Drinking Water Capacity Development &
Technical Assistance Program

ADEQ Op Cert Workshop
January, 2021
Chelsey Vega
Facts about Public Water Systems

Public Water Systems by Size

74% of PWSs serve fewer than 500 persons

- 74%
- <1%
- 4%
- 5%
- 16%

1532 total PWS in Arizona (non-tribal)

- More than 100,000 persons (10)
- 10,001 – 100,000 persons (57)
- 3,301 – 10,000 persons (84)
- 501 – 3,300 persons (247)
- 15 – 500 persons (1134)
Facts about Public Water Systems

Types of Public Water Systems

- Political subdivisions (cities, towns, DWIDs, CFDs, CID) – ADEQ regulated 14%
- Active ACC regulated systems 22%
- Other (non-ACC regulated, non-political subdivision) – regulated by ADEQ 52%
- Fed/state/public school run PWSs – regulated by ADEQ 12%

1532 total public water systems
KOUI
and
Problem Solving
Application
ADEQ Mission:

“To protect and enhance public health and the environment.”
KNOWN

ONGOING

UNAUTHORIZED

IMPACTS
Governor's Scorecard

40 PWS
22,755 People
Website - http://azdeq.gov/MyCommunity
Problem Solving Tools

- Fishbone
- 5 Whys
- A-3

Tiger Team & ELT

Post Mortem
Fishbone

Policies
Statute, Rule, etc.

People
Human actions, Skills, etc.

Procedures
How it is done, SW, etc.

Measurement
How it is measured, what is measured, etc.

Environment
Physical, Cultural, Perceived

Systems
Software, Equipment, etc.

Causes

Impact of Countermeasures
- What Flow Board, Tic Sheet, Standard Work, Metric, etc. should be affected by implementing the Countermeasures?

- Make a note on the affected Flow Board, Tic Sheet, Standard Work, Metric, etc. to show connection with this artifact.

Countermeasures
Consider the Dual Countermeasure Dichotomy

1.
2.
3.
4.
5.
6.

Effect

Root Cause
## 5 Whys

**Author:** John Doe "EXAMPLE"

**Date:** December 25th, 2017

**Problem or Cause:**
The room is dark, there is no light on.

<table>
<thead>
<tr>
<th>&quot;WHY&quot;</th>
<th>Answer</th>
<th>Confirmation: (confirm each Why)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why is the room dark?</td>
<td>The lamp is not turned on.</td>
<td>Go to lamp and check if turned on.</td>
</tr>
<tr>
<td>Why is the lamp not turning on?</td>
<td>The lamp is unplugged.</td>
<td>Check if lamp is plugged in, plug in.</td>
</tr>
<tr>
<td>Why is the lamp still off after plugging in?</td>
<td>The lamp is not turned on.</td>
<td>Check if lamp turned on.</td>
</tr>
<tr>
<td>Why is the lamp still off after turning on?</td>
<td>The bulb is loose.</td>
<td>Tighten bulb.</td>
</tr>
<tr>
<td>Why is the lamp still off after tightening bulb?</td>
<td>The bulb is burned out.</td>
<td>Replace bulb, light comes on.</td>
</tr>
</tbody>
</table>

**Root Cause:**
The lamp was turned off, unplugged and had a burned out bulb.

**Countermeasure:**
Replace the lamps bulb.

**Standardize:**
Update SW to include testing of lamp when placed in room, train all individuals on SW, lamp replacement and bulb storage location.
SAN SIMON DWID has been serving drinking water above the Maximum Contaminant Level for Fluoride since January 2000.

This A3 addresses the Fluoride exceedences at San Simon DWID and does not address any other SDWA or AAC violations.

San Simon DWID will be serving water under the MCL for Fluoride by 5/1/2020.
## Problem, Scope, and Goal

<table>
<thead>
<tr>
<th>Project A3</th>
<th>Project Name:</th>
<th>San Simon DWID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. DEFINE (PLAN)</strong></td>
<td>Communicate the context of this project in the overall process or project.</td>
<td></td>
</tr>
</tbody>
</table>

**Problem Statement (what specifically is being solved):**

San Simon DWID has been serving drinking water above the Maximum Contaminant Level for Fluoride since January 2000.

**Scope (Specifically what process or bounds exist):**

This A3 addresses the Fluoride exceedences at San Simon DWID and does not address any other SDWA or AAC violations.

