite 100
Noblesville, IN 46060
Phone: (317) 565-5012
See Our Ad Page 26

***Gilson Engineering Sales, Inc.**
535 Rochester Road
Pittsburgh, PA 15237
Phone: (304) 342-0012

***Golden Equipment Co., Inc.**
P.O. Box 873
Mars, PA 16046
Phone: (800) 242-1494

***Hawkins, Inc.**
1161 Commercial Ave., S.E.
New Philadelphia, OH 44663
Phone: (573) 881-0756
See Our Ad Page 32

***Infratech Solutions, LLC**
6004 Wellesley Drive
Wilmington, NC 28409
Phone: (910) 617-0291
See Our Ad Page 16

***InstruLogic**
212 Fort Collier Road
Winchester, VA 22603
Phone: (540) 338-2222

*****JABO Supply Corporation, Inc.**
5164 Braley Street
Huntington, WV 25705
Phone: (304) 736-8333
See Our Ad Page 27

***JHA Companies**
466 S. Main Street
Montrose, PA 18801
Phone: (844) 542-4757
See Our Ad Page 40

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1021 E. Water Street
Elmira, NY 14901
Phone: (804) 807-0484

***Learco Equipment Company**
13032 Frankstown Road
Pittsburgh, PA 15235
Phone: (412) 221-4888
See Our Ad Page 10

***Maryland Biochemical Co., Inc.**
712 Tobacco Run Drive
Bel Air, MD 21015
Phone: (800) 771-7252
See Our Ad Page 2

*****Master Meter, Inc.**
101 Regency Parkway
Mansfield, TX 76063
Phone: (937) 902-4663
See Our Ad Page 25

***McWane Ductile**
2266 South 6th Street
Coshocton, OH 43812
Phone: (330) 260-9292
See Our Ad Page 6

***Mid Atlantic Storage Systems, Inc.**
1551 Robinson Road, SE
Washington Court House, OH 43160
Phone: (740) 335-2019

***Miller Environmental, Inc.**
320 S. 17th Street
Reading, PA 19602
Phone: (610) 376-9162

****Mountaineer Generator Service**
400 Airport Road, Suite 7
Elkins, WV 26241
Phone: (304) 636-0011

***Munibilling**
3300 Battleground Avenue, Suite 402
Greensboro, NC 27410
Phone: (800) 259-7020

***Nexbillpay, LLC**
2416 Green Springs Highway
Birmingham, AL 35209
Phone: (800) 639-2435

***Pennoni**
117 E. Piccadilly St.
Winchester, VA 22601
Phone: (540) 771-2091
See Our Ad Page 10

***Pittsburg Tank & Tower Co.**
P.O. Box 913
Henderson, KY 42419
Phone: (270) 826-9000
See Our Ad Page 36

***ProSource Water Products, Ltd.**
14680 Pleasant Valley Road
Chillicothe, OH 45601
Phone: (888) 772-5478
See Our Ad Page 6

****PumpMan West Virginia**
P.O. Box 199
Allison Park, PA 15101
Phone: (412) 487-7140
See Our Ad Page 45

***Quality Water Services, LLC**
160 John Street
Weston, WV 26452
Phone: (304) 269-0072
See Our Ad Page 10

***Service Pump & Supply Co.**
P.O. Box 2097
Huntington, WV 25721
Phone: (304) 429-6731
See Our Ad Page 6

***Shafer, Troxell & Howe, Inc.**
97D Monocacy Blvd.
Frederick, MD 21701
Phone: (301) 682-3390
See Our Ad Page 37

****Smith-Midland Corporation**
P.O. Box 300
Midland, VA 22728
Phone: (540) 439-3266
See Our Ad Page 31

***Southern Corrosion, Inc.**
738 Thelma Road
Roanoke Rapids, NC 27870
Phone: (434) 262-1613
See Our Ad Page 45

***State Equipment Inc.**
P.O. Box 3939
Charleston, WV 25339
Phone: (304) 776-4405
See Our Ad Page 6

***Tepco-Trombold Equipment Co., Inc.**
P.O. Box 897
Mars, PA 16046
Phone: (724) 625-4260
See Our Ad Page 6

***The Sherwin Williams Company**
Protective & Marine Division
139 Dover Drive
Moon Township, PA 15108
Phone: (717) 753-0653

***Thompson & Litton**
1105 Mercer Street
Princeton, WV 24740
Phone: (304) 425-9555
See Our Ad Page 35

***Tri State Industrial Coating**
Contractors Alliance
1591 Washington Street, East
Charleston, WV 25311
Phone: (304) 546-2896
See Our Ad Page 40

****U.S. Pipe & Foundry Co., Inc.**
2247 Maiden Lane
Roanoke, VA 24015
Phone: (540) 353-7425

*****USABlueBook**
3781 Burwood Drive
Waukegan, IL 60085
Phone: (800) 548-1234
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***Utility Solutions, Inc.**
327 Curtis St.
Delaware, OH 43015
Phone: (740) 369-4300
See Our Ad Page 16

****Utility Technologies, LLC**
1054 Monroe Rd., Suite 105
Lebanon, OH 45036
Phone: (513) 488-1940
See Our Ad Page 8

***Valtronics, Inc.**
P.O. Box 490
Ravenswood, WV 26164
Phone: (304) 273-5356
See Our Ad Page 32

***Warren Pump & Supply**
1551 Jackson Avenue
Huntington, WV 25704
Phone: (304) 429-6723
See Our Ad Page 10

***Water Development Authority**
1009 Bullitt Street
Charleston, WV 25301
Phone: (304) 414-6500
See Our Ad Page 36

***Zenner USA**
15280 Addison Road, Suite 240
Addison, TX 75001
Phone: (972) 386-6611

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PROTECTING OUR ENVIRONMENT

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National Radio Astronomy Observatory

Peterkin Camp & Conference Center

Valley Vista Adventist Center

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Ashland Scenic Campground

Global Capital of World Peace

Knobley Mountain Water System

Mettiki Coal (WV) LLC

Newell Company

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Timothy Bennett
Tom Brown
Kennon Chambers
John Cobb
Brandon Conley
Bruce Darner
Matt Dawson
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Kevin "Ricky" Hamrick, Jr.
Michael Hawranick
John Inghram
Ernie Jack
Loren Jordan
Jim Klein
Patricia Lee
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James Mitchell
Kelly Ann Naylor
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