Drinking Water Inspections: What to Expect After a Forest Fire

Cole Pihl
Cole Pihl has been an Inspector and Compliance Officer for the Arizona Department of Environmental Quality since July 2017. He obtained his Bachelor’s Degree in Environmental Sciences from the University of Arizona and his Master’s Degree in Environmental Policy from Arizona State University. He currently holds a certification as a Grade 1 Water Treatment Operator.
Who do we Inspect?

Public Water Systems

- 15 service connections or
- Regularly serve an average of at least 25 individuals at least 60 days out of the year.
Site visits are NOT for compliance
  - Strictly for ADEQ to assist the system
Walk through of facility
  - Identify possible damages for the system to repair before coming back online
  - Address questions (sampling plans, start up processes, paperwork, monitoring)
Steps to Take Prior to Site Visit

- Have a knowledgeable person available
- Come prepared with questions, concerns, and observations that you have about your system
- Review monitoring history; accessible at: Safe Drinking Water Information System
Elements of a Site Visit to Consider

- Source
- Treatment
- Distribution System
- Finished Water Storage
- Pumps/Pump Facilities and Controls
- Monitoring/Reporting
- Water System Management/Operations
- Operator
- Distribution
- Observations of damaged and/or melted well heads?
- Did your well(s) fail at all during the forest fire? Why?
- Considerations for a back up well and/or emergency consecutive connection
- Alternative Sources
  - Bottled Water
  - Hauled Water
  - Different water system
Did your disinfection work properly when excess demand was required?
Did you have enough of a supply on hand?
Was it available and easy to access?

Note: Remember to always follow Engineering Bulletin 8 for disinfection procedures.
Treatment and Storage

- Any changes or additions made to your treatment process in lieu of the fire?
- Enough storage capacity for your customers? Did the tank run out of water?
- Was your stored water used to combat a fire?
- Additional storage needed?
- Ensure proper backflow testing annually.
- Were any of your devices compromised?
- Consider potential new sources of cross connection.
Was your operator notified and properly trained on contingencies regarding the fire?

Were they available to take samples or fix any problems?

What does their contract state in relation to emergencies?
1. General Public Water System (PWS) Information:

<table>
<thead>
<tr>
<th>PWS ID Number</th>
<th>PWS Type</th>
<th>PWS Source Types</th>
<th>Population Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEQ:</td>
<td>CVWS</td>
<td>Groundwater</td>
<td></td>
</tr>
</tbody>
</table>

2. Inspection

- Inspection Date: ___________
- Arrival Time: ___________
- Departure Time: ___________
- Person Conducting Inspection: ___________
- Owner/Responsible Party: ___________
- Present at Inspection: [ ] Yes [ ] No

<table>
<thead>
<tr>
<th>Well Head</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well site has a security fence and gates are properly locked and secured?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] N/A</td>
<td></td>
</tr>
<tr>
<td>Pumps/ Mechanical equipment</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Tank(s)</td>
<td>Air vent, overflow pipe, hatch with gasket/ seal and locking device, gauge or</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td></td>
</tr>
<tr>
<td>Pressure Tank(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Addition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment Calibration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Collection: scheduled, locations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Summary of observations, recommendations and corrective actions required:

I certify that I am the person authorized to fill out this form and the information contained herein is true, accurate and complete to the best of my knowledge and belief.

Operator Signature: ___________
Date: ___________

Date form provided to owner or responsible party: ___________
Distribution System

- Observe overall quality of your finished water for noticeable differences
  - Discoloration, smell, taste
- Do a thorough check of the piping and components within your distribution system
  - Leaks
  - PVC pipe damage
  - Damage to Electrical components (generators, pumps, switches, wiring)
    - Did you have any difficulties restoring power?
Other Considerations - Floods/Mudslides

- Be aware of the potential for flooding after forest fires
  - Ensure your components are not overtaken by flood waters
    - Proper air vents and seals on wells
    - Overflows and drains clear on storage tanks
    - Proper grading of storage tank foundations
Other Considerations - Floods/Mudslides
Other Considerations - Floods/Mudslides
Other Considerations - Dead/Damaged Trees

- Be aware of all trees in and around your water system area
  - Ensure they do not run the risk of falling and damaging your components
  - Routine DW inspections require trees to be cut that are touching/adjacent to components.
Approval to Construct/ Approval of Construction

- Required for constructing new components within the system (Well, Storage Tank, Treatment)
- Permitting process through our engineer review unit
- Note: ATC/AOC not required if replacing with identical structures.
  - i.e. Same tank material, size, schematics.
INSTRUCTIONS

Please complete and sign an Approval to Construct (ATC) Application for Drinking Water Facilities to obtain authorization to construct a new public drinking water system, modify an existing facility, or make an alteration that will affect the treatment, capacity, water quality, flow, distribution, or operational performance in accordance with Arizona Administrative Code (AAC) R18-5-505.

