



# **Arkansas Public Water System Compliance Summary**

**Arkansas Department of Health**

Center for Local Public Health

Environmental Health Branch

**Engineering Section**

Revised March 2018

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## Executive Summary Community Public Water System Compliance Responsibilities

This document is intended to be a summary of the responsibilities of community public water systems in complying with: the "Arkansas Rules & Regulations Pertaining to Public Water Systems" (See Appendix A); the "National Primary Drinking Water Regulations"; the "National Primary and Secondary Drinking Water Standards" (See Appendix B); the "Water Operator Licensing Law"; and the "Rules and Regulations Pertaining to Water Operator Licensing" as administered by the Arkansas Department of Health ; Engineering Section's Public Water System Supervision Program. It does not include all details necessary to insure compliance, but advises the operator of the **primary** areas of responsibility and refers the operator to the appropriate location for the regulatory citation, as well as the location of any additional information.

The Arkansas State Board of Health's "Rules and Regulations Pertaining to Public Water Systems" (RRPPWS) are promulgated under the authority of Act 96 of 1913 and Act 8 of the Second Extraordinary Session of 1961, as amended. The Arkansas State Board of Health's "Rules and Regulations Pertaining to Water Operator Licensing" (RRPWOL) are promulgated under the authority of Act 333 of 1957, as amended.

The "Arkansas Rules and Regulations Pertaining to Public Water Systems" and Federal Public Law 93-523 (The Safe Drinking Water Act) require that water from all public water systems meet the National Primary Drinking Water Regulations, as promulgated by the U. S. Environmental Protection Agency. The National Primary Drinking Water Regulations can be found at EPA's Web site <http://water.epa.gov/drink/index.cfm>, or by a link from the Engineering Section's web site at [www.healthy.arkansas.gov/eng/](http://www.healthy.arkansas.gov/eng/). See Appendix B, for a list of regulated contaminants.

### List of acronyms:

ADH	Arkansas Department of Health
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
BMR	Bacteriological Monitoring Record
BWN	Boil Water Notice
CCCP	Cross Connection Control Program
CCR	Consumer Confidence Report
CFR	Code of Federal Regulations
CT	Residual Disinfectant Concentration x Disinfectant Contact Time
CWS	Community Water System
DDBPR	Disinfection & Disinfection By-Products Rules
DC	Double Check Valve
ECC	Emergency Communication Center
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GWUDI	Ground Water Under Direct Influence of Surface Water
MCL	Maximum Contaminant Level
NPDWR	National Primary Drinking Water Regulations
NPDWS	National Primary Drinking Water Standards
NSDWS	National Secondary Drinking Water Standards
NTU	Nephelometric Turbidity Unit
OIT	Operator-In-Training
OSHA	Occupational Safety and Health Administration
PWS	Public Water System
RP	Reduced Pressure
RRPPWS	Rules and Regulations Pertaining to Public Water Systems

RRPWOL	Rules and Regulations Pertaining to Water Operator Licensing
SDWA	Safe Drinking Water Act
SWTR	Surface Water Treatment Rules
UAW	System Unaccounted for Water

The most current version of the Compliance Summary and other Engineering Documents may be found on the Engineering Homepage: <http://www.healthy.arkansas.gov/eng>.

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# 1 HOW TO CONTACT US

## 1.1 PHYSICAL LOCATION INFORMATION

The Arkansas Department of Health (herein referred to as the Department); Engineering Section (herein referred to as the Engineering Section or Section) is located in Little Rock, Arkansas.

The US Mail and physical address is:

Engineering Section, Slot 37  
Arkansas Department of Health  
4815 West Markham Street  
Little Rock, AR 72205

## 1.2 TELEPHONE CONTACT INFORMATION

The primary telephone number for all of the Engineering Section staff is: (501) 661-2623. For after business hours emergencies, contact the Department's Emergency Communications Center (ECC) at 800-554-5738. The on-call Engineering Section staff member will be contacted by the ECC.

## 1.3 INTERNET CONTACT INFORMATION

The Department's World Wide Web internet site is located at:

<http://www.healthy.arkansas.gov>

The Engineering Section's internet website is located at:

<http://www.healthy.arkansas.gov/eng>

The Engineering Section's internet websites can also be accessed from the Department's site within "Licensing, Permits & Plan Reviews" and "Public Health Safety" under subcategories titled Drinking Water in the list.

The Engineering Section's internet website has:

- Rules and Regulations for your review or download
- Public Water System Compliance Summary (this document latest version) to review or download
- Water Operator Licensing Information and Forms
- Routinely used forms and other items are readily accessible
- Mailing address & phone number of community public water systems
- Hot links to other related websites

Engineering Section has two general e-mail addresses to be used for general contact or when the specific staff member is unknown.

