

SOLVING WATER IN RURAL AMERICA: A XYLEM REPORT

Rural communities across the United States face increasing challenges related to limited water access and poor water quality. Access to clean, safe water affects 2 million Americans and often is associated with poor health, poverty and other quality of life outcomes. This report outlines the problems, progress and future action necessary to solve the growing water crisis in rural America.



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RURAL AMERICA'S DRINKING WATER CRISIS

More than 46 million Americans, or **15% of the total U.S. population, live in rural America**, according to 2020 U.S. Census data. How they get their water, the quality of that water, or if they get water at all, is far from certain. Pervasive and serious water quality problems are increasingly common throughout the U.S. and are caused by a wide range of factors, among them: deteriorating infrastructure, ineffective water treatment facilities, contaminated wells from agricultural runoff and other pollutants, and private or community wells that have gone dry or have been contaminated by floodwaters and stormwater runoff.

Access to safe water for all Americans has been a goal since the passage of the Clean Water Act in 1972, but nearly 50 years later the water gap still exists – and it's growing. **More than 2 million people in America today do not have access to the basic human right of clean, safe drinking water.**

Millions more might be drinking contaminated water from wells or small systems not regulated by the Environmental Protection Agency.

The reality for those whose water systems are covered by EPA regulations is not much better. In its analysis of EPA data on the approximately 50,000 active community water systems in the U.S., the National Resources Defense Council reported that over a three-year period from 2016 to 2019, nearly 130 million people got their drinking water from systems that violated the federal Safe Water Drinking Act. Small water systems – those that serve less than 3,300 people and serve mainly rural communities – were responsible for more than 80% of all violations.

WHAT IS THE DEFINITION OF RURAL AMERICA?

The U.S. Census Bureau defines rural as all population, housing and territory not included within an urbanized area or urban cluster.

AMERICA IS IN A WATER CRISIS.

In cities where advanced wastewater treatment facilities and expansive pipelines supply quality water, poor system maintenance, infrastructure failures and natural disasters reveal the very serious effects poor water quality can have. From Flint, Michigan, to Newark, New Jersey, the poor condition of pipes and aging treatment plants has led to inadequately treated drinking water, exposing residents to harmful chemicals and toxins.

Climate change and severe weather events are also impacting the United States' drinking water supply. In many areas, increased water temperatures cause eutrophication and excess algal growth, which reduces drinking water quality. And more frequent extreme storm events resulting in increased sediment and nutrient buildup is further compromising the quality of drinking water sources.

Ultimately though, it's rural areas that bear a disproportionate burden of the health and economic consequences that come with this infrastructure crisis.

Research by the Centers for Disease Control and Prevention and other organizations has shown a significant gap in health between rural and urban Americans. When water poverty is in play, people are more likely to be living in economic poverty, itself linked to a number of poor health outcomes.

Social determinants of health, such as the availability of resources to meet daily needs and access to educational, economic and job opportunities, can have a significant influence on health outcomes. Grouped into five domains, each has a significant and interrelated impact on people's health, well-being and quality of life.

WHAT ARE SOCIAL DETERMINANTS OF HEALTH?

Social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, worship and age that affect a wide range of health, functioning and quality-of-life outcomes and risks. Social determinants of health have a major impact on people's health, well-being and quality of life. Examples include:



**SAFE HOUSING,
TRANSPORTATION AND
NEIGHBORHOODS**



**RACISM,
DISCRIMINATION
AND VIOLENCE**



**EDUCATION, JOB
OPPORTUNITIES
AND INCOME**



**ACCESS TO NUTRITIOUS
FOODS AND PHYSICAL
ACTIVITY OPPORTUNITIES**



**POLLUTED AIR
AND WATER**



**LANGUAGE AND
LITERACY SKILLS**

Source: **Healthy People 2030**, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion.

WATER IN CRISIS: A PERSONAL STORY

"...RURAL, NORTHWEST ARKANSAS (IS) AN AREA OF GREAT NATURAL BEAUTY, BUT WHERE ACCESS TO BASIC SERVICES LIKE DRINKING WATER CAN BE EXTREMELY DIFFICULT. LIFE WITHOUT DRINKING WATER CAN BE STRENUOUS AND STRESSFUL."



MIKE FRAZEE,
ROGERS, ARKANSAS

On living in America without access to safe drinking water during a hearing before the U.S. Senate subcommittee on Innovative Financing and Funding: Addressing America's Crumbling Water Infrastructure, July 20, 2017

"You are constantly worried about how much water you have and how much water will be consumed in simple day-to-day activities. In my part of the world, people drive every day, thousands of miles a year, to haul water from a coin-operated water machine to their homes. And, if that water machine is broken or you have a snow or ice storm, you might have to go several days without water.

Many people in our area (veterans, disabled, single parents) are down on their luck, just trying to do right and survive. These folks can't go to a bank and ask for loan to pay for a well. We don't have an opportunity to tap into city or rural water systems. Many of our neighbors struggle to have water. We have seen single moms taking their children to haul water in buckets. One also worries about the quality of the water being hauled. The water machine I used has a sign that states, 'We cannot insure the quality of the water.' ... How awful is that?"

WATER'S EFFECT ON PROSPERITY.

In 21st century America it's hard to imagine life without internet, let alone clean water. According to 2018 U.S. Census Bureau statistics, 78% of U.S. households subscribe to the internet, higher in urban versus rural areas.

