

RCAP

RURAL MATTERS

The magazine of the Rural Community Assistance Partnership

the importance of **Wastewater** *maintenance*



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ceo letter

Rural America faces significant challenges in managing wastewater, impacting public health and the environment. The combination of poor regulation of agricultural waste, shrinking populations, and aging infrastructure contributes to water quality violations in small community water systems across rural areas. About 79% of centralized wastewater systems are small and grapple with limited technical, managerial, and financial (TMF) capacity, often leading to Clean Water Act (CWA) compliance issues. More than 20% of US households use individual onsite/septic systems to treat wastewater. These systems can be poorly designed, installed, operated, and/or maintained, resulting in water quality and public health concerns.

A lack of government funding exacerbates the crisis, with outdated systems needing costly upgrades. The EPA estimates that updating rural wastewater infrastructure requires substantial investment. However, the funding source remains uncertain, as economic changes and demographic shifts challenge traditional payment models, and current federal funding for water infrastructure projects falls short of addressing the escalating wastewater in rural America.

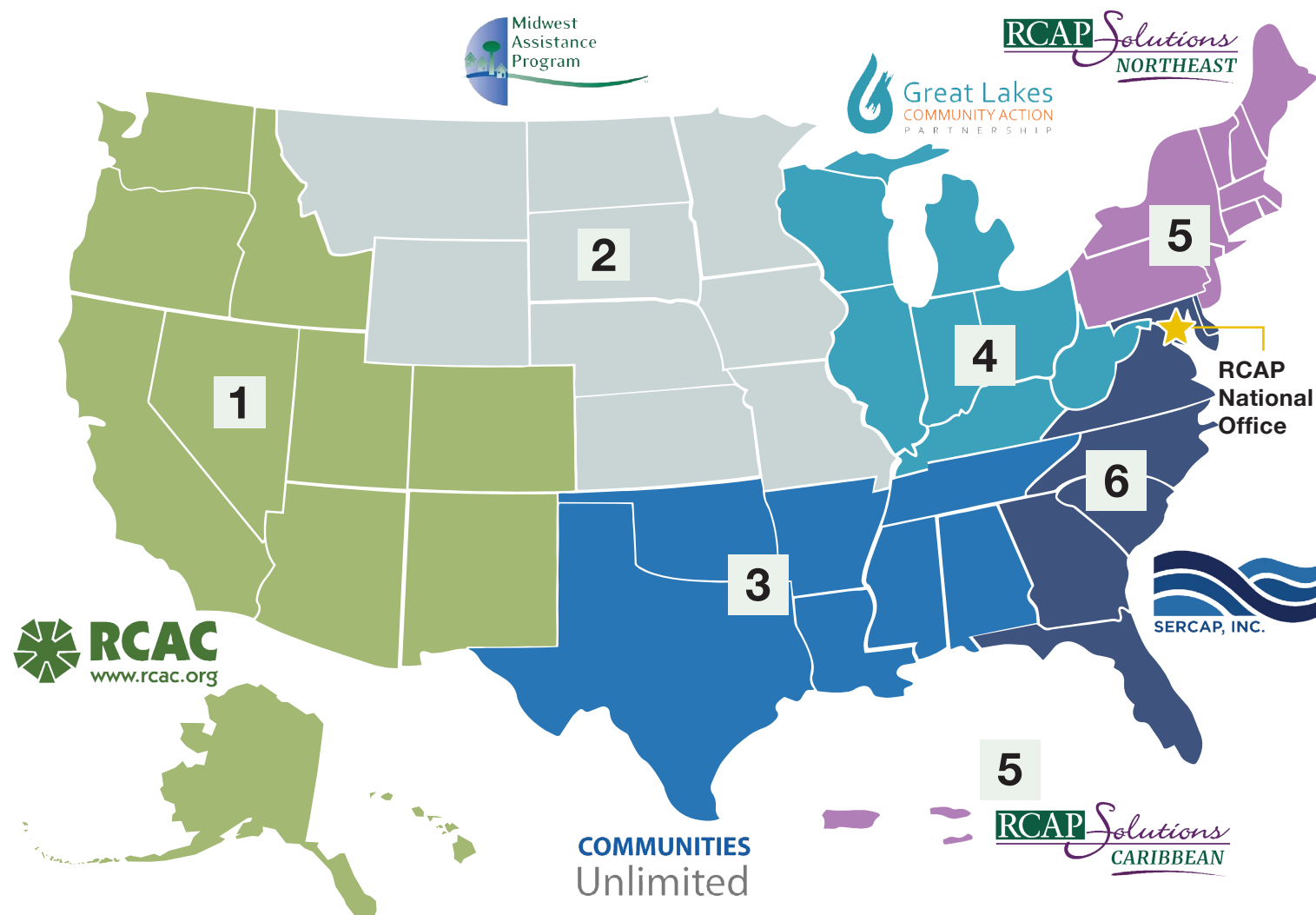
Moreover, finding qualified operators for wastewater treatment is a struggle in many rural areas. The need for trained personnel highlights the complexity of maintaining water and environmental quality in these regions.

As you will read in this issue, RCAP is helping communities across the nation overcome wastewater challenges of many kinds. Whether helping a small Idaho town settle on the proper rate structure or ensuring that the 500,000 people living in unincorporated “colonia” communities along the U.S.–Mexico border have access to basic waste disposal services, our network of TAPs is hard at work.

An approach near and dear to my heart is regionalization, which offers a more community-oriented approach through utility collaboration which is often more cost effective and sustainable. I was proud to work with RCAP, the western RCAP, to pass water regionalization legislation in New Mexico last year. RCAP will continue to assist communities interested in this solution, especially as wastewater becomes more complicated and expensive to treat before releasing back into the environment.

Rural America’s wastewater challenges demand urgent attention and substantial investment to safeguard public health and environmental sustainability. RCAP remains committed to taking a comprehensive approach to assisting these communities and in advocating that the federal government considers the unique barriers faced by rural communities and ensures equitable access to clean water for all residents.

Olga Morales-Pate
Chief Executive Officer, RCAP



Rural Community Assistance Partnership

The Rural Community Assistance Partnership (RCAP) is a national network of nonprofit partners with over 350 technical assistance providers across the country. RCAP works to improve the quality of life in rural America starting at the tap.

1. Western RCAP

Rural Community Assistance Corporation (RCAC)
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rcac.org

2. Midwestern RCAP

Midwest Assistance Program (MAP)
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map-inc.org

3. Southern RCAP

Communities Unlimited (CU)
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4. Great Lakes RCAP

Great Lakes Community Action Partnership (GLCAP)
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6. Southeastern RCAP

Southeast Rural Community Assistance Project (SERCAP)
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Marcus Samuelsson

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RURAL ROUND-UP

Recent wins and happenings



USDA's National Equity Summit celebrated the accomplishments of the USDA Equity Commission and reaffirmed the department's commitment to inclusivity. Led by Agriculture Secretary Tom Vilsack and Deputy Secretary Xochitl Torres Small, the Summit featured the presentation of the Equity Commission's final report and the publication of "A New Path Forward." Since its inception in February 2022, the Commission has identified systemic disparities and provided 66 actionable recommendations across various sectors. The USDA pledges to promptly implement these recommendations outlined in the updated Equity Action Plan, addressing inequities and ensuring equal access to resources in agriculture.



A bipartisan bill, H.R. 1181, was introduced to the U.S. House of Representatives in late February 2024. The proposed amendment works to reduce a backlog for National Pollutant Discharge Elimination System (NPDES) public works permits. RCAP is supportive of this legislative effort for wastewater utilities and local governments in good standing with their current NPDES permits.

In the over 50 years since the Clean Water Act was signed into law, public wastewater treatment plants have been working on upgrading technology and treatment standards, which have increased in expense and complication. However, permitting has not kept up with these plans. Many states are managing substantial backlogs, with some projects going through multiple permit cycles before even breaking ground. RCAP has seen firsthand the challenges to permitting and construction delays due to the current five-year renewal cycle.



TIPS

from a TAP (Technical Assistance Provider)

Luke Newey, Technical Assistance Provider, Great Lakes Community Action Partnership (GLCAP), Kentucky

As water and wastewater utilities move toward using technology for digital forms of asset management, it is essential that activities such as smoke testing are recorded electronically for future use. Collecting data on smoke testing and other maintenance and inspection activities can help operators pinpoint common locations that experience leaks or defects. The data can also be used to highlight locations that need repairs and help track repair progress. Without technology, this data would be lost with the experience of the worker who completed it. An inexpensive tool—\$0.99—that utility systems can use to begin collecting this data is Solocator. This app can be used as a first step toward a geographic information system (GIS)-based wastewater inventory. It is simply a camera that stamps each of the pictures with GPS coordinates, project names, watermarks, time, date, and other optional information such as bearing and altitude. These photos can then be exported in multiple formats for sharing or archiving. The geographical data can also be exported to a .CSV format for easy incorporation into your GIS software such as ArcGIS. Learn more about how to use technology for digital forms of asset management by scanning the QR code.



RECENT WINS and Happenings

RCAP Rural Community Assistance Partnership RCAP to Launch New National Rural Water-Wastewater Leadership Development Program

Initiative seeks to build the skills of emerging and underrepresented leaders in the water sector, particularly in rural areas that often face significant turnover and are threatened by the Silver Tsunami as experienced operators, managers, board members and administrative staff retire.

WASHINGTON, D.C. (January 5, 2023) – The Rural Community Assistance Partnership (RCAP) has been selected to lead an initiative to engage emerging leaders in the water industry at both the staff and governing board/council level to ensure that the sustainability of rural water and wastewater systems is maintained in the coming decades, and that the next generation's leaders across rural America have the skills necessary to be successful. Although rural leaders of all walks of life are welcome, RCAP will work to recruit and empower leaders who are often underrepresented in the rural water sector including women and BIPOC leaders.

A national rural leadership curriculum is being developed based on successful programs in two of RCAP's six regions and in year one will include a train the trainer workshop and will be piloted by RCAP's Western partner, the Rural Community Assistance Corporation (RCAC) and RCAP's Great Lakes partner, the Great Lakes Community Action Partnership (GLCAP). Depending on funding availability for years two and three, RCAP plans to pilot the program with each of RCAP's six regional partners, culminating in a national water leaders' forum. In the future, RCAP plans to translate the curriculum into Spanish and will also pilot it in Indian Country and ensure it is relevant for up-and-coming Tribal leadership. Participants will cultivate personal and professional leadership skills that they can use in their current, or future, roles as water utility clerks, board members, or staff. For example, participants will learn about conflict management, which is very important when planning for growth or consolidation of utilities. RCAP is experienced at training up rural water leaders across the country, mostly in more formal capacity building settings, but some of its regional partners, like RCAC, have formal programs. RCAC recently completed its second Water Leadership Institute in partnership with the Environmental Defense Fund (EDF), graduating 14 professionals from California's water-stressed Central Valley (one of many cohorts to graduate in the West under RCAC's tutelage in the last decade plus of their leadership program's existence). The first EDF and RCAC co-sponsored program previously graduated 30 participants in 2016.

"As one of the authors of the Leadership Program, it gives me great satisfaction to have this program elevated to the regional and now national level," said RCAP CEO Olga Morales-Pitt. "Sometimes the most obvious missing infrastructure in our rural communities is the human infrastructure. We need to invest in building and reinforcing that infrastructure to make sure our communities thrive, and it begins with that foundational piece – leadership development."



RCAP kicked off the Agua4All program in 2024 in South Carolina with the installation of new water bottle-filling stations with lead filtration technology at Head Start Centers in Abbeville and McCormick. RCAP's Ami Keiffer was joined by Heather Preston and Willie Morgan from Southeast Rural Community Assistance Project, Inc. (SERCAP), Julia McCusker from CoBank, and officials from GLEAMNS Human Rights Commission and the South Carolina Department of Health and Environmental Control.

In 2023, RCAP led an initiative to engage emerging leaders in the water industry at both the staff and governing board/council level to ensure that the sustainability of rural water and wastewater systems is maintained in the coming decades, and that the next generation's leaders across rural America have the skills necessary to be successful. Two pilots were conducted in Year 1 in New Mexico and Michigan and RCAP is kicking off year 2 where two bilingual (english/spanish) pilots will be held in Puerto Rico and Texas. Although rural leaders of all walks of life are welcome, RCAP will work to recruit and empower leaders from demographics that are often underrepresented in the rural water sector, including women and BIPOC leaders. You can read the full press release by scanning the QR code!



Training Calendar



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The Grace of a Proper Rate Structure

The help of federal funding and RCAC assistance restores hope in Grace, Idaho.

Elliott Bochstein, Staff Writer, Rural Community Assistance Corporation (RCAC)

Funded by EPA NPA 2 2022–2024

The City of Grace is a square-mile slice of rural Americana in Caribou County, southeastern Idaho, located about 10 miles from Soda Springs toward the border shared with Utah and Wyoming. The small town of about 950 people lies along the Bear River

in Gem Valley, a geologically rich region filled with minerals, gemstones, and verdant rolling fields of fertile volcanic soil. While Grace has many retirees, it is also a prosperous agricultural community, with bountiful grain and seed potato harvests, a robust cattle and sheep trade, and a thriving dairy sector.

In fair weather, Grace's black gorges, geothermal hot springs, and warm waterways draw anglers, kayakers, hunters, and sightseers from across the region. During the winter, subzero temperatures transform the area's rivers and streams into frozen ribbons bursting with delicate ice formations.



“We have deer in our backyards and elk on the highways in the fall. During the summer, I pick wild asparagus on the ditch banks. Some people from Utah recently came up and stayed at the motel. When they saw the clear and starry skies, they decided right then to buy a house here,” says Grace Mayor Jackie Barthlome. “We call this area God’s Country,” she continues. “When folks are in high school, they can’t wait to leave home and go someplace else, but now they’re finding out that this isn’t such a bad place to be.”

As with other towns in the region, Grace built its municipal wastewater treatment system in the 1960s. The system has not seen significant improvements since 1985, when Grace had around 1,200 residents. Besides being too large for the city’s current needs, the municipal treatment system suffers from cracked and sagging pipes, severed joints, and severe root intrusions, among other problems.

In 2021, Grace took out a \$3.2 million loan with principal forgiveness to revamp the treatment plant’s electrical system and solids dewatering process, install several new maintenance holes, and replace 2,000 feet of new collection piping. From day one, the city was concerned about its ability to meet its obligations.

“We went to bond and knew it was a big project,” Barthlome explains. “At the time, we hoped to keep rates to about \$20 a month because we’re a small community with lots of elderly people on fixed incomes.” Such hopes proved unrealistic as pandemic-induced inflation and booming construction costs made cost overruns all but inevitable.

In 2022, the U.S. Department of Agriculture Rural Development (USDA-RD) contacted the Rural Community Assistance Corporation (RCAC) to request that it assist

Grace in determining an appropriate rate structure to ensure the city could repay its loan without burdening residents. RCAC technical assistance provider Jeremy Peirsol arrived in Grace to inspect the plant’s construction upgrades and discuss the city’s needs with local leadership.

“We sat down side-by-side with the mayor, clerk, and operator to review and complete valuations for its customers and system assets,” Peirsol says. “Local leadership has been very proactive in working with their elected representatives while communicating needs and expectations with constituents.”

RCAC’s guidance quickly gained appreciation. “I’ve only been mayor for eight years, so I didn’t know what this rate study was; I just wanted to make sure we had enough to make our bond payment and have extra revenue for operating costs and other expenses,” Barthlome explains. “It was all new to me when we sat down with Jeremy the first time, but he was very, very helpful.”

Peirsol’s analysis initially recommended the city raise rates to \$42 a month; within five years, this would swell to \$70, an eye-watering sum for a mostly fixed-income community. The rate hike proposal shocked the mayor, and she wondered, “People are already struggling now, but how would they pay for this?” Fortunately, Grace’s plight didn’t go unnoticed in Washington, D.C. On December 29, 2022, President Biden signed the Fiscal Year 2023 Omnibus package into law, which included \$2.56 million in Environmental Protection Agency (EPA) State and Tribal Assistance Grants (STAG) funds through Community Project Funding to improve Grace’s wastewater collection and treatment systems. Idaho Congressman Mike Simpson’s office played a vital role in securing the funding, along with the city’s own relentless advocacy.

Peirsol provided Grace with updated rate adjustment options that incorporated the newly available federal funds and were decidedly more palatable to residents and easier on their pocketbooks. The project still faces financial challenges, but city officials remain cautiously optimistic. “When Jeremy did the first rate study, we were looking at going up to around \$70 in five years, but we’re looking at about \$50 with this new grant,” Barthlome said. “I’d say we’re sitting pretty good!”



Getting to Yes

Changing circumstances can open opportunities for small communities considering new wastewater systems.

Candace Balmer, Regional Director (NY/NJ/PA), RCAP Solutions

Funded by US EPA Treatment Works 2022–2023

Over the more than two decades that I have been a technical assistance provider in rural New York, it is not all that often that I work with a community that is exploring the feasibility and affordability of constructing a new sewer system in an unserved area. This may be because, as I have been known to say, the easy ones have already been done. Small, low-income, and often remote rural communities face particularly daunting challenges.

An urgent need for municipal wastewater collection and treatment is more often associated with larger, more densely populated areas. Not only are the potential public health impacts from reliance on individual septic systems more likely to surface—sometimes literally—in a more densely developed area, but, because there are more users per unit of space, these communities may be better able to afford the annual cost of sewer service by spreading fixed costs over more users.

Many small rural centers that are still unserved by municipal sewers have already explored the feasibility of a system before and may have even conducted that exploration more than once over the years. Often, either the project was defeated in a public vote or the proposal never even made it to a vote. Some typical reasons for this lack of community support are cost, a fear of unchecked development, a sense that a system is not needed, and a strong sense of self-reliance.

So it is unusual to find myself, as I did this year, assisting five municipalities in completely unrelated geographical areas with planning and funding for new municipal wastewater collection and treatment systems. These projects are in various stages of development.

One community formed a sewer district over 12 years ago, but, after the final costs were determined, even though a generous funding package had been lined up, residents voted the project down. Town leaders are now trying to resurrect the project with the expectation and hope that residents will be more receptive this time around. This is largely related to a perceived demographic shift from an older to a younger population in the downtown area, who they believe will be more likely to favor sewer service. The town has gathered a group of advisors, including the county planning agency, regional advocates, and RCAP Solutions, to help move the project forward. RCAP Solutions is helping them design a community needs survey to involve residents and businesses, collect information, document support, and identify concerns and objections.

Another town is seeking to serve a small hamlet by connecting it to the neighboring village's existing wastewater treatment plant. The town is still in the funding application stage and has not yet legally formed a sewer district. It is proceeding with high hopes of accessing funding as a result of additional monies that have become available over the past several years. For example, New York's Water Infrastructure Improvement Act grant program, the federal Bipartisan Infrastructure Law, and the Community Project Funding request process through congressional offices are all relatively new resources for project funding, especially funding that includes significant subsidy versus just loan dollars. RCAP Solutions is helping both of these communities to conduct and complete an income survey as one of the first steps in assessing and documenting eligibility for multiple funding programs.

RCAP Solutions helped a third community document eligibility for multiple infrastructure funding programs and assisted it in securing a USDA planning grant to complete a Preliminary Engineering Report (PER). The PER is required for many funding applications and describes the need or problem,

alternative strategies for addressing that need, associated costs, and the recommended solution. The PER also provides the estimated project budget and a breakdown of costs for the recommended solution. Once the PER is completed by its engineer, the town will need to go through the legal district formation process before moving forward with the project's design and construction. Upon completion of the PER, RCAP Solutions expects to help the town complete funding applications.

The last two communities are in the early stages of project development to provide wastewater service to their small hamlets. One already has a public water system, and the other does not. The community with the water system has clay soils that do not drain very well and is plagued by numerous substandard septic systems. People routinely see and smell evidence of failing septic systems in the ditches and storm drains. In addition to public health concerns, community leaders worry that existing conditions discourage commercial and residential development.

The community with no existing water system is concerned that its septic systems are contaminating its individual groundwater wells. High groundwater levels in the area suggest that the septic systems are probably unable to provide sufficient vertical separation from the water table for the system to effectively treat the wastewater and prevent contamination. This community is also eager to attract commercial and residential development. Because it is located at the crossroads of a federal and a state highway, its residents feel that a municipal sewer system will attract businesses and also help facilitate plans for constructing affordable housing.

RCAP Solutions is helping these last two communities through the process of hiring an engineering firm to complete the PER. To use federal or New York state infrastructure funds to pay for engineering services, the community must hire the engineer through a formal search process in which it seeks and evaluates firms based on each firm's qualifications and experience. This involves advertising a Request for Qualifications, or RFQ, to generate proposals from interested engineering firms. RCAP Solutions is helping the communities to craft the language of its RFQs to express its specific and individual needs and priorities and to generate proposals that adequately describe and reflect the qualifications and capabilities of the proposing engineering firms and their staff. RCAP Solutions is also helping the community leaders to tailor their strategy for interviewing, evaluating, and ranking the firms based on their needs and priorities.

Together, these projects illustrate the following critical elements of project development and some of the ways RCAP Solutions can help facilitate what may be largely unfamiliar tasks that the community must take on:

Promoting Community Involvement and Documenting Support for the Proposed Project

Not only is it critical to involve residents, businesses, and property owners in planning activities, but funding applications are more competitive when the applicant can document outreach efforts and evidence of widespread community support.

Having a Working Group of Advisors and Volunteers

One of the most important resources that a small community can tap into is the collective skill and expertise of people in the community and the variety of perspectives and contacts they can bring to a project. The community also needs project supporters and volunteers to take on some of the many tasks and to maintain continuity over the long-term—it is common for a successful project to take several years to get to that first flush. The community also will want to reach out to outside agencies and advisors to be sure their project and procedures meet technical, regulatory, and financial requirements. These can be community development organizations, municipal associations, state and local agency representatives, regulators, financial advisors, and technical assistance providers, among others.

Conducting a Community Needs Assessment

This process formally explores public opinion and data on things like community needs, existing conditions, and the concerns, priorities, and objections of residents and property owners in the proposed service area. Typically, it is conducted in a questionnaire format and can be tailored to the community and project. Generally, a public meeting or series of meetings is held to present a summary of the findings and further explore the needs and concerns of stakeholders. Community leaders and project supporters have a lot to gain by

obtaining and incorporating community feedback into the planning process. By being inclusive, they can bring supporters and detractors alike to the table. They can ensure that accurate information is reaching the public, and they can make sure that project plans meet the needs of, and are supported by, a majority of the people and voters in the proposed service area.

Documenting Income Eligibility

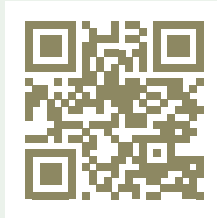
An income survey of residents in a proposed service area may be required by funders to determine and document a project's income eligibility for low-interest loans and grants. This may be the case when the project will serve a smaller subset of a larger community or when a community perceives that Census or other data on economic characteristics may not be representative of the incomes of the proposed service area. This can be a challenging task for a community to undertake on its own. Some funding agencies require that the survey be overseen by a third party. In New York and elsewhere, RCAP Solutions is a well-respected third-party guide and partner in this process.

Completing the PER

Some communities seeking to construct municipal systems may have commissioned feasibility studies or PERs in the past, but a recent PER provides the community with the most up-to-date summary of boundaries of the proposed service area, selection of collection system type, choice of treatment processes, conceptual system layout, and a more current cost estimate. USDA and other funders have guidance documents spelling out the elements and content of an acceptable PER, the heart of which is an exploration of multiple, or alternative, options. The "do nothing alternative" should always be included among the options. The proposed solution—the recommended alternative—must include an evaluation and justification for why this option is the best choice in the opinion of the engineering firm and therefore is recommended. The guidance

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may include a requirement on the maximum age of a study, particularly with respect to cost estimates, to ensure that the budget is realistic. Often, the PER is partnered with the completion of an Environmental Review and Report on potential environmental impacts and possible mitigation or remediation activities that may be required. Together, these documents are fundamental to the planning process and are the foundation upon which funding and other subsequent decisions are made.

Procuring Professional Services

The selection of the engineering firm can be a critical decision for the success of a project. Often, the community will retain the same engineering firm that completed the PER to also complete the eventual detailed project design and provide engineering services during construction. For small rural communities, it is not always a given that engineers are well-versed in and supportive of small-system alternative designs and technologies that may be more sustainable and cost-effective for the service area. It is important that the community is comfortable expressing and communicating its specific needs and that the selected firm is able to listen, understand, and address those needs through a place-specific, sustainable, and cost-effective design. This is also a key area where RCAP Solutions TA providers can help educate and advocate for the community. The RFQ process is designed to ensure that the communities will evaluate competing engineering firms based on their qualifications and not only on price.

Establishing Legal Authority

The mechanisms for establishing legal authority to levy charges for community water or wastewater services vary from state to state, but they represent a critical step in implementing an infrastructure project. Since forming a legal entity to provide water or wastewater service is not something a small community does regularly, community leaders may never have gone through the process before. The process can be challenging for those unfamiliar with it, and ensuring adherence to the legal requirements is essential. Special district formation proceedings also may be the first time that the estimated project cost to the typical household is publicized. Some municipalities may already have the legal authority to provide wastewater services, but a resolution to take on debt is still subject to a vote. This can present a challenge when special district formation or a bond resolution takes place before the funding is lined up, because, at that time, the community doesn't necessarily have an accurate estimate of cost to the typical household. Some funders require the community to bond for the entire project cost in order to complete the application. In this event, a municipality may pass a local resolution stating that it will not proceed with the project unless the cost to the typical household can be brought down to a specific amount through outside funding.

Completing Funding Applications

Most small, low-income, rural communities do not have the funds available up front to design and construct a municipal wastewater system. Technical assistance providers routinely help communities secure state and federal low-interest loans and grants as well as funding from other sources. It often takes co-funding from several sources to make a project of this magnitude affordable to users.

Scan here to
learn more
about PERs.





Challenges and Opportunities

Each of these New York communities is at a different stage in the process, with different community priorities and resources. What are the challenges and opportunities that each of them is facing? In each of the cases above, probably the biggest potential impediment to success is cost. These are small, low-income, rural communities that are rightly concerned that a majority of property owners—eligible voters and ultimate rate-payers—may not want to, or cannot afford to, pay the annual cost of a centralized system. Some of the elements that drive community support or lack thereof are:

Current Cost of Their Septic System

Many property owners do little or nothing to their septic systems unless they have an operational issue too big to ignore—they do not have the system inspected or pump, repair, or replace the septic tank or distribution box, nor do they determine whether their leach field is compromised or even take action when there are clear indications that untreated wastewater is surfacing on their, or a neighboring, property. Thus, their annual cost may be minimal. Out of sight, out of mind. Other property owners may have experienced complete system failure, or significantly increased their water usage by increasing the size of their home or in other ways, and had no choice but to replace or upgrade their septic system. These owners are even less inclined now to abandon that system and their investment and begin paying for a centralized community system.

Total Project Cost

People often suffer sticker shock at the cost of a new wastewater collection and treatment system. It is not uncommon for very small rural communities in New York to see total cost estimates of \$10–\$20 million or more. Although programs are available to offset costs in the form of low-interest, longer-term loans or outright grants/principal forgiveness, there is a limit to the amount of money available in an infrastructure funding program and how much each funder is willing to contribute. This does not include annual operation and maintenance (O&M) costs—this is just capital outlay. Funding programs currently do not help pay the cost of ongoing O&M.

Funding Limitations

Community leaders and project advocates must have a realistic understanding of the concept of a target affordability threshold. In New York and elsewhere, the typical funding programs will contribute only enough money to help bring the user cost down to a particular level and no less. That is what I call the “target affordability threshold.” Even with an excellent funding package, the estimated cost may be much higher than anticipated or unaffordable for a large percentage of proposed system beneficiaries, especially in low- and fixed-income communities.

Most infrastructure funding programs consider the financial impact of a project’s cost on proposed system users when making their funding determinations. Funding agencies and programs often use income thresholds to determine income eligibility for their programs. They may also further hone in on affordability by sizing their awards to bring the cost for a typical household to a target affordability threshold, but no lower.

For example, it is not unusual to see a funder’s affordability index equal to, say, 1.5% of the Median Household Income (MHI) of the community or service area. If the MHI is \$50,000, then, in this scenario, the typical household can afford an annual cost of \$750 (1.5% x 50,000). The funding agency or agencies will collectively contribute only enough grant money to bring the annual cost per typical household down to \$750, but no lower. They also may not have enough funds in their own program allotments to bring the cost per household down enough to reach the target.

Preconceived Expectations

Community leaders often enter the process with some idea of how much money they think property owners, and residential property owners in particular, will be willing to pay per year for a system. They have an annual household charge in mind, and they may ultimately find it is unrealistic. Either:

- It is lower than the funding agency’s target affordability threshold, or
- The project cost estimate is so high that, after taking the funding offers into consideration, the estimated annual household charge is still well over what even the funding agencies consider affordable.

That is, in either case, they do not have enough money to bring the cost down to what they consider affordable. What are a community’s options?

- Abandon the project. Many communities do just that, either before or after the next option.
- Revise their estimate of how much community members may be willing to pay and proceed to a vote. In this case, the project may be supported by enough voters to approve the required debt, but, if the cost is very high, they may also run the risk of driving out those people who literally cannot afford the annual charges.
- Seek ways to reduce both construction and operation and maintenance costs. In theory, the engineer has done this from the beginning, but that is not always the case. Many communities resist paying their engineer in order to literally go back to the drawing board or to hire a different engineering firm that may have a more cost-effective plan.
- Consider alternate ways of addressing their community wastewater challenges that may not involve construction of a centralized sewer system and treatment facility—regional or decentralized solutions, for example.

Decentralized Wastewater Collection and Treatment Opportunities

While promising for some very small communities and situations, decentralized alternatives are not often the first choice for engineers or community leaders. Engineers may be focused on large-system solutions that, while tried and true, may not provide the flexibility or operational ease of other small-system technologies and decentralized strategies. Community members themselves also resist looking at alternatives to centralized sewer services. They are not necessarily interested in options such as septic management districts (responsible management entities) or other decentralized treatment strategies. They don’t see a future for their small community without sewer. They believe that having sewer service will facilitate growth and that, without it, growth cannot be achieved. Often, by growth, what they really mean is more storefronts. Although some communities have successful storefronts, what community and commerce really look like in the 21st century remains to be seen. There is no doubt that many communities that have perceived a need to address inadequate and substandard septic systems persist in doing nothing for years on end rather than seriously exploring other options in the face of an unaffordable centralized sewer system.

The challenges that small, low-income, rural communities face in trying to provide centralized wastewater treatment services can be formidable and discouraging. However, I am optimistic that the communities I am working with may be able to successfully develop centralized projects. They are in the early stages, but they recognize and are taking advantage of their own unique strengths. They may already have an existing business district with multi-family housing that the community recognizes is stunted by lack of adequate wastewater treatment and thus have strong support. Their community character may have shifted over time to allow for less resistance to a community wastewater project. Funding opportunities may have expanded enough to allow the project to become more affordable. Their business and community leaders and residents may be increasingly committed to supporting re-development of what they perceive to be a dying town. They may be committed to preparing for a future in which their children do not need to move away for work or to buy a home. And together, they may have the energy and long-term vision to inspire and sustain the momentum on the long road to developing a community wastewater collection and treatment system. I am pleased to be able to assist them through RCAP Solutions’ technical assistance programs to understand and complete the tasks needed to move their visions forward.



Plugging the Leaks

Communities Unlimited helps resolve infiltration and inflow issues in Boynton, Oklahoma.

Lucas Guinn, Community Environmental Management Advisor,
Communities Unlimited (CU)

Funded by EPA Treatment Works 2022–2023

The small town of Boynton, Oklahoma, is about 17 miles from Muskogee. The town was built in 1903 and named after E.L. Boynton, chief engineer of the Missouri Coal and Railroad Company. Through the years, Boynton has declined in industry jobs and population due to the drought from the Great Depression era. However, some residents have remained in town to continue farming and ranching.

The residents of Boynton rely on the Boynton Public Works Authority (PWA) for their sewer, water, and trash services. Boynton PWA has been in operation since 1965. Currently, Leanette Hutchinson runs the PWA while also serving as the town's mayor. Over the years, the Town of Boynton started dealing with sanitary sewer overflows (SSOs) due to inflow and infiltration (I&I) overloading its collection system during heavy rain periods. In the course of learning how to handle these issues, the PWA started working with Communities Unlimited (CU).

One problem affecting any system with a 1.5 million gallon-per-day (MGD) mechanical treatment plant or with total retention lagoons for wastewater treatment is I&I in the collection system. I&I can cause untreated capacity issues in the collection system and treatment plant. According to EPA's website, inflow is defined as "water other than sanitary wastewater that enters a sewer system from sources such as roof leaders, cellar/foundation drains, yard drains, area drains, drains from springs and swampy areas, maintenance hole covers, cross connections between storm sewers and sanitary sewers, and catch basins." EPA defines infiltration as "water other than sanitary wastewater that enters a sewer system from the ground through defective pipes, pipe joints, connections, or maintenance holes."

As a Community Environmental Management Advisor for CU, I have provided technical assistance to water and wastewater systems in Oklahoma for the past several years. During my time in Oklahoma, I have seen two total retention lagoons with dikes completely washed out due to I&I after a heavy rainfall event. In both cases, it was very detrimental and costly to the system. Other problems caused by I&I include overflows, backups, and increased treatment costs. If the collection system isn't all gravity flow and relies on lift stations to get wastewater to the treatment plant or lagoons, the need to pump the excess water will increase electric costs and increase the wear on the pumps.

As a personal anecdote, I ran a sequential batch reactor (SBR) plant in my hometown, which had a maximum capacity of .300 MGD and averaged .080 MGD on a dry day. On days where rainfall exceeded 0.25 inches, the Supervisory Control and Data Acquisition (SCADA)

system would register 1.0 MGD coming into the plant—SCADA is a computer-based system for gathering and analyzing real-time data to monitor and control equipment that deals with time-sensitive materials or events. Fortunately, the plant had three lagoons remaining from the old system for overflow. The lagoons had lift stations to pump the water back to the treatment facility during dry weather. Two times in recent history, due to historic flooding, the extra capacity of the lagoons wasn't enough, and the lagoons bypassed, causing overflows from maintenance holes in the collection system. Since the water coming into the lagoons was heavily diluted from all the rain and the lagoons were already bypassing, the system was granted permission to pump the water over the dike of the lagoon to cut down on erosion that would be caused by it simply running over. This method kept the structure's integrity from washing out completely. In Oklahoma, all bypasses must be reported to the Oklahoma Department of Environmental Quality (ODEQ) within 24 hours, and a written report must be submitted within five days. The report must include the number of gallons bypassed, the strength of the bypass, the reason for the bypass, and steps taken to prevent recurrence.

Boynton is no stranger to these issues. To help the system better handle this, the CU Environmental Team contacted the Oklahoma Rural Water Association (ORWA) to see if the Association would do a smoke test for the town. ORWA staff agreed to bring the equipment to complete the smoke test, and the town would provide the smoke candles needed to do the job. Smoke testing is one of the oldest methods for monitoring I&I and is done by forcing non-toxic smoke into the sewer system through access points, typically maintenance holes. The smoke enters all the pipes in the sewer system and comes out where there is a broken or cracked pipe, unsealed maintenance hole, stormwater cross connection, or broken or open cleanouts, to name a few places. Systems should communicate with the homeowners in the areas where smoke testing is to be conducted and ask them to pour water into the drains of all the plumbing fixtures in the house to fill the p-traps. The smoke is non-toxic, but this will minimize its entry into homes. It is also best to coordinate with the local fire



and police departments before doing a smoke test. During testing, you may see smoke coming from the weeds of an empty lot, out of the cracked pavement in a sidewalk or parking lot, and a host of other places that would leave you wondering what is happening. The ORWA smoke tested the west side of the collection system, where several significant deficiencies were found. There is a plan in place to smoke test the rest of the system in the near future.

In the fall of 2022, the ODEQ instructed the Boynton PWA to improve its system. These improvements included the replacement of the water storage tank and mixing, aeration, and air drafting of a new water tank to replace its old unhealthy tank with a new and clean tank. This project connected the 2" line fed by the Old Raw Water line to the existing 6" lines on State Highway 62. During the application process, Boynton PWA was introduced to CU's Lending Team for a loan and started working with the CU Environmental Team. The Environmental Team assisted Boynton PWA with a rate study to increase its water and sewer rates and helped it with its debt ratio. The Boynton PWA closed on its loan in September 2022.

In the future, the Boynton PWA will continue to monitor for I&I and perform a maintenance inspection. It is an excellent practice to do maintenance hole inspections after a rain event when possible. One of the best places to perform an inspection is in a maintenance hole with a brick chimney, which will allow you to see if rainwater or groundwater is entering the maintenance hole between the bricks where the old grout has weathered away over time. This will also let you look for leaks around seals on stacked precast concrete maintenance holes and around the ring and lid. Modern maintenance holes have a rubber boot connector where the pipe enters the maintenance hole, but that wasn't always the case with poured-in-place maintenance holes or brick chimney maintenance holes. In poured-in-place or brick chimney maintenance holes, the grout surrounding the pipe entering the maintenance hole wears away over time, allowing infiltration. One should check to see if the maintenance hole is above- or below-grade when doing the inspection. If applicable, get the maintenance hole's Geographic Information System (GIS) coordinates to draw and update maps. Having a budget for monitoring I&I and correcting the deficiencies found will allow for continuous upgrades to the system while cutting back on costly emergency response and overtime due to overflows and backups. As of the publishing date of this article, the CU Environmental Team continues to work with the Town of Boynton on all of its future needs.



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A large, abstract graphic featuring a circular shape with a water-like texture. The circle is divided into two main color sections: a purple/pinkish upper half and a teal/blue lower half. Overlaid on this are several concentric white circles and a square frame. Three yellow dots are positioned at the intersections of these shapes. To the right of the circle, a trail of blue dots of varying sizes extends outwards, suggesting movement or a splash. In the center, a white rectangular box contains the text "Transforming our Water Future".

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Bringing Basic Services to the Border

Texas Colonias Work with Communities Unlimited to Find Solutions

Lupita Ortega, Regionalization Project Manager, Communities Unlimited

Funded by USDA Colonias 2022–2023

According to the Texas Attorney General's Colonias Database, colonias are defined as “substandard housing developments.” These are communities often found along the U.S.–Mexico border where residents lack basic services such as drinking water, sewage treatment, electricity, and paved roads. For many people living in these areas, a “colonia” is simply a community, neighborhood, or home.

The development of Texas colonias dates back to at least the 1950s. Texas has the largest colonias population, according to the Federal Reserve Bank of Dallas, with an estimated 500,000 people living in 2,294 Texas colonias. This represents

one of the largest concentrations of poverty in the United States, because people with lower incomes often buy the lots in colonias through contracts that offer low down payments and low monthly payments, but no titles until final payments are made. Houses in colonias are usually constructed in phases by their owners and often lack basic amenities.

In order to define the term “colonias” a bit more, the United States Department of Agriculture (USDA) rates colonias on a priority system of 1 to 5 based on the risk to public health. Similarly, Texas Senate Bill 827 classifies colonias in three categories based on the risk to public health—red, yellow, and green:

- Red colonias have unpaved roads, lack access to potable water and sewage systems, and are susceptible to flooding.
- Yellow colonias may have some better conditions including potable water service with approved wastewater disposable systems; however they lack paved roads, proper drainage, and solid waste disposal pick up services.
- Green colonias have access to all of these services and pose the lowest level of risk to human health.

Colonias have purposely been written out of city plans for decades with no improvement to the necessities, despite countless initiatives launched by the State of Texas.

The conditions of colonias across the Rio Grande Valley and the entire Texas–Mexico border are unacceptable. These communities have been studied for decades, and little progress has been made on improving living conditions for Colonias residents. These conditions affect every aspect of life, both directly and indirectly. Studies show significant negative impact on students’ ability to excel in the classroom, residents’ compromised immune systems and increased susceptibility to contagious illnesses, and overall poor mental health. The Universal Declaration of Human Rights (UDHR), a document drafted by representatives with varied legal and cultural backgrounds from all regions of the world, states “everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing, and medical care.” The conditions of colonias clearly violate this standard set by the United Nations in 1948.





The RCAP Colonias Program

The Rural Community Assistance Partnership (RCAP) is pleased to be funded by the USDA Rural Utilities Service (RUS) Water and Environment Programs (WEP) to provide Technical Assistance (TA) and training to eligible water and wastewater systems through RCAP’s “Colonias” project. Colonias are unincorporated settlements in the U.S. near the Mexican border that typically has poor services and living conditions. Assistance provided by this project directly responds to the growing and immediate needs of small, rural water and wastewater systems in Colonia communities along the four-state border of Arizona, California, New Mexico, and Texas. RCAP, along with its two regional partners, Communities Unlimited and the Rural Community Assistance Corporation, is committed to continuing to build capacity in Colonias systems as they address issues such as: staff turnover and workforce challenges, demographic changes, financial constraints, growing compliance challenges, natural disasters, the impacts of climate change including drought, and the increased cost of updating and maintaining infrastructure. RCAP completed an initial analysis of the Colonias in 2015, linked here for more information: [RCAP Colonias-Phase-II-Assessment-Report_FINAL_web.pdf](https://www.rcap.org/RCAP-Colonias-Phase-II-Assessment-Report-FINAL-web.pdf)

Through the Colonias Program, RCAP:

- Assists Colonias currently lacking safe and affordable water and/or wastewater services by addressing water and wastewater needs and deficiencies through planning, developing, financing, and constructing water and wastewater infrastructure. This results in dozens of Colonias communities every year getting closer to gaining access to reliable water and wastewater services, sometimes for the first time, thus improving public and environmental health and quality of life. The growth and/or creation of new systems will provide new potential jobs for community members helping to build the water workforce pipeline and build toward the region’s economic prosperity.
- Meets with state/area USDA RD offices and interagency Colonias working groups to explain project objectives, coordinate outreach, project development, and prioritize potential projects.
- Continues to build out a pipeline of USDA Colonias 306c applicant projects (FY18, FY19, and FY20 USDA TAT Colonias funding leveraged 29 306c applications totaling about \$130 million).
- Assists with submissions of infrastructure funding planning and construction applications, including meeting Letter of Conditions and other funder requirements, completing rate studies and financial feasibility studies, preparing applicants for any future debt service, and ensuring sustainable long-term best practices in capital improvement and asset management including helping to facilitate regional solutions which is oftentimes the only viable option for Colonia communities.
- So it maintains RCAP Colonias Geodatabase in conjunction with the University of Arkansas: <https://bit.ly/3inR8Gw>.



As a national nonprofit network, RCAP works to improve the quality of life in rural America starting at the tap.

Find out more about colonias by reading our one-pager which can be found here.





The areas in which colonias are located are also prone to flooding, which makes roads inaccessible and creates areas holding stagnant water that fosters mosquito-borne illnesses and other health risks for residents. The flooding leaves behind massive amounts of mud that residents must tread through to get to the school bus in the morning, leaving students with muddy shoes and a clear indication of what side of town they came from. On the surface level, it may not seem like a big deal to indicate what side of town one is from, but it can lead to judgment from students who may not be from that area, possibly affecting one's mental health. Below is a specific example from Esquina Colonia in Cameron County, which Communities Unlimited is currently assisting.

Cameron County

Cameron County (U-17) is 140 miles south of Corpus Christi in the Rio Grande Plains region of South Texas. Named for Captain Ewen Cameron, a member of the 1842–43 Mier expedition, the county is bordered on the north by Willacy County, on the west by Hidalgo County, on the east by the Gulf of Mexico, and on the south by Mexico. The county's largest town and county seat is Brownsville, which serves as the terminus of U.S. Highways 77, 83, and 281 and the Missouri Pacific and Southern Pacific railroads. Other large communities include Harlingen, La Feria, Port Isabel, San Benito, and South Padre Island.

Cameron County covers 905 square miles with an elevation range from sea level to 60 feet. Along the eastern edge of the county, the soil is sandy and saline, with some cracking clay. The remainder of the county has brownish to reddish soils, with loamy to clayey surface layers and clayey subsoils. Vegetation along the eastern edge of the county is typical of the Gulf prairie and marsh vegetation areas, with marsh grasses, bluestems, and grama grasses predominating. The vegetation of the rest of the county is like that of the South Texas Plains area, with small trees, brush, weeds, and grasses found in abundance. Mesquite, live oak, post oak, and shrubs also grow densely in some areas. Between 41% and 50% of the county is considered prime farmland. Natural resources include oil and gas, barite, celestite, chromium, bentonite clay, fluorspar, manganese, and phosphate.

Esquina Colonia

La Esquina colonia, Spanish for corner, is located at the corner of Farm to Market Road 510, or San Jose Road, and FM 1847, or Paredes Line Road. FM 1847 south leads to Palo Alto National Historic Park and eventually to Brownsville. Travel north on FM 1847, and you will arrive at Laguna Atascosa National Wildlife Refuge. Hwy 510 east leads to South Padre Island, a popular tourist destination. The issues surrounding this colonia are not as lovely as its name. The population of 223 residents, more than 51% of whom are low to moderate income, all live in homes with on-site sewer facilities—and that was meeting their needs, until a few years ago. Excessive rainfall and flooding due to inadequate drainage have created an environmental problem, and the septic systems are failing. The residents addressed these issues with Cameron County, which then approached the city of Los Fresnos for a partnership in addressing these issues. The city agreed to install a sanitary sewer collection system, lift station, and force main to provide first-time sewer

service to the colonia residents at a cost of \$2,785,530.

The next step was for Cameron County to apply for Texas Community Development Block Grant (TxCDBG) funding on behalf of the City of Los Fresnos for Colonia Esquina's first-time wastewater connections and septic tanks decommissioning infrastructure project. The wastewater improvements cannot happen if the Esquina colonia drainage improvements are not mitigated first. After discussions, the estimated cost of the project is well above the \$500,000 TxCDBG has available for the county. A task force was then created consisting of Colonia Esquina residents, La Union Del Pueblo Entero (LUPE), the Cameron County Economic Development and Community Affairs Department, and Communities Unlimited's (CU) Environmental Services team, including South Texas Coordinator Raul Gonzalez Jr., to figure out how to move forward with the project.

A meeting took place in January 2023. Attendees included Cameron County Economic Development and Community Affairs Department, Cameron County Drainage District #4, the Texas Department of Transportation (TxDOT), the USDA-Rural Development (RD), the city of Los Fresnos, LUPE on behalf of the colonia residents, and CU. This meeting resulted in the TxDOT revealing its plans to fund the drainage project at 100%.

Having a solution to the drainage issue is positive—but the challenge of identifying additional funds still lays ahead. After a few more meetings and discussion, the county submitted a Special Evaluation Assistance for Rural Communities and Households (SEARCH) application to USDA. As of March 2024, the USDA application was approved for \$30,000. This project is proof of the possible success of folks coming together to have a conversation to address the needs of the most vulnerable of residents. All parties continue to work together to find the best solution.



SERCAP Brings Assistance and More to Clay County, North Carolina

Working to help a wonderful community in the state's Mountain Region be even better.

Tony Dvorak, North Carolina Technical Assistance Provider, Southeast Rural Community Action Project (SERCAP)

Funded by EPA Treatment Works 2022–2023

Nestled in the Mountain Region of North Carolina, in the western part of the state, lies Clay County. This area is rich in history, having been occupied by the Cherokee Nation at the time of European settlement. The primary town of Hayesville, which is served by Clay County Water and Sewer, was named after George Hayes. When Hayes was running for state representative from Cherokee County in 1860, he promised voters in the distant southeastern part of the county to help organize a new county for them—that became Clay County, established in 1861. The name came from former U.S. Secretary of State Henry Clay. The county would have to wait until after the Civil War to form a governing body, in 1868. The first county courthouse was built in 1888 and is listed on the National Register of Historic Places. The main industry was agriculture. When visiting this beautiful area, it is impossible to not observe that Clay County is bordered by the Chattahoochee National Forest, Nantahala and Hiwassee rivers, Chatuge Lake, and Nantahala National Forest. More than 11,000 people call Clay County home.

This project was part of a goal to serve the more remote areas of North Carolina—being close to Tennessee, it is far from most of the larger towns and cities in the state. The Southeast Rural Community Assistance Project (SERCAP) offered to help the water and sewer utility conduct initial inspections of the facilities—not just fact-finding, but to see if the technical assistance provider (TAP) could help improve both plants, the water distribution, and the sewer collection system. When speaking later with the Public Works director, Dusty Beal, it was also noted that some required EPA reports were going to be due. These were an AWIA (America's Water Infrastructure Act) emergency response plan and a risk and resilience/vulnerability assessment for the drinking water system so, with EPA Treatment Works funding, SERCAP also

completed these for the wastewater system at the same time. Having recently been promoted to the public works director position, Beal was very encouraged by SERCAP's offer of assistance to "get the ball rolling" and help move the county into the 21st century. Beal has been proactive and wants the best for his community. People in the area of Hayesville, which happens to be the county seat, are energetic and forward-thinking, too.

While helping Clay County with the basics, next steps were to make sure the operations staff were offered training and instruction. With new American Rescue Plan Act (ARPA) funding coming in, the town needed to address a major collection system problem in its sewer system. Inflow and infiltration was a huge problem, and Clay County needed to identify where it was coming from. The TAP, Tony Dvorak, stepped in to suggest performing a smoke test of the sewer system, which the director agreed to work on with SERCAP assistance. Smoke testing is just like it sounds: a blower set-up introduces smoke in the pipes through a manhole connection and, when the smoke reaches leaks, it appears on the surface to show where the system has been breached. Those two days of testing yielded numerous breaches that were allowing inflows.

The next step was to complete a report and present it to the county manager and staff. Recommendations were made and are currently being implemented. Another issue the TAP is assisting with is the recruiting and training of new staff, as the town is seeing significant employee turnover.

Clay County is also having extensive road work along with drainage and other excavations, which has caused numerous leaks. SERCAP has assisted in locating lines to the best of its ability. Mapping the system is an ongoing problem. Keeping the utility up to par and making improvements and repairs is eating into budgets. With all of these challenges came another opportunity for assistance from SERCAP through the North Carolina state manager, Randy Welch, who led meetings and completed a comprehensive review of costs, budgets, and other utility reports to complete a rate study. Recommendations offered may help the county understand and bring in revenue for more up-to-date costing, which should keep the system in better shape for the future. More improvements have been made through



the development of an asset management program with the help of SERCAP TAP, John Poteat, as meetings and the relationships built are yielding an effective way to educate Clay County.

Conducting an asset inventory can be difficult, and in Hayesville, the ability of Clay County to keep theirs up to date has been a challenge. SERCAP has helped the county's staff understand, especially when emergencies have arisen, that it is important to have more repair parts than needed on hand. Lately the number of line breaks has been on the increase—with no surprise, as they happen when parts are not readily available. Recommendations to revamp and inventory the parts, equipment, and other resources are ways SERCAP keeps helping the community.

In the near future, more assistance will be given on an important step: finding, locating, and identifying the assets of the sewer collection system and the town lift stations. GPS/GIS mapping has been coordinated by Tony Dvorak, and leading the team to make this happen is SERCAP's mapping expert from South Carolina, Kim Rutledge. Staff from SERCAP's Florida, Virginia, and North Carolina offices will converge for the task, as it will be a big undertaking. The first step of creating a base system map has already been completed, with informational handouts and explanations as to how SERCAP will proceed. Two to three days have been set aside to start the first layer of this GIS map. To collect data and capture sites, staff will find all of the manholes and lift stations and the exact location of the sewer plant. This mapping will be just the start, as town and county staff will be encouraged to add to the layers in the future. SERCAP has suggested mapping the pipes of the collection and water systems, including the distribution system, valves, and hydrants. This will truly help bring best management practices to Clay County and bring on the 21st century thinking that being proactive offers.

SERCAP has also hosted in-person classes with venues provided in-kind by Beal and his staff. In April 2023, operators from the region were invited to classes to help them earn North Carolina Department of Environmental Quality continuing education units for license renewals. SERCAP provides these services and will continue using Clay County as a location, due to its willingness to partner.

Clay County is continually increasing in population, and more people are moving to the beautiful town of Hayesville. The future of Clay County and Hayesville, North Carolina, looks bright, and SERCAP will be there to assist as needed.



Managing Water Supply in a Changing Climate

How rural water supply leaders are overcoming an increase in droughts and evaporation.

Julia McCusker, Managing Director, Water Rural Infrastructure, CoBank

Funded by EPA NPA 2 2022 - 2024

Most water management professionals are keenly aware that certain parts of the United States, including the West and heartland, have begun to experience more intense and frequent droughts. As of March 28, 2023, more than 25% of the U.S. is in drought, affecting almost 46 million people, according to the latest numbers from the U.S. Drought Monitor. When drought conditions occur, water supplies naturally become more fragile. Yet, droughts aren't the only cause of potable and usable freshwater instability. Evaporation is adding to the toll, too.

As one study from Texas A&M University has discovered, annual evaporation volume rates from lakes and human-made reservoirs have steadily risen for more than 35 years. Annually, lakes around the world are evaporating 58% faster volume-wise than they were in 1985. A&M researchers estimate that the amount of water lost through

the evaporation of reservoirs each year accounts for about one-fifth of the global water supply.

These findings are substantial and concerning, particularly for rural water system leaders and their residential and commercial customers. In fact, many smaller communities end up feeling a greater burden during periods of drought.

Case in point: Agribusinesses rely heavily on water to maintain healthy crops and sometimes even power machinery or

transport produce, grains, animals, and other commodities. Although they can use proven low-water landscaping strategies and apply smart, AI-driven technologies to maximize water usage, they, their crops, and their livestock can't operate efficiently if wells, reservoirs, lakes, and other water supplies dry up. Consequently, the duty falls also to water management experts to find ways to avoid water insecurity and hardship amid the reality that more droughts are apt to come due to the effects of climate change.

Although pushing for conservation among consumers can be a helpful way to stretch shrinking water supplies, it's hardly the only method that water management officials across the country are using to deal with today's and tomorrow's droughts. These are some of the solutions they're employing to stay ahead of weather shifts that may lead to droughts.

Tapping into funding streams to improve aging water systems

One major trend across rural water management utility facilities is the upgrading and repairing of aging and failing water systems. Newer systems are able to more efficiently move water with minimal loss. Less water lost means more water available for distribution to the people and communities that need it.

There are many financial solutions and options available to help utility leaders pay for system improvements. These include opening lines of credit for easier access to capital when emergencies or short-term needs arise, term project financing to extend borrowing and regulate the cost of upgrade projects, and refinancing to lower interest rates on current loans. Municipal notes and bonds can be excellent funding vehicles when available, too.

Collaboration, when it makes sense

Consolidating rural water systems takes time but can be advantageous in the right situations. Take the Iowa Lakes Regional Water (ILRW) rural water system, for instance. The ILRW serves more than 5,000 customers across 10,000 square miles. A collaboration of partners, the ILRW has proven that banding together has its benefits.

One of the ILRW's newest members, the town of Ayrshire, Iowa, was able to update its water system and thereby



reduce the town's high rate of water distribution loss—a level and type of loss that are particularly painful during droughts. These types of relationships aren't for every water system, but they are worth bringing to the table as part of the long-range planning process.

Reevaluating water storage solutions

Water storage in places like large reservoirs can minimize the impact of droughts. However, building reservoirs and other storage requires a conscientious, thoughtful approach. Reservoirs affect the surrounding ecosystem. They must therefore be evaluated from both practical and environmental perspectives to ensure they don't, in solving one problem, cause another.

Even rural communities with existing reservoirs are debating whether they need more water storage. Many reservoirs were built and designed for communities and climates that no longer exist. This puts them at risk of being antiquated and insufficient. Adding more storage can ensure they still serve as vital water infrastructure pieces without being the only freshwater resource for growing, sprawling towns.

Climatologists are clear about one thing: Droughts and drought-related water evaporation aren't going away anytime soon. With that in mind, rural water supply management teams need to take bold measures today to ensure they can continue to serve the residents and businesses that depend on them.

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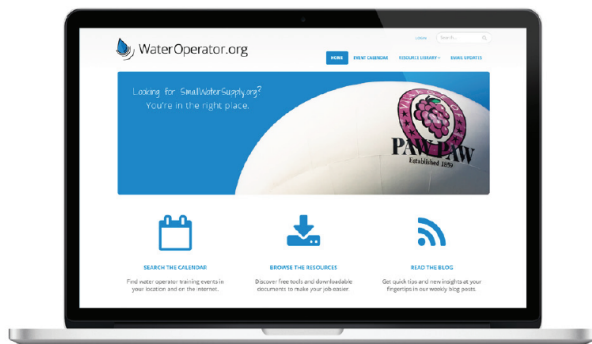
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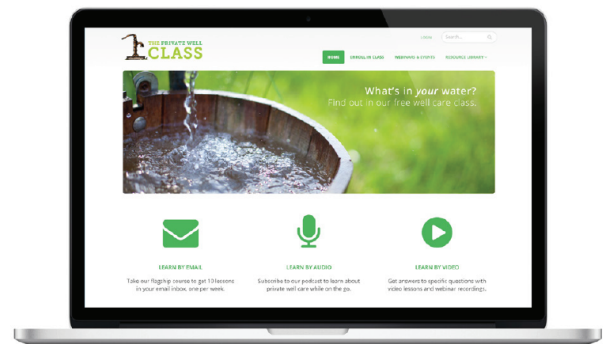
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