Engineering Section: [safewater@arkansas.gov](mailto:safewater@arkansas.gov)

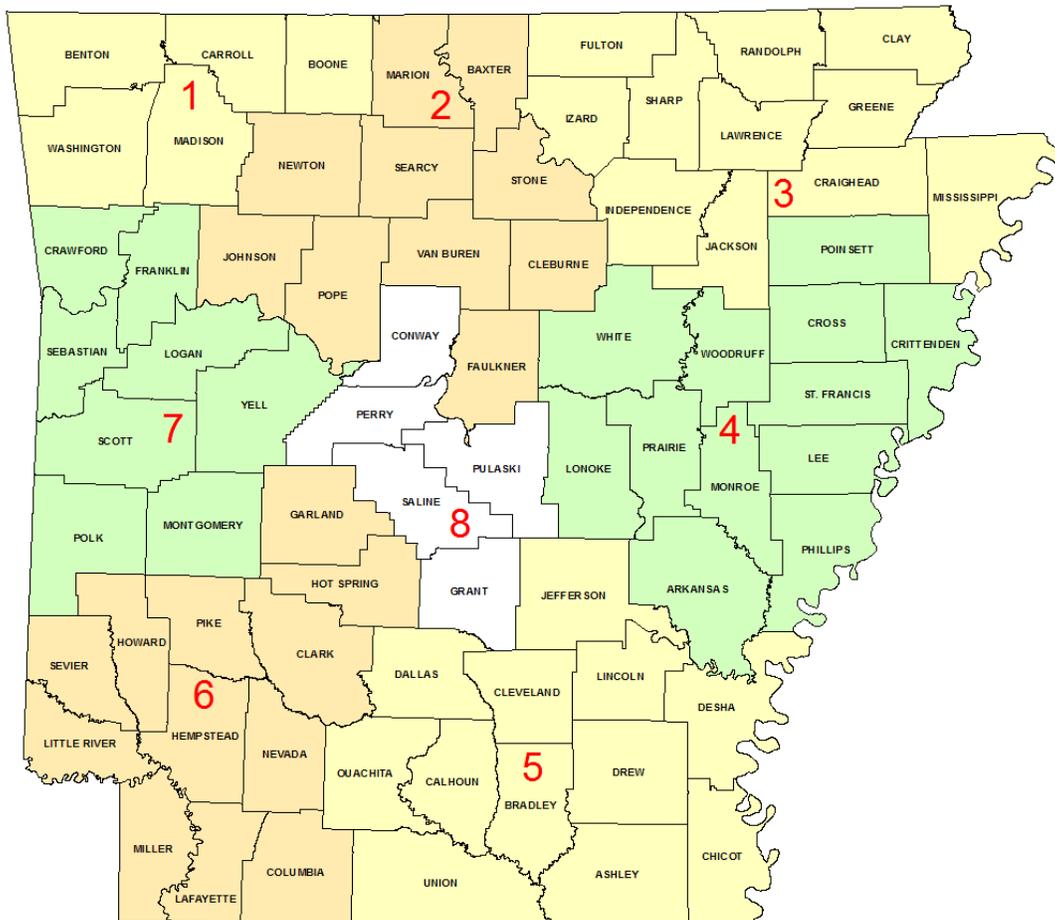
Water Operator Licensing Program: [ADH.water.licensing@arkansas.gov](mailto:ADH.water.licensing@arkansas.gov)

## 1.4 DISTRICT STAFF ASSIGNMENT INFORMATION

To better provide technical support and the required regulation of all public water systems, the Engineering Section has divided the state into districts. Each district includes an engineer supervisor, one engineer and one environmental specialist. (See Map 1.1 below) A current list of district staff is available on the internet at:

<https://www.healthy.arkansas.gov/programs-services/topics/drinking-water-plan-review>

Map 1.1 Engineering Districts



### 1.5 PROGRAM SPECIFIC STAFF

The Engineering Section, in addition to the district staff, has staff assigned to specific program areas to provide additional statewide assistance. The specific program areas are:

- Comprehensive Performance Evaluations
- Consumer Confidence Reports
- Cross-Connection Control
- Disinfection - Disinfection Byproducts Rule
- Groundwater Rule
- Information Technology (GIS, Data Management)
- Lead and Copper Rule
- Regulation Compliance and Enforcement
- Service Fee Collection
- Source Water Protection
- Surface Water Treatment Rule
- Transient Non-Community Public Water Systems
- Water Operator Certification
- Water Quality Monitoring

A current list of program specific staff is available on the internet at:

<https://www.healthy.arkansas.gov/programs-services/topics/drinking-water-plan-review>

## **2 SAFE DRINKING WATER ACT MONITORING REQUIREMENTS**

### **2.1 AUTHORITY**

The Safe Drinking Water Act requires all public water systems to collect and analyze samples for the presence of certain microbiological and chemical contaminants. The type, number, and frequency of monitoring is determined by the type of water system (community, non-transient non-community, or transient non-community), the type of source (well, surface water, or ground water under the direct influence of surface water), and the population served.