In counties with median incomes below \$50,000, rates drop to 65% and as low as 40% in some parts of the southern U.S.

According to a report by EducationSuperHighway, this digital divide between urban and rural America is largely due to affordability, not necessarily the lack of broadband infrastructure, tying back to social conditions that affect people's daily lives.

In the context of water access, a person who cannot maintain personal hygiene because they don't have clean water to shower or bathe are disadvantaged in getting a job. Without a steady income and insurance, regular doctor visits are often postponed or ignored, even when health issues occur. It's a perpetuating, downward cycle that people, on their own, often cannot rise above.

With help, that narrative can change. Mike Frazee, the rural Arkansas man who testified before U.S. senators about the difficulties of life without clean water access, and his parents, Ron and Marge Frazee, were the first recipients of a low-interest loan through the Water Systems Council's Water Well Trust to drill a water well in 2014, ending decades of hardship for the family.

"We need to move from a system where we rely on disasters and people losing access to water and having their health, their lives and their economic safety massively impacted to a more proactive model where we're making folks aware and managing (water issues)," said George McGraw, founder and CEO of Dig Deep, a nonprofit dedicated to ensuring every American has clean, running water.



WATER WELLS OFFER VIABLE SOLUTION

The Water Well Trust was established in 2010, a national nonprofit organization helping low-income Americans receive access to a clean water supply. Grant monies through the United States Department of Agriculture are used to provide low-interest loans to those seeking new or improved water wells. Loans have an interest rate of 1% with terms of up to 20 years, which amounts to about \$50 a month, often less than the cost of purchasing bottled water.

“Wells and well systems are a godsend to rural communities like mine,” Frazee testified. “My dad, who is a disabled veteran, spent much of his life hauling water to our home. My mother was constantly stressed about the water level in the tank outside our home. We were never going to have the resources to pay for a drinking water treatment facility or run water lines many miles.”

The Frazee’s story is a familiar one to Water Well Trust Director Margaret Martens. She and her team know firsthand the social and economic complexities that surround water access. For many low-income Americans, simply owning property is a huge hurdle to overcome. But their dreams of economic independence mean little without water.

“People don’t think they are going to end up in these situations,” Martens said. “If they don’t have the basic resource of water we see how it perpetuates this cycle of poverty. They are doing all they can to survive.”

According to the Water Systems Council, small and rural communities can realize up to a 75% cost savings by using water wells versus municipal pipeline systems. The WSC and Water Well Trust were instrumental in shaping infrastructure legislation to highlight the value of water wells. The Water Infrastructure Improvements for the Nation (WIIN) Act helps to reduce the federal, state and local costs of providing high-quality drinking water to millions of Americans who live in rural communities by facilitating the use of cost-effective alternatives like water well systems.

To date, Water Well Trust has facilitated grants to 285 property owners in 25 states and has a waiting list of more than 291, with an additional 284 inquiries in progress. Its work is bringing greater awareness to the plight of many rural Americans, along with the recognition that broader solutions require a commitment from both public and private entities.

ADVANTAGES OF WELL WATER



READILY AVAILABLE
SUPPLY OF WATER



COST-EFFECTIVE
WAY TO DELIVER
WATER TO RESIDENCE



LONG LIFE SPANS
(30-50 YEARS)



WELLS ARE A GREAT
WAY TO OBTAIN WATER
IN ALMOST ANY REGION

* Source: National Ground Water Association. “Cost Comparisons of Local Groundwater Sources to Regional Waterlines” report, March 2021

PUBLIC/PRIVATE PARTNERSHIP

Global water technology company Xylem Inc. is a leading manufacturer of water well pumps through its Goulds Water Technology brand and has been on the forefront of water access efforts. The company works closely with government officials and advocacy groups like the Water Systems Council (WSC) on public policy to solve domestic water challenges. Along with the WSC, Xylem helped lobby Congress for the 2016 passage of the WIIN Act, which includes provisions to help small and economically disadvantaged communities improve access to safe, reliable water.

A short time later, Xylem developed a relationship with WSC's nonprofit arm Water Well Trust, along with its distributor and dealer partners, to bring water to additional families in need through Xylem's Watermark program. In 2019, Xylem partnered with The Chris Long Foundation and the Water Well Trust to bring further awareness to domestic water issues. The Hometown H2O program provides free

of charge access to clean water through the installation of water wells for homeowners who meet program criteria.

"Every American has the right to clean and safe drinking water, and well water systems are a great way to affordably ensure that it is available," said Susan O'Grady, senior director of marketing, Xylem. **"Both private wells and community wells need to be seriously considered for small towns. The cost savings are tremendous, as is the quality of the water itself. The only thing lacking here is the awareness that wells are an option."**

Drawing water from a private well as opposed to a municipal water system can offer several advantages, from low utility costs to a naturally filtered water supply that contains beneficial minerals and nutrients that often get removed from public drinking water during the disinfection process.

LEGISLATIVE INITIATIVES THAT SUPPORT CLEAN WATER



WHEN EXTENDING PUBLIC WATER INFRASTRUCTURE MAKES SENSE

Although connecting to public water systems is often cost prohibitive and impractical in rural areas where homes are widely dispersed, there are a number of small, densely populated rural communities bordering cities and towns with centralized municipal sewer and water systems. Despite their proximity, these unincorporated communities lack water and sewer service for varying reasons.