**Goal Statement (format specific "From X to Y by When"):**

San Simon DWID will be serving water under the MCL for Fluoride by 5/1/2020.
Post Mortem

Water System Details:
- Maricopa County (NE Mesa)
- Transient Non-Community
- Groundwater
- 125 people, 1 service connection
- 1 wells, 1 storage tank

KOUI Details:
- Pollutant: Nitrate MCL Exceedance
- Discovery Date: 06/01/2017
- Impact End Date: 12/18/2018

Actions/Resolution:
Pump to waste testing by ADEQ, nitrate levels dropped <10 after 1 hr. Owner looked into treatment through Culligan (Centralized Unit), but Maintenance costs were high. Connected to the City of Mesa as a customer, no longer a PWS

Lessons Learned/Process Improvements:
- Lessons Learned: Verify information on installation/maintenance cost for all options.
- Lessons Learned: Cheaper for the system to connect now w/ more development in the area
- Process Improvement: Connection costs to Mesa around $26,000.
What is Capacity Development?

Arizona’s effort to help drinking water systems improve their...

- Finances
- Management
- Infrastructure

... so they can provide safe drinking water consistently, reliably, and cost-effectively
Foundation of CapDev for PWS’s

**TMF**

- Source water adequacy
- Infrastructure adequacy including, treatment, distribution, storage
- Technical knowledge and implementation

**Technical**

- Ownership accountability
- Staffing and organization
- Effective external linkages

**Managerial**

**Financial**

- Revenue sufficiency
- Credit worthiness
- Fiscal management and controls
What is Technical Capacity?

- Sufficient source & supply:
  - an assured water supply or water availability from ADWR OR
  - provide documentation of adequate source capacity

- Water meets drinking water standards

- Infrastructure, treatment & storage meets ADEQ requirements

- Having a certified operator of proper grade & type

- System documentation – O&M manual, as-built plans, distribution map
What is Managerial Capacity?

- Formal organizational structure
- Documented bylaws & rules
- Emergency operations plan (EOP)
- Staff job descriptions & organizational chart
- Secure & accessible system records
- Source water protection plan
- Regular communication with customers
What is Financial Capacity?

- Does the water system have?
  - Water system budget
  - Water rates or fee structure that meets expenses
  - Capital reserve fund
  - Asset inventory
All public water systems must have “system capacity”

- Adequate capabilities in three areas:
  - Technical (T)
  - Managerial (M)
  - Financial (F)

- Ability to plan for, achieve, & maintain compliance with applicable drinking water standards and requirements

To provide safe & healthy drinking water
New Public Water Systems

- All new community and non-community/non-transient water systems must file an Elementary Business Plan (EBP) for review & approval by ADEQ.

- EBP must show how they will meet the TMF requirements.

- EBP is submitted with Approval to Construction application.

- Approval of Construction cannot be issued until/if EBP has been approved.
Existing Water Systems

- Continually working to identify systems in need and prioritize them for assistance

- Identify the factors that are causing compliance concerns

- Deploy resources to PWS to:
  - Provide training and certification
  - Provide compliance assistance
  - Encourage partnerships with other PWSs
America’s Water Infrastructure Act of 2018

- Risk & Resiliency Assessments
  - Including emergency response plans
- Grant Programs
  - Lead in schools testing
  - Lead material replacement for schools
  - WIIN
- Monitoring for unregulated contaminants
- Asset management
Asset Management is...

- Practice of managing infrastructure
  - Costs of owning and operating
- Process to repair, replace or upgrade on time infrastructure
- Centered around 5 core questions....
1. What is the current state of my assets?
2. What is my required "sustainable" level of service?
3. Which assets are critical to sustained performance?
4. What are my minimum life-cycle costs?
5. What is my best long-term funding strategy?
You’re Invited!

- Please Join Us at the next virtual session on Tuesday March 2, 2021 from 9:00 am – 12:00 pm MST; where we will:
  - Discuss reasons for financial challenges identified during our kickoff meeting in November 2020; and
  - Develop countermeasures to address them.