The application is interactive and allows you to hover over the blue boxes for detailed information about that section. Click on the blue URL link for external source of information.

GENERAL APPLICATION PROCESS

1. Submit an ATC application and the appropriate supplemental information and forms identified in the checklist below. Please see the Delegated Agencies for Public Water System document to determine where to submit your application (county, City, or ADEQ Regional Office).

   http://static.azdeq.gov/er/dw_delegation_agencies.pdf

APPLICATION CHECKLIST

<table>
<thead>
<tr>
<th>Document Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval to Construct (ATC) Application</td>
</tr>
<tr>
<td>Fee</td>
</tr>
<tr>
<td>Site Plan</td>
</tr>
<tr>
<td>Construction Quality Drawings and Plans</td>
</tr>
</tbody>
</table>
Sampling and Monitoring Considerations

- Following a natural disaster, ADEQ’s Seasonal Start-Up Form can be utilized but is not required. Contains items such as:
  - Flushing all pipes.
  - Cleaning all water storage tanks (if applicable).
  - Disinfecting entire water system.
  - Inspecting the entire water system using the ADEQ required checklist.
  - Repairing water system (if applicable).
  - Collecting special purpose samples to test for bacteria and disinfectant residual and submitted with this form to your regulatory agency.

- When in doubt, contact your Compliance Assistance Coordinator (CAC)
Beginning April 1, 2016, seasonal non-community public water systems are required to meet the reporting requirements specified in 40 CFR § 141.861 (a)(5): **A seasonal system must certify, prior to serving water to the public, that it has complied with the State-approved start-up procedure.** Seasonal start-up procedures must be completed each year or season that the system is re-opening.

A system:
- May certify that it remained pressurized;
  Or
- Must perform a start-up procedure if it did not remain pressurized

<table>
<thead>
<tr>
<th>Certification that System Remained Pressurized or Has Completed the Start-up Procedure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWS ID Number</td>
</tr>
<tr>
<td>The PWS will open for the season on the following date:</td>
</tr>
</tbody>
</table>

**System Remained Pressurized (Waiver):** The system maintained and operated at a pressure of at least 20 psi through the off-season. Indicating "Yes", certifies that the PWS qualifies for a waiver from the start-up procedures based on keeping system pressure.

**Seasonal Start-up Procedures (Certification):** The system was depressurized, or, did not maintain a pressure of at least 20 psi through the off-season. Indicating "Yes", certifies that the PWS used and completed the checklist on page 2 (placed on file with the system records and available upon request), and completed all of the start-up procedures on page 3.

**CERTIFICATION BY AUTHORIZED SIGNATORY:** "I certify under penalty of law I am the person authorized to fill out this form, the water system has been inspected and reviewed as indicated..."
Pre-inspection Checklist

Your public water system is due for a sanitary survey. This is a routine inspection conducted every 3 years. Please complete the checklist and return it to the ADEQ inspector prior to the inspection.

PWS Name: ____________________________ PWS ID Number: AZ04- __________ Date: __________

Name and title of person completing form: ____________________________

General Paperwork Review

Do you have the following documents on-site and available at the time of inspection?

☐ Yes ☐ No 1. Revised Total Coliform Rule Microbiological Sample Siting Plan (MSSP) A.A.C. R18-4-126
☐ Yes ☐ No 2. Lead & Copper Monitoring Plan A.A.C. R18-4-111
☐ Yes ☐ No 3. Stage 2 Disinfection Byproducts (DBP) monitoring plan (for facility which adds a primary or residual disinfectant other than UV light) A.A.C. R18-4-124
☐ Yes ☐ No 4. Emergency Operations Plan A.A.C. R18-4-204(a)
☐ Yes ☐ No 5. Maintenance Records
☐ Yes ☐ No 6. Annual Backflow Prevention Assembly testing records A.A.C. R18-4-215
☐ Yes ☐ No 7. Records of ADEQ approval (if necessary) for system components added in last 5 years
☐ Yes ☐ No 8. Records of water quality analyses
☐ Yes ☐ No 9. Records of turbidity and of continuous residual disinfectant concentration measurements (Surface water and GUDI* systems only)

*GUDI = Ground water under the direct influents of surface water

Physical Facilities A.A.C. R18-4-203

Perform a walk-through of your systems and verify that the following components are installed and in good condition.

☐ Yes ☐ No 1. Well slabs are intact and in good condition. Small cracks have been sealed.
☐ Yes ☐ No 2. Raw water sample taps are installed at all wells.
☐ Yes ☐ No 3. All wells have a tuned down vent that terminates 2 ft above the slab with a #16 non-corrodible mesh screen.
☐ Yes ☐ No 4. All openings into well casing(s) are sealed, including electrical conduits and holes.
☐ Yes ☐ No 5. Sample taps are installed at all Entry Points to the Distribution System (EPDS).
☐ Yes ☐ No 6. All chemicals used in the system conform to AWWA/WEF Standard 60.
☐ Yes ☐ No 7. All storage tank overflow pipes extend down to 12-24 inches above the ground surface and are protected with a securely fitting flapper gate or a #16 non-corrodible mesh screen.
☐ Yes ☐ No 8. Hatches on storage tanks are secured and gaskets are in good condition and fit tightly.
☐ Yes ☐ No 9. Vegetation is maintained and controlled around system facilities.
☐ Yes ☐ No 10. Area around storage tank(s) is graded to provide drainage away from tank/no sediment has accumulated around tank or foundation (see picture on next page).
☐ Yes ☐ No 11. All pressure tanks have a pressure gauge and a pressure relief valve.

Pre-inspection Checklist for Community Water Systems

If you have answered “No” to any of the above questions, list the corrective action(s) taken to address the situation(s). Use additional paper if needed.

If all deficiencies identified have not been addressed, provide a brief explanation why.

NOTE: ADEQ inspectors are not allowed to drink samples/pick up selected storage tanks. Please have recent photos of the tank(s) opened to show pointing of clogging/algae/algae growth and a photo of the event showing the height above the tank bed/lowing waterline area. If you do not hand inspection data, check the report to please. Only when there is using properly.

Missing any forms, plans, or templates? Click on the links below

- Lead and Copper Monitoring Plan
- Microbiological Sample Siting Plan for PWS serving 1000 or fewer people
- Microbiological Sample Siting Plan for PWS serving 1001 or more people
- Emergency Operations Plan Template
- ADEQ Operation & Maintenance Manual Official Version

Don't get caught with a common violation:

1. RTCR Microbiological Sample Siting Plan violations
2. Area around storage tank not properly graded to allow water to flow away from the base of tank
3. Failure to develop an emergency operations plan
4. Failure to annually test backflow prevention assemblies & retain records
5. Operations & Maintenance

Well's sanitary seal in bad condition
Missing raw water sample tap
Cracked well slab
Broken air vent
Excessive vegetation around storage tank
Buried Foundation
Hatch lacks a seal and lock
Busted screen
Why Do I Need a Sanitary Survey?

Public water systems (PWSs) undergo sanitary surveys to assess their capability to supply safe drinking water to consumers. ADEQ conducts onsite sanitary surveys at all public water systems located within the state, except where authority has been delegated to Pima County Department of Environmental Quality and Maricopa County Environmental Services Department.

Sanitary surveys provide an opportunity for ADEQ to perform a comprehensive and accurate review of the system’s components and to educate the owners/operators about proper operations and maintenance. The survey evaluates eight elements:

1. Source
2. Treatment
3. Distribution System
4. Finished Water Storage
5. Pumps/Pump Facilities and Controls
6. Monitoring/Reporting/Data Verification
7. Water System Management/Operations
8. Operator Compliance with State Requirements

How Often Do I Need a Sanitary Survey?

Sanitary surveys are conducted at least every three to five years, depending on the system classification:

- Community Water System (C) – Every three years
- Non-Community Water System (NC) – Every five years
- Transient Non-Community (NTNC) – Every five years

Want to know what to expect for your sanitary survey? [Learn More >]

Final Thoughts

- ADEQ is here to assist you on returning your system to normal operations
  - Engineers
  - Enforcement Officers
  - Compliance Assistance Coordinators
  - Inspectors
  - Rule Specialists
  - Technical Assistance
Questions

- Contact Jason Bobko for more information on the Inspections and Compliance Unit
  - 602-771-4253
  - Bobko.Jason@azdeq.gov

- Cole Pihl
  - Inspector/Compliance Officer
  - 602-771-4663
  - Pihl.Cole@azdeq.gov