Extending municipal water systems to nearby rural communities can be an expensive investment, but in some cases the benefits could outweigh the costs. Extending water and sewer infrastructure offers the potential for economic development by drawing new businesses, creating jobs and increasing a community's tax base.

To help offset expensive infrastructure costs, rural utilities rely heavily on federal grant and loan programs like the U.S. EPA's Drinking Water State Revolving Fund, where states can

receive grants to provide loans to public water systems for drinking water projects, and the U.S. Department of Agriculture's Rural Development's Water & Environmental Programs, which provide grants and low-interest loans to rural communities to develop drinking water and waste disposal systems for communities with 10,000 or fewer residents. Additionally, many states offer supplementary resources to help provide low-cost financing for water and wastewater projects.

"Decentralized technology is going to be a silver bullet for a lot of communities going forward," said Dig Deep's McGraw. "It's a series of approaches that makes sense for the scale of the community. It might be a household, it might be a cluster of households, it might be a very small town. The technologies have become so much more specific and manageable that you can achieve the operational economy you need at a smaller unit level. I think it's going to solve a lot of problems in rural America."

XYLEM WATERMARK: ENGAGING PARTNERS TO SOLVE WATER

Watermark is Xylem's corporate citizenship and social investment program with a mission to provide and protect safe water resources for communities in need around the world and educate people about water issues. Since its founding in 2008, it has provided clean water and sanitation solutions to over 3 million people in 25 countries.

In 2016, Xylem Watermark shifted its attention from a platform strictly focused on philanthropic partnerships to a more formalized employee engagement program. Then in 2019, Watermark implemented additional changes to maximize how employees engage with the program in support of Xylem's sustainability and business goals and the company's drive to create social and economic value. Watermark volunteer opportunities have since been extended to include customers, supply partners and investors.

"We're amplifying the impact of Watermark through employee engagement," said Emma Housman, program manager, Xylem Watermark. "Employees and partners are donating their time, skills and expertise to build relationships and make a greater impact."

The partnership with Waterboys' Hometown H2O program directs Xylem Watermark's community of stakeholders, employee volunteers and product donations toward an important cause – delivering access to clean water in the United States.

"With so many of our neighbors living without this essential resource, the water sector has an opportunity to help," said Susan O'Grady, senior director of marketing, Building Services & Agriculture. "By combining the unique capabilities of Water Well Trust, our Watermark program and our industry knowledge with the Waterboys' base of dedicated volunteers and partners, we are bringing water to communities that need it, and awareness to an important national issue."

REGIONAL WATER CHALLENGES LEAD TO WATER ACCESS DIVIDE

Diverse water quality challenges persist across the United States. In western regions, states like California and Arizona are experiencing exceptional drought conditions. While on the East Coast and parts of the South, flooding from intense storms frequently results in untreated sewage being released into local waterways.

In the Carolinas, the Northeast, Michigan and California, “forever chemicals” or PFAs like 1,4-dioxane – once used for industrial purposes – have leached into groundwater sources. In other areas of the United States like the Midwest, where farming is prevalent, agricultural runoff from pesticides and nutrients is contaminating groundwater and surface water.

In the Great Plains region and parts of the Southwest, irrigation practices by commercial farms have led to the depletion of groundwater resources resulting in the drying up of wells and decreased groundwater quality.

With all of these simultaneous struggles, the problem of inadequate access to clean, safe water has become more prevalent.

Water technology providers like Xylem are on the frontlines of helping municipalities reduce their risk and improve their overall resilience through monitoring, management and treatment solutions to help eliminate contaminants and prevent sanitary sewer overflows.

Xylem has developed innovative technologies that play a key role in improving water quality, while allowing for early warning and rapid response to events such as floods and algal blooms.

“We’re very involved with the academic world and partnering with universities to do research on alternative technologies and approaches for the future that demonstrate promise on a smaller scale,” said Kevin Flis, a business development manager for Xylem.

Effective water management also plays an important role, as floods and contaminated water can significantly damage the performance of essential networks. Water meters help discourage waste, while fixing aging infrastructure will keep more water in the system. In the agriculture sector, reducing irrigation by as little as 2% could prevent shortages in one-third of affected basins. Farmers can also save water by implementing solutions like drip irrigation and soil moisture sensors.

Xylem has also made itself available as resource to assist federal agencies and elected officials,

“I think that’s the biggest thing right now; bringing a higher level of awareness and making sure people understand there are solutions out there,” said Flis.



UNDERSTANDING REGIONAL WATER CHALLENGES ON A PERSONAL LEVEL

The following is a snapshot of rural families in different regions of the United States impacted by water insecurity who have benefited from the donation of a water well, along with examples of water-well solutions for agricultural challenges.

PACIFIC NORTHWEST

JEWELL, OREGON

The Pacific Northwest has faced severe drought conditions in recent years impacting the region's residential water supply. Due to climate change, rising temperatures have resulted in drier summers, intensifying drought stress on native ecosystems, increasing the risk of wildfires and decreasing freshwater availability.