### **2.2 PROVISION OF SERVICES BY THE ARKANSAS DEPARTMENT OF HEALTH**

- 2.2.1 In Arkansas, the Department of Health provides a service to the water utilities, using, in part, the fees collected from water systems under the Public Water System Service Fee Act, which includes collection and analysis of samples for most required inorganic chemical contaminants, all organic chemical contaminants, and all radiochemical contaminants. The samples are collected by Engineering Section staff, analyzed by laboratories in the Public Health Laboratory Branch, and reported back to the water system by the Engineering Section. Any violations of the National Primary or Secondary Drinking Water Standards are noted in the report, as well as any actions that are required by the federal regulations.
- 2.2.2 The Department provides analytical services, but not sample collection services, for routine bacteriological and lead/copper monitoring as required by the Total Coliform Rule and the Lead & Copper Rule.
- 2.2.3 For the Revised Total Coliform Rule, the Department provides the necessary sample containers to the water utility operator, who collects the samples and forwards them by the timeliest method to the Department's microbiological laboratories in Little Rock.
- 2.2.4 For Lead / Copper samples, containers are provided to the water utility operator, with instructions on the appropriate date for sample collection. Water systems transfer custody of the samples to Department staff at local health units, the samples are then collected by the Department's courier and transported to the Department's Inorganic Chemistry Laboratories, in Little Rock.
- 2.2.5 Other analyses, such as Turbidity, Disinfectant Residual, Temperature, Chlorine and pH, as required by specific regulations, must be performed by the water utility staff, and reported to the Department on the required monthly operational reports.

### **2.3 RESPONSIBILITY FOR CONDUCTING ANALYSES**

- 2.3.1 The Department provides analytical services in the belief that providing these services is the most efficient use of public funds (customer funds). The Department, however, can assume no responsibility for assuring that compliance samples are collected and analyzed in conformance with the requirements of the National Primary Drinking Water Regulations. These regulations place full responsibility for collecting and analyzing all compliance samples on the water utility.
- 2.3.2 The Department makes every effort to ensure that all samples (for which the Department provides collection and analysis services) are collected and analyzed within the mandated time frames. However, the possibility does exist that the Department could err, or that circumstance outside the Department's control could result in the analyses not being conducted as required by the regulations.
- 2.3.3 It is critical that each water utility manager be familiar with all required monitoring schedules, and that the manager verifies that such samples are collected in the manner and timeframe prescribed by the regulations.

## 2.4 RECORDKEEPING

It is the responsibility of each water system to maintain adequate records proving compliance with all requirements, both state and federal. Table 2.1 designates record types and their retention times as required by the Safe Drinking Water Act.

Table 2.1 Record Type and Retention Time

<b>Record Type</b>	<b>Ret. Time</b>
Bacteriological Monitoring Records	5 years <sup>a</sup>
Treatment Operation Reports	10 years
Chemical Analysis Records	10 years <sup>a</sup>
Written reports such as sanitary surveys and Engineering Reports	10 years <sup>b</sup>
Variations or exemptions	5 years <sup>c</sup>
Action taken to correct violation	3 years <sup>d</sup>
Public Notices	3 years
Consumer Confidence Reports	3 years
Lead and Copper Rule analysis, reports, surveys, letters, etc.	12 years
Optimal Corrosion Control Records	Indefinitely

- <sup>a</sup> Including supporting operational records.
- <sup>b</sup> Following completion of surveys and reports.
- <sup>c</sup> Following expiration of variance or exemption.
- <sup>d</sup> After last action with respect to violation.

Unless a longer record retention period is specified elsewhere or required by the National Primary Drinking Water Regulations, the Arkansas *Rules and Regulations pertaining to Public Water Systems* requires that all records including analyses results, reports, forms, charts, daily logs, and electronic files shall be retained for a minimum of three (3) years and shall be made available for review if requested.

### 3 BACTERIOLOGICAL MONITORING

This section describes bacteriological sampling and analytical result interpretation for Public Water Systems. If you have any questions about this document, contact the Engineering Section.