Please register at: https://register.gotowebinar.com/register/4381869808648642576
SRF Incentives for TMF Capacity

- WIFA cannot loan to systems that do not have adequate TMF capacity unless funding will:
  - Help the system achieve and maintain compliance
  - System will make changes in operations to ensure capacity
Common Areas of Noncompliance

- Water quality exceeding MCLs
- Poor system maintenance
- Failure to obtain services of certified operator of correct grade
- Lack of O&M and/or emergency operations plans (EOP)
- Lack of sufficient storage
Common Areas of Noncompliance

- Water treatment failure – MCL violation; disinfection by-products formation
- Use of unapproved water system materials, coatings
- Failure to obtain ATC and/or AOC
- Pipe breaks, leaks in storage tanks; lack of storage – lack of preventative maintenance
Under the capacity development program, ADEQ can provide technical assistance to small community and non-community/non-transient PWSs serving < 10,000 persons.

Provided through 3rd party contractors and/or ADEQ staff.

TA can include capital project development or capacity development needs.

http://azdeq.gov/TechnicalAssistanceProgram
Examples of Technical Assistance

- Engineering feasibility study/Preliminary Engineering Report
- Scoping studies to determine types of treatment
- Treatment design
- Environmental reviews
- ATC/AOC applications
- Prepare asset management plans
- Rate cases
- Project cost estimates
- System evaluations
- Pilot studies
- Security inspections & exercises
- Training – board, management, operator
A series of trainings developed to help PWS owners/managers understand their responsibilities & provide tools for compliance & understanding

- Basic PWS operations
- Water audits
- Budgets & finances
- Rate setting
- O&M/Emergency Operations Plans
- Asset management
- Security
Lastly, let’s talk about funding
# Funding Matrix

## Resource Matrix Version 11.0

<table>
<thead>
<tr>
<th>Organization</th>
<th>Type of Support</th>
<th>Stage of Service</th>
<th>Resources Available</th>
<th>Eligible Entities</th>
<th>Uses/Purpose</th>
<th>Eligibility Requirements</th>
<th>Agency Website &amp; Contact Person Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Development Block Grants (CDBG) - Regional Allocation - Grants</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Funding that is distributed on a non-competitive basis through the four non-metro Councils of Governments. Funds available vary based on the region's approved rotational method of distribution which also contains a multi-year schedule for how distributions will be made to all eligible communities, receive funding and can plan projects.</td>
<td>All incorporated cities and towns in the 12 rural counties (excluding Casa Grande, Douglas, Flagstaff, Prescott, Sierra Vista &amp; Yuma), all rural counties. Private water companies may be eligible as sub-recipients to the city, town or county and would have to work closely with the public entity on proposed projects.</td>
</tr>
<tr>
<td>Community Development Block Grants (CDBG) - State Special Projects - Grants</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Competitive opportunity for projects that align with State’s Consolidated Plan and are ready to implement immediately meaning that environmental reviews are completed, land control secured, planning, design and permitting complete. 100% of funds must be spent on activities that benefit low &amp; moderate income populations. Application rounds are announced via a Notice of Funding Availability.</td>
<td>All incorporated cities and towns in the 12 rural counties (excluding Casa Grande, Douglas, Flagstaff, Prescott, Sierra Vista &amp; Yuma), all rural counties. Private water companies may be eligible as sub-recipients to the city, town or county and would have to work closely with the public entity on proposed projects.</td>
</tr>
<tr>
<td>Community Development Block Grants (CDBG) - Colonias - Grants</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Set-a-side of state’s award for colonias addressing lack of basic infrastructure (potable water or sanitary sewer) or safe and sanitary housing. This funding is available every two years thru a competitive process.</td>
<td>ADOH certified colonias or applicant to submit Colony Designation &amp; Certification packet 60 days prior to application deadline.</td>
</tr>
<tr>
<td>Section 108 Loan Program</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>A portion of the CDBG funds can be turned into a federally guaranteed loan program and used to provide communities with public project financing for construction, reconstruction or installation of public facilities. Funds can be used for long term recovery or to prevent further damage if it doesn’t duplicate funding available from FEMA, S&amp;I and TE/SE. Section 108 loans can be used for FEMA match for recovery projects.</td>
<td>Metro cities and urban counties, rural cities, towns and counties (non-entitlement communities) require the State to dedicate future CDBG funds to secure the loan. Private water companies may be eligible as sub-recipients to the city, town or county and would have to work closely with the public entity on proposed projects.</td>
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Rural Water Infrastructure Committee

- Partnership of state, federal and private organizations that provide funds and technical assistance to small water & wastewater systems