HEALTH ISSUES MAGNIFY FAMILY'S CLEAN WATER OBSTACLES

Seeking peace and quiet, Steve and Lana Gleason moved to the rural logging community of Jewell, Oregon, in 1986. But tranquility came without running water. For 34 years, the Gleasons have pumped water for washing and bathing from a nearby river and made 40-mile round trips from their home to haul drinking water from a spring.

"It's amazing we could live so primitively all these years," said Steve Gleason.

For Steve Gleason, a retired commercial fisherman who suffers from COPD and heart issues, the weekly trips to haul drinking water had become increasingly arduous. Then, in 2019, the Gleasons' river pump failed due to heavy silt buildup.

After unsuccessfully applying for a bank loan to install a water well, a neighbor suggested the Gleasons apply for assistance through the Water Well Trust. In September 2020, Hometown H2O donated a new water well to the couple.

As part of the project, Xylem donated equipment. A local Bell & Gossett representative, pump installer and water well driller coordinated the discounted installation.

"There is no way we could have done this on our own," Steve Gleason says. **"Every day I woke up wondering if the (existing) pump would turn on. Now I can rest easy knowing we have water from our very own well."**



MORE THAN 300 WELLS HAVE GONE DRY ACROSS OREGON THIS YEAR DUE TO DROUGHT.

Source: Oregon Health Authority

[VIEW VIDEO CASE STUDY HERE](#)

SOUTHWEST BULVERDE, TEXAS

Texas' groundwater supply is under increasing pressure due to exponential population growth and more frequent droughts resulting from climate change. The fastest-growing use of water in the state is municipal, not agriculture, and pipeline projects like Vista Ridge, which exports groundwater from rural Central Texas to San Antonio residents, are leaving rural landowners with low- or no-yield wells.



FROM POOR WATER QUALITY TO NO WATER AT ALL

In Bulverde, Texas, Luis and Nancy Salazar and their family made do with sharing water from a well located on the neighboring property owned by Nancy Salazar's parents for two decades. Because of the shared well's low yield, the Salazars could not wash their cars or plant a garden. Even the idea of a long, hot shower was a luxury.

Financing and building a water well posed a significant financial challenge to the Salazars, who devoted much of their modest income to caring for daughter Nissi, who has cerebral palsy.

In 2019, Nancy Salazar's elderly parents decided to move from their longtime home. As a result, drawing from a shared water source would no longer be possible. While doing an internet search on how to finance a private water well, Nancy Salazar discovered the Water Well Trust and reached out for assistance. A few weeks later, the Salazar family learned they qualified for a grant due to their need and income status.

Xylem Watermark provided a grant for the project as well as equipment and volunteer labor. Other contributions came from the local Bell & Gossett representative and drilling company.

Overall, with assistance from Water Well Trust and Xylem, along with product and service donations, the final project cost came in around \$6,500. In contrast, hooking up to the closest public water supply would have cost nearly \$85,000.

"Water is freedom; freedom and independence," said Nancy Salazar.

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**GROUNDWATER PROVIDES 99% OF
DRINKING WATER FOR THE RURAL
POPULATION IN TEXAS.**


Source: Texas Groundwater Protection Committee



An aerial photograph showing a large yellow drilling rig on the left side of the frame. The rig is a tall, vertical structure with various mechanical components and a ladder. To the right of the rig is a yellow truck with a flatbed trailer. The trailer is loaded with a large stack of white PVC pipes, secured with yellow straps. The ground is a mix of dirt, gravel, and sparse vegetation. In the bottom right corner, a portion of a red corrugated metal roof is visible. The overall scene depicts a well-drilling operation in a rural or undeveloped area.

RESTORING RUNNING WATER AFTER FOUR YEARS WITHOUT

Hometown H2O, the partnership between Xylem, Waterboys and Water Well Trust, installed a new well for the Solares family of Bertram, Texas in December 2021. The family had been living without running water since their existing well collapsed in 2018.

[VIEW VIDEO CASE STUDY HERE](#) 

APPALACHIAN REGION

CANDLER, NORTH CAROLINA

In the rural Appalachia region, thousands of residents struggle with issues of water quality and accessibility. Steep, rough terrain, isolation and poverty complicate life for Appalachians who need access to adequate water supply and septic systems. What's more, the practice of surface mining is contaminating groundwater in the area with harmful pollutants like iron, sulfur and arsenic, which can lead to inequities and serious health consequences for residents.

CANDLER,
NORTH CAROLINA

DEFUNCT SYSTEM DEPRIVES FAMILIES OF BASIC RESOURCES

In North Carolina, clean and safe drinking water is one of the most critical environmental and public health issues. Roughly one-third of North Carolina residents, or 3.3 million people, rely on private well water. Yet, many private well users lack the knowledge and resources needed to routinely monitor and maintain their well water.

That was the case for homeowners in the Holly Ridge subdivision in Candler, North Carolina. After years of trying to manage the neighborhood well system on their own, Holly Ridge residents acknowledged that the system had fallen into severe disrepair, leaving 24 households (including 45 adults and 18 children) with inadequate pressure, discolored odorous water or no water at all.

Because the Holly Ridge neighborhood is located in a remote, hilly area, hooking into the municipal water supply would have been difficult and cost-prohibitive for homeowners.



The Holly Ridge project, which involved rehabilitating the existing wells, cost just over \$45,000, \$3 million less than the cost of connecting to the municipal system.

Working with Water Well Trust, Xylem provided all the materials to rehabilitate the Holly Ridge wells and employee volunteers rebuilt the well houses.

Repairs were made to three of the wells and a fourth well was decommissioned as it was no longer viable. Low well yield, which is typical of the Appalachian region, prompted the installation of variable frequency drives and large holding tanks.

“Residents are grateful to be able to shower, to drink water and to bathe their children with clean water again,” said Xylem’s O’Grady, who coordinated the project.

[VIEW VIDEO CASE STUDY HERE](#)

**52% OF NORTH CAROLINA'S
POPULATION DEPENDS UPON
GROUNDWATER FOR ITS
DRINKING WATER SUPPLY.**

Source: North Carolina Ground Water Association



MIDWEST RUTLAND, ILLINOIS

Sandstone aquifers are a major water resource in Central Illinois, but these aquifers have experienced declining water levels as a result of population growth and economic expansion. Water quality in some of the aquifers used for water supply also presents challenges.

In October 2021, Xylem, Water Well Trust and The Chris Long Foundation's Waterboys partnered on the sixth Hometown H2O project to provide the Drummet/Applen family in Rutland, Illinois, with a new water well and pump system. Since their well pump failed in 2020, the family had been relying on a cistern and rainwater as well as truck delivery, costing them hundreds of dollars per load.

WEST COAST

SANTA MARIA, CALIFORNIA

California's prolonged and near-record-setting drought is taking a severe toll on one of the state's biggest economic drivers – agriculture. Farmers have regularly weathered droughts in California, but the water scarcity in 2021 is proving to be particularly difficult. The government has drastically reduced water allotments and farmers across the state are under increasing pressure to cut back on groundwater use.



MAKING FARMING OPERATIONS MORE EFFICIENT, PROFITABLE

Eat Sweet Farms, an agricultural operation in Santa Maria, California, has long focused on growing different varieties of berries like strawberries, blueberries and blackberries. In 2019, the local grower decided to expand its crops to include avocados in an effort to capitalize on 20 previously unused acres of barren hillside.

The multilevel terrain, though ideal for avocado farming, posed a challenge for effectively irrigating the crops. At the steepest elevation, water had to travel 500 feet uphill, but only 100 feet at its lowest elevation.

Seeking to boost energy efficiency without increasing costs, Eat Sweet Farms engaged a local irrigation equipment supplier in Oxnard, California, to design and install a new Xylem variable frequency drive (VFD) solution that could easily handle the field elevation changes.

VFDs for well pumps and boosters are an ideal drought-fighting solution for systems with multiple irrigation blocks, overpressurization leakage and slow flow rate. And because VFDs deliver the exact pressure and flow for different applications at different times, they help irrigate more efficiently, use less water and energy, and extend the life of the irrigation system.

With the installation of the Aquavar IPC, **Eat Sweet Farms has successfully optimized its pump operations and reduced energy costs by 43%.**



ABOUT 80% OF CALIFORNIA'S WATER GOES TO AGRICULTURE.

Source: California Department of Water Resources

SOUTHWEST SCOTTSDALE, ARIZONA

Arizona is in the midst of a historic water shortage. Ongoing drought, climate change and over-allocation of the Colorado River system has placed increasing pressure on the state's water supplies. In August 2021, the federal government declared a Tier 1 water shortage on the Colorado River, resulting in water use reductions.



REALIZING COST SAVINGS, SELF-SUFFICIENCY AND INDEPENDENCE

Sitting on 10 acres in Scottsdale, Arizona, Hunkapi Farms is home to a therapeutic equestrian program that serves a wide range of adults and children with emotional, cognitive and physical challenges.

In November 2020, the farm broke ground on a new covered arena to help increase the therapeutic riding program's outreach by 25%. But the addition caused a strain on the farm's existing well water system.

"We didn't have enough water pressure and that was causing a drain on our system," said Toby Block, president, Hunkapi Farms board of directors.

The low water pressure meant the farm had to tap into city water to irrigate the property and provide water for 25 horses. As a result, Hunkapi Farm's water bill increased by a tremendous amount.

"That's money that's being taken away from the children being helped here," said Block.

Xylem and the local Bell & Gossett rep stepped in to help, designing and installing a new hydronics system to restore lost water pressure. The project was funded in part through Xylem Watermark's community grants program.

With the installation of the new hydronics system, Hunkapi Farms can now rely on its well exclusively for its water supply. No longer having to supplement from the municipal water system represents a significant costs savings for the farm.

The new hydronics system means the horses are well hydrated to do their therapeutic work.

"(The horses) are the ones opening and healing hearts here," said Terra Schaad, Hunkapi Farms founder and executive director. **"It means everything."**

[VIEW VIDEO CASE STUDY HERE](#)



**41% OF ARIZONA'S WATER
SUPPLY COMES FROM
GROUNDWATER RESOURCES.**

Source: ADWR 2020

SOUTH

SANDERSVILLE, GEORGIA

Although Georgia has a humid climate and a statewide annual rainfall of 51 inches, periodic water shortages have become a fact of life for the state's residents. According to the EPA, shortages are triggered not only by occasional droughts, but also by uncertain aquifer supplies and a dwindling number of new surface water sources available to satisfy the state's growing population.



BRINGING CLEAN WATER TO MILITARY FAMILY

When not actively deployed with the U.S. Air Force, Tom Hall runs the farm that has been in his family for five generations in Sandersville, Georgia. But in May 2022, the Hall family found themselves without running water when the existing well system collapsed. To get by, they hauled water in 5-gallon buckets and 55-gallon drums for their everyday water needs like laundry, showering and watering their livestock.

Eventually, Hall ran a hose from his mom's house next door. Concerned about overworking her well pump though, he contacted a local well and septic company. However, the only viable solution – drilling a new well – carried a \$15,000 price tag.

"I had sticker shock naturally," said Hall.

At the advice of a well company employee, Hall put in an application with Water Well Trust (WWT).

WWT executive director Margaret Martens said the organization gives priority to veterans, elderly and families with children. As a member of the Air Force, with two sons and a daughter living with him, Hall moved to the top of WWT's list.

With plans to re-deploy in August, Hall said he felt more comfortable leaving now that his family had running water again.

"When you don't have water, you're in a bad situation," said Hall. "All of this coming together; I'm thankful for it. I can't express that enough."

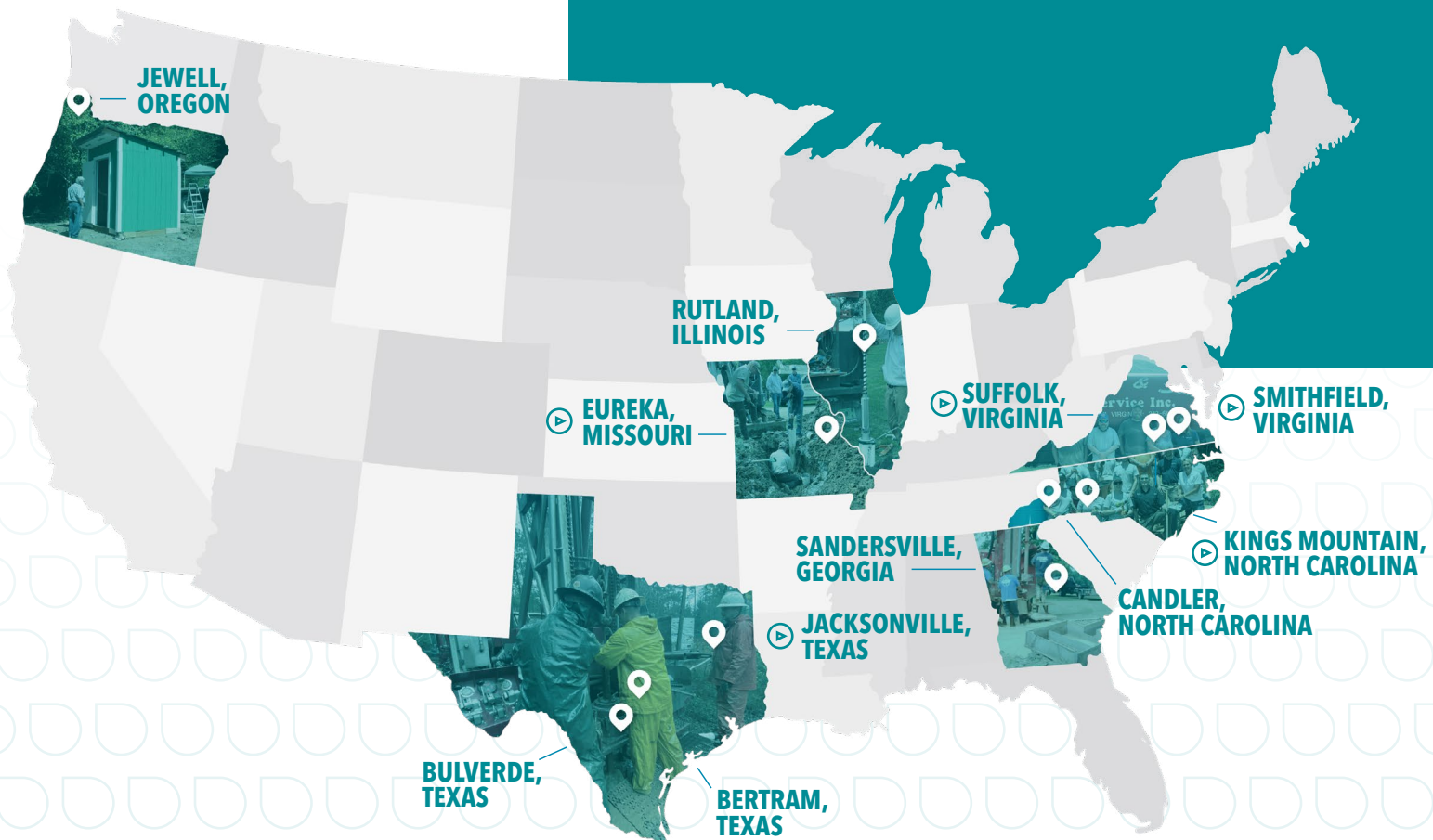


HOMETOWN H2O'S IMPACT

Since Hometown H2O began in 2020, the domestic water program resulting from the partnership between Chris Long Foundation's Waterboys Initiative, Xylem and the Water Well Trust, has helped several families around the United States.

In most cases, the cost to extend public water service to these rural properties was prohibitive for both the families and water suppliers. Typically, the families who obtained a private well through the Hometown H2O partnership realized a cost savings of 79-99% versus running public water lines to their homes.