#### 3.1 AUTHORITY

- 3.1.1 Under the National Primary Drinking Water Regulations (Section 141.853), each public water system must take routine samples from the distribution system for microbiological analysis for coliform organisms. The detection of coliforms in the drinking water is the underlying basis for the **Revised Total Coliform Rule**. Failure to perform required monitoring will result in mandatory public notification. (See Section 18)
- 3.1.2 These samples must be analyzed in a laboratory certified by the state primacy agency (Arkansas Department of Health - ADH) for total coliforms. In Arkansas, the Department of Health provides disposable sample containers to each water system, which then collects the required number of samples and submits them to the ADH lab for analysis. The number of required samples to be submitted is determined by the system's population served. See Tables 3-1 and 3-2 for number of samples. (Some large systems have their own certified laboratories for bacteriological testing. These systems must provide part of their routine compliance samples with the ADH laboratory as a quality assurance measure.) (See also, Engineering Section VII of the Rules and Regulations Pertaining to Public Water Systems).

#### 3.2 COMPLIANCE SAMPLING

- 3.2.1 Routine compliance samples (**regular distribution samples**) and repeat samples (**resamples**) this also includes to all replacement compliance samples must be collected according to the system's sampling site plan using designated site codes. This site plan must be submitted to and approved by the Department. **Routine compliance samples and repeat samples without an appropriate site code will be rejected by the laboratory.** If you are unsure about your water system's sampling site plan, contact the Engineering Section.
- 3.2.2 Each public water system must submit the required number of samples to the ADH laboratory, within a specified time period. For all public water systems, the minimum frequency for sampling is monthly. Each Monday, the ADH mails sample containers to 25% of the water systems. During the week following the receipt of sample containers, the water system should take their samples and submit them for analyses. The ADH laboratory must receive the samples so that they can be analyzed within 30 hours of sample collection. **Samples that have not been analyzed within 30 hours following sample collection will be rejected by the laboratory.**
- 3.2.3 It is the system's responsibility to deliver to the ADH valid compliance samples for all required monitoring. The samples can be hand delivered to the ADH laboratory or the ADH Local Health Unit courier service shipped via the U.S. Postal Service, or other overnight commercial carrier to meet the 30 hour time limit.
- 3.2.4 Failure to receive sample bottles from the Department does not relieve the water system from required compliance sampling. You should contact your ADH District staff if you experience sampling problems. Table 3.1 describes the number of samples per population requirements.

Table 3.1 Community and Non-Transient Non-Community Public Water Systems

Population	Minimum Number of Monthly Samples
3300 or less	3
3301 to 4100	4
4101 to 4900	5
4901 to 5800	6
5801 to 6700	7
6701 to 7600	8
7601 to 8500	9
8501 to 12900	10

12901 to 17200	15
<b>Population</b>	<b>Minimum Number of Monthly Samples</b>
17201 to 21500	20
21501 to 25000	25
25001 and up	Contact the Engineering Section for the Number of Samples required.

**NOTE:** Ground water systems with a population greater than 4900 and all surface water or surface water influenced systems must split their sample collection into two or more sample periods per month.

- 3.2.5 All repeat samples are to be collected on the same day except for systems which have a single service connection may collect resamples over multiple days.
- 3.2.6 If any repeat sample is total coliform positive, an additional set of repeat samples must be collected. This process must be repeated until one complete set of repeat samples is negative for total coliform or it is determined that an Assessment has been triggered.

Table 3.2 Transient Non-Community Public Water Systems

<b>Population Served</b>	<b>Minimum Number of Monthly Samples</b>
25 to 1000	1
1001 to 2500	2
2501 to 3300	3
3301 and up	Use table for Community and Non-Community Non-Transient Public Water Systems

- 3.2.7 If the water system has a seasonal operation, samples are only required for the calendar months during which operation occurs. For any partial month or quarter of operation, sampling is required.


- 3.2.8 Seasonal water systems must submit certification that they conducted start up procedures of pressurizing, flushing and disinfecting the water system and obtained Coliform absent results on two consecutive sets of samples prior to serving water to consumers each season.

**3.3 BOIL WATER ORDER SAMPLING**

See Policy for Boil Water Notices in Chapter 6 of this manual

**3.4 NEW CONSTRUCTION SAMPLING**

No mains or facilities shall be put into service until safe sample results are received for all samples.

**3.4.1 Water Mains**

Collect one sample per sampling point per day on two separate days. We recommend a minimum of one sampling point for each different stretch of pipe sterilized, for each dead end line, or at least one sample per mile of pipe. Refer to ANSI/AWWA C651 for disinfection procedure requirements.

**3.4.2 Water Treatment Facilities**

Collect one sample per sampling point per day on two separate days. Select sampling points in accordance with the latest version of ANSI/AWWA C653 or contact the Engineering Section.

#### 3.4.3 Water Storage Facilities

Collect one sample per sampling point per day on two separate days. Select sampling points in accordance with the latest version of AWWA C652 or contact the Engineering Section.

### 3.5 SAMPLING PRECAUTIONS

#### 3.5.1 Bottles

Use only bottles that have been furