RCAP
Project Activity Report Out – Innovative Treatment Tech for Small Systems

Jeff Oxenford, joxenford@rcap.org
Laura Landes, llandes@rcap.org
In Fiscal Year 2021 RCAP Technical Assistance (TA) projects served:

### Impact by the Numbers

<table>
<thead>
<tr>
<th>In FY21 RCAP Served</th>
<th>In FY20 RCAP Served</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4,340,000</strong> PEOPLE</td>
<td><strong>3,400,000</strong> PEOPLE</td>
</tr>
<tr>
<td><strong>1,320,000</strong> PEOPLE OF COLOR*</td>
<td><strong>1,100,000</strong> PEOPLE OF COLOR*</td>
</tr>
<tr>
<td><strong>344,000</strong> TRIBAL MEMBERS</td>
<td><strong>292,000</strong> TRIBAL MEMBERS</td>
</tr>
<tr>
<td><strong>1,130,000</strong> LOW INCOME INDIVIDUALS</td>
<td><strong>950,000</strong> LOW INCOME INDIVIDUALS</td>
</tr>
<tr>
<td>or people with an individual income below $13,000 per year</td>
<td></td>
</tr>
<tr>
<td><strong>457</strong> WELL ASSESSMENTS PERFORMED</td>
<td><strong>288</strong> WELL ASSESSMENTS PERFORMED</td>
</tr>
<tr>
<td>That’s 457 households that better understand how to protect their groundwater for safe drinking water for their family.</td>
<td></td>
</tr>
</tbody>
</table>

*In the spirit of diversity, equity, and inclusion, we must understand the populations we work with and how we can do better to serve them. Though this is continuously evolving, we’ve used the term “people of color” as a currently accepted term to include (but is not limited to) people who identify as Indigenous or Alaska Native, Asian, Black, Hispanic or Latino, Middle Eastern or North African, Native Hawaiian or Pacific Islander, and/or Multiracial.*
In Fiscal Year 2021, RCAP Technical Assistance (TA) projects served:

**Impact by the Numbers** (continued)

- **Trainings**
  - Trainings: 430 (2021) vs. 490 (2020)
  - Attendees: 9,000 (2021) vs. 8,000 (2020)
  - Systems reached: 5,000 (2021) vs. 4,000 (2020)
### Map of Training/TA Completed in FY 2021

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Projects</th>
<th>Population Served</th>
<th>Communities Served</th>
<th>POC Served</th>
<th>% POC Served</th>
<th>Low Income</th>
<th>% Low Income</th>
<th>MHI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU</td>
<td>399</td>
<td>780,000</td>
<td>430</td>
<td>331,000</td>
<td>42</td>
<td>191,000</td>
<td>25</td>
<td>37,580</td>
</tr>
<tr>
<td>GLCAP</td>
<td>512</td>
<td>953,000</td>
<td>550</td>
<td>96,000</td>
<td>10</td>
<td>220,000</td>
<td>23</td>
<td>38,160</td>
</tr>
<tr>
<td>MAP</td>
<td>411</td>
<td>596,000</td>
<td>480</td>
<td>195,000</td>
<td>33</td>
<td>175,000</td>
<td>29</td>
<td>42,435</td>
</tr>
<tr>
<td>RCAC</td>
<td>331</td>
<td>857,000</td>
<td>360</td>
<td>352,000</td>
<td>41</td>
<td>249,000</td>
<td>29</td>
<td>40,530</td>
</tr>
<tr>
<td>SERCAP</td>
<td>365</td>
<td>717,000</td>
<td>390</td>
<td>261,000</td>
<td>36</td>
<td>196,000</td>
<td>27</td>
<td>35,620</td>
</tr>
</tbody>
</table>
A Snapshot of Our Communities

RCAP works with communities that few others serve and where help is most needed. In FY 2021, we served 2,503 unique communities. Those communities looked like:

- **Average Population**: 1,636
- **Average Median Household Income (MHI)**: $39,498 (which is 58% of the US national MHI)
- **% of Communities with 3,300 or Fewer Population**: 86%
RCAP’s role in this project

• Provide the perspective of small, rural communities

• Understand challenges to implementing innovative tech in those communities

• Begin to get at possible solutions
Methods

Goal: use a mixture of methods to identify rural communities and very small water systems

• SDWIS violations data
• RCAP’s technical assistance project database
• Knowledge of RCAP technical assistance providers
SDWIS/DCS methodology