"THE REALITY IS THAT MANY AMERICAN FAMILIES - ESPECIALLY IN RURAL AREAS - ARE FORCED TO SOURCE THEIR WATER FROM RAIN BARRELS OR OTHER UNSANITARY MEANS FOR EVERYDAY USE, AND THAT SHOULD NOT BE HAPPENING," - CHRIS LONG, RETIRED NFL PLAYER AND FOUNDER OF THE CHRIS LONG FOUNDATION.



A worker in a white hoodie and hard hat is working on a wellhead in a rural setting. The worker is holding a vertical pipe with a black and white striped section. The background shows a utility vehicle with various tools and equipment, and a house in the distance. The entire image has a blue tint.

GREATER CALL TO ACTION

While individual and small, shared wells are a cost-effective, viable option for low-income families living in rural areas, the solution is just one strategy in addressing the ongoing water crisis facing rural America. Today, solving water insecurity in rural communities means doing things differently – from technology and policy innovation to creative partnerships that build public awareness of water challenges and solutions.

PUBLIC POLICY INITIATIVES

Many of the issues associated with rural America's water supply can be traced to aging, unreliable infrastructure like leaky pipes and overwhelmed sewer systems. But essential water infrastructure remains largely invisible with few people realizing what it takes to treat and deliver drinking water every day.

When frequent handwashing was advised to help control the spread of COVID-19, the health protocol further exposed America's water infrastructure crisis and reinforced social inequities related to water access. The pandemic made it evident that prioritizing water infrastructure improvements nationwide is essential to addressing the country's growing environmental, economic and health challenges.

COVID assistance legislation like the CARES Act and historic American Rescue Plan Act delivered billions of dollars in direct, flexible federal relief to help support local governments respond, recover and rebuild from the COVID-19 pandemic.

Investments in water infrastructure have compelling economic paybacks, as well as making water more affordable and improving communities' resilience in the face of climate change. By taking a coordinated policy approach to make water systems more stable, safer, affordable, accessible, innovative and resilient, lawmakers can efficiently and effectively lay the foundation for future water security.

Major players in the water sector like Xylem are advocating to include key water projects as part of federal recovery spending. Addressing water infrastructure challenges and ensuring a safe water supply are expected to take legislative priority, building upon COVID stimulus assistance.

“Working through things like water for all – I think that’s one of the things we’re going to see from a policy perspective going forward,” says Eric Sapirstein, Xylem’s federal policy advocate and president of ENS Resources, a Washington-based consulting firm. **“How do you integrate the social needs with the environmental improvement needs? That’s what COVID as a silver lining delivered.”**

With the Infrastructure Investment and Jobs Act (IIJA) – a \$1 trillion infrastructure bill – signed into law on Nov. 19, 2021, there is the opportunity of a lifetime to highlight water's essential role in America's infrastructure and champion solutions that benefit every American. The bill provides an estimated \$66 billion to upgrade water infrastructure, including the replacement of lead service lines and pipes so communities have access to clean drinking water.

IIJA highlights:

- **\$125 million** over the next five years for the Alternative Source Water Pilot Program
- **\$23.4 billion** over the next five years for Clean Water State Revolving Fund (SRF) and Drinking Water SRF
- **\$1 billion** in grants through the Clean Water SRF to address emerging contaminants
- **\$2 billion for regional water quality initiatives** in grants through the Drinking Water SRF to address PFAS chemicals in drinking water
- **\$2 billion** for regional water quality initiatives

PUBLIC POLICY INITIATIVES

Once-in-a-generation legislation like the Infrastructure Investment and Jobs Act delivers transformative investment in transportation, broadband and water to communities nationwide, while creating millions of jobs.

The **Infrastructure Investment and Jobs Act** includes approximately \$23.4 billion in grants over five years for improvements in safe drinking water and sanitation. The legislation also devotes an additional \$15 billion for projects to replace lead water pipes and service lines. Another \$9 billion is allocated to helping drinking water and wastewater systems address emerging contaminants like PFAS.

Leading water companies like Xylem and water and wastewater agencies and associations are also asking government to prioritize measures that would encourage and facilitate the adoption and deployment of smart water technologies to rebuild water infrastructure investments for the 21st century.

INFRASTRUCTURE INVESTMENT AND JOBS ACT

INCLUDES GRANT PROGRAM TO MODERNIZE WATER
QUALITY INFRASTRUCTURE

DEVOTES

\$48.4 BILLION

WOULD INVEST

\$23.4 BILLION

IN DRINKING WATER STATE REVOLVING
FUND AND OTHER PROGRAMS

SMART WATER TECHNOLOGIES

As rural communities around the United States face increasing challenges related to limited water access and poor water quality, the water industry is developing smart water solutions to address these issues.

“Only smart water technology can solve how utilities address water affordability and scarcity,” said Xylem CEO Patrick Decker.

Many utilities across the country have already started to adopt smart water technologies, driven by the need to mitigate water scarcity, improve operations and meet regulations more efficiently.

Smart water technology ranges from intelligent equipment to smart networks to digital solutions. These three components enable water utilities to find out exactly what

is happening in their systems. They also enable utilities to shift resources from expensive emergency interventions – such as infrastructure repairs and water quality alerts – to data-driven, preventative maintenance.

As water scarcity and water quality issues continue to plague rural communities, the market for smart water technologies is growing rapidly. Smart data on water resources promotes the sustainable management of water and enhances equity in water accessibility, which will in turn help communities secure water access for vulnerable residents.

XYLEM'S SMART TECHNOLOGY

Here's a snapshot of Xylem technology currently in the market:

INTELLIGENT EQUIPMENT

Intelligent equipment includes pumps, mixers, treatment technologies and sensors that can self-optimize to improve performance. This enables water managers to decrease the time and effort needed to monitor and maintain their equipment.

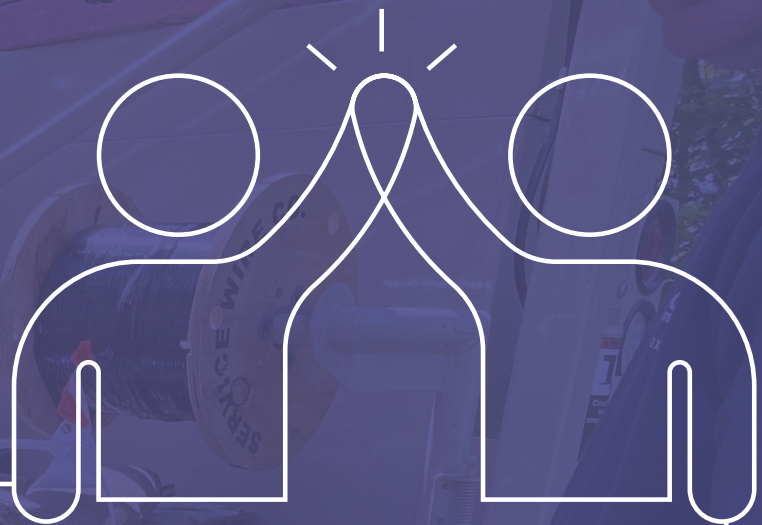
Xylem has developed intelligent sensors and monitoring equipment to identify leaks in aging pipes that result in costly, nonrevenue water losses. The company's smart metering and advanced infrastructure analytics technology can identify infrastructure problems early, across multiple pieces of equipment or an entire network, enabling water managers to continuously monitor operations and equipment.

SMART NETWORKS

Smart networks collect information across several pieces of equipment to provide real-time, reactive management of the system. This enables water managers to remotely and continuously monitor operations.

DIGITAL SOLUTIONS

Digital solutions combine real-time data from equipment with algorithms to provide proactive management of the system. This enables water managers to conduct predictive maintenance, prevent sewage and stormwater overflows, and review asset conditions.



THE NEED FOR COLLABORATION

Given the complex challenges of water scarcity, affordability and resilience, deep collaboration across the highly fragmented water sector is essential.

In June 2022, Xylem launched the Reservoir Center for Water Solutions in Washington, with the goal of bringing together like-minded policy makers, think tanks, utility associations, foundations and academic institutions in a unique, shared space to advance solutions to today's most challenging water issues.

Reservoir creates a platform for collaboration across the water sector with gathering space, public events, outreach and educational activities, all designed to build a shared vision for the future of the water sector.

"This kind of cooperation is essential to solving the world's biggest water affordability, quality and resilience challenges and enabling a more water-secure, sustainable future," Decker says.

Going forward, Reservoir will host public events, outreach and educational activities. It will also house a digital experience center equipped with the latest technologies, allowing customers and partners to learn about and collaborate on challenges and solutions across the entire water cycle.

PUBLIC AWARENESS

The problem of water hardships in the United States remains largely unseen. There aren't enough people in the United States who understand the consequences related to domestic water insecurity, and even fewer who know the issue exists at all. Safe drinking water and sanitary waste disposal systems are vital not only to public health, but also to the economic vitality of rural America.

Information and education plays an essential role in growing residents' knowledge about where their water comes from and what it takes to deliver reliable water service. As such, utilities, nonprofits and companies involved in the water sector need to effectively communicate the importance of safe, reliable drinking water for rural communities through outreach campaigns and community engagement activities.

Living in one of the most prosperous countries in the world, it's easy to overlook the water hardships happening in our own backyard. For that reason, community awareness initiatives are key to facilitating a greater understanding of the water challenges that rural Americans face daily. Bringing attention to the issue of water inequality in the United States is essential to drive meaningful action to address this ongoing crisis.

Ultimately, ensuring safe drinking water for rural communities will require a combination of solutions, from federal funding for water infrastructure projects,

to investments in new technologies, to a combination of public-private partnerships to bring private and community water systems to the most isolated rural residents.

Guided by strategic pillars that include facilitating community outreach and hosting programs that drive action in the water sector, The Reservoir Center for Water Solutions, along with affiliate partners, is poised to advance the water sector's work to overcome critical water and sustainability challenges.

"When you look at the skill sets and resources that this group of partners brings to the table you realize that together we can - and we will - make significant and sustainable progress," Maya Sathyanadhan, program manager for the Reservoir Center.

As water challenges intensify around the globe, there has never been a more promising or more urgent time to act. In the United States alone, we are seeing historic drought and flooding, lack of access to clean water and sanitation, and disparities in water affordability and equity. At the same time, investment in water infrastructure and bold new technologies are offering unprecedented opportunities to solve water like never before. Now is the time for us to come together and take decisive action.