- Meets quarterly – usually in Phoenix but can go on the road

- Goal is to function as a one-stop shop for rural communities of less than 10,000 population

- Major RWIC partners focus collective resources on those PWS in greatest need – imminent threat to public health & safety

- Funding matrix also available here

https://rwic.net
Financial Management and Rates for Owners/Managers/Operators of Small Water Systems

- **Workshop Details:** February 17 and 18, 2021
- **Time:** 9 am – 12 pm (both days)
- **Location - Webinar**
- Day 1 of the webinar will cover financial management for small water systems including budgeting.
- Day 2 of the webinar will cover the fundamentals of water rates including water rate increases.
- Professional development hours are available.
Sun Leisure Estates – TA Success Story

- 55+ mobile home subdivision in unincorporated Yuma County
- Community water system
- Source: Groundwater
- 143 people, retirees - fixed income
- 57 service connections
- 2 wells, 1 storage tank
**Problem:**
- Pollutant: combined uranium averaging 41 ug/L and trending upwards
- Discovery Date: 01/09/13
- Consent Order DW-27-14
- On list ~1600 days (4.5 years)
- Impact End Date: 11/02/2018

**Actions/Resolution:**
- Worked with community to become a county improvement district (no longer ACC regulated)
- ADEQ recommended PWS to receive a grant from the Small Drinking Water System Fund for $95,000 for purchase & installation of the ion-exchange treatment system
- ADEQ TA contractor prepared ATC/AOC applications and supervised installation
- HOA President oversaw day-to-day construction of support needs – preparing site, erecting treatment building with climate controls, power
- Collaboration resulted in completed project on time (6 mo) & $20,000 under budget

**Lessons Learned/Process Improvements:**
- Work directly with PWS from the beginning
- Giving them affordable options for resolving the problem
- Providing technical support & sources of possible funding
Sun Leisure Estates – TA Success Story

- AdEdge uranium treatment system
Jones Co-op – TA Success Story

Jones Co-op
Arsenic Concentrations 2016-2019

Arsenic Concentration (mg/L)

- Distribution pipe (4-6 inch PVC)
- Water Facility
- Properties on City of Yuma water service
**Problem:**
- Small water cooperative in unincorporated Yuma County
- 21 homes: 4 on city water; 3 vacant
- One well, 3,500 gallon storage tank, booster pump, hydro-pneumatic tank
- Remaining residents cannot afford city impact fees
- All homes on septic tanks
- Arsenic level ~ 13 ug/L

**Actions / Resolutions:**
- TA provider conducted system evaluation & arsenic treatment options
  - e.g., connect to city, centralized treatment, point-of-use devices
- ADEQ recommended Co-op for $9,500 grant to purchase & install point-of use devices in kitchens
- PWS hired local plumber to install units
- Once units are installed, compliance for arsenic moves from EPDS to individual homes
- 1st set of compliance samples: all <0.005 mg/L (non-detect)

**Lessons Learned/Process Improvements:**
- Work directly with PWS from the beginning
- Giving them affordable options for resolving the problem
- Providing technical support & sources of possible funding
Problem:

- Town has conventional surface water treatment plant that receives WMIDD water – coagulation, upflow clarifier, three dual filter trains
- Water system demands are seasonally reversed: summer 2,900 persons; winter 3,300 persons
- Distribution system south of I-8 is overbuilt for current demands leading to persistent TTHM exceedances during summer – fall months
Actions/Resolutions:

- ADEQ TA contractor evaluated treatment alternatives (2015) including:
  - conventional treatment with GAC;
  - enhanced coagulation with either:
    - ferric chloride & chlorine,
    - alum & chlorine dioxide,
    - microfiltration, or
    - reverse osmosis
- The Town felt these were too costly to construct or maintain annually
- The Town had some success with operational changes – line flushing, managing tank levels but still had exceedances at furthest reaches of the system
- Town also explored tank mixers, in-line aeration, autoflush stations
- Town decided to loop the distribution system to reduce water age
- ADEQ TA contractor provided design support for ATC application
Town of Wellton – TA Success Story

Lessons Learned/Process Improvements:

• Listen to the client
• When possible, utilize local talent: local engineering firm was able to provide survey, ADOT permitting & construction management for installation of line
• Town worked in parallel with design process to get necessary funding (WIFA) for construction
Questions??