SDWIS

• Accounting for lag in violations data
• Systems that were out of compliance and have returned to compliance are potential success stories
• Focus on smaller systems,
  • Very Small Systems = 0 – 500 people
  • Small systems = 501 – 3,300,
  • Medium systems = 3,301 – 10,000, and
  • Large systems = > 10,000.
• and Community Water Systems (CWSs)
SDWIS/DCS methodology

SDWIS

• Findings:

1. 17,946 systems in initial dataset
2. After cleaning, there are 16,744 systems with the first violation in 1978
3. Most common rules: Disinfectants and DPB Stages 1 and 2, Revised and Total Coliform, Arsenic, Radionuclides
4. 8,221 systems have at least 1 violation between 2015 and 2019
5. 1,802 systems have violations in 2015-2019 and 2020 or 2021
6. 7,683 systems have had at least 1 violation between 2015 and 2019 and NO violations in 2020 or 2021 for the same contaminant.
7. 1,936 systems have two or more years of violations and have population < 10,000
8. Rules with violations are: DBP Stages 1 and 2 (1,079 violations), Radionuclides (230), Groundwater Rule (200), Arsenic (196), Long term SWT Rules 1 and 2 (156)
SDWIS/DCS methodology

DCS

• Cross-reference with PWSIDs in RCAP projects
• Detailed review of project details
Additional methods

Mining the knowledge of TAPs in the RCAP network across the country
Interviews

Interviews were conducted with Technical Assistance Providers (TAPs) and communities

1. Describe the project
2. What stage of completion? (Discussion, design, implementation, completed)
3. Describe the decision process (who, issues discussed)?
4. Barriers to implementation?
   - People
   - Technology
   - Financial
   - Regulatory
Good innovation example

Change from MF to UF ceramic membranes

• Technology proven internationally for industrial treatment – 1st US application, 1st drinking water application

• Goal to reduce cost, increase capacity while maintaining same footprint

• Plant size 3 MGD to 4.8 MGD
Good example – stars align

• People
  • Innovative operator and staff
  • Great relationships and trust - Board, regulator, vendor, community

• Technology
  • Demonstrated for other industries
  • Vendor provided units – pilot on backwash line

• Financial
  • Self funded the work
  • Staff did all the testing, modifications, etc.

• Regulatory
  • Did not address compliance order
  • Operator – Proven track record of success
Good example: Outcomes

• Increased capacity, same footprint
• Serves as demo for the technology
• Trying other innovative technologies

• Operator – How to keep the board trust - “if you are going to try an innovative technology, do what you need to to make it work”
Challenging example

Homeowners association

- 12 homes, 33 people (30 homes on build out)
- Exceeded MCLs for total radium and gross alpha particles
Challenges/Solution

- **People**
  - Well changed hands 3 times – Original owner went bankrupt, new owner knew very little about the well
  - Lack of trust and support – Residents felt they were lied to. Regionalization - don’t get along with the other subdivision.

- **Technology**
  - AWWA Community Engineering Corp (CEC) and local university evaluated alternatives and developed PER
  - POU/POE solution recommended. RCAP developed maintenance agreements

- **Financial**
  - State small system compliance grant (no matching funds)
  - Created a sanitary district so they could tax themselves
Private wells

• Common problems with POU/POE
  • Ineffective from lack of maintenance
  • Reduced income = deferred maintenance
  • Not the right filter for intended purpose
• Vendors sell treatment that is ineffective or doesn’t address the problem.
• Water quality changes can have other impacts
• New technologies emerging all the time
Private Well Innovation Solutions

- Educate, educate, educate….
  - Clearinghouse for new treatment
  - NSF and WQA verification important

- Testing – Would be great to have before, after, periodic
  - Most only test before filters are installed
  - Don’t want to pay for testing

- Minimal requirements for disclosure during sale (why was this installed, when last serviced …)
Other general observations

• People
  • Vendors
    + Take roles as needed (disposal of residuals, pilot testing)
    - Great technology, but little industry experience
  + State primacy conducting outreach and training
  + Educating the clerk
  + TAPs getting the word out (i.e. WEF Autosamplers)

• Technology
  + Available test modules
  + Regional technology solutions
Other general observations

• Funding
  + Local planning grants and free TAPs!
  - Not qualifying for points on SRF application
  - Extra sampling for pilot a huge financial burden
  - Hard to get O&M money

• Regulations
  • New rules - State was learning along with the community. Other agency got involved that hadn’t work with DW utilities
  - Need clear guidance - “We need to see …”
Next steps

• Continue to collect stories, provide summaries
• Final document with common barriers and potential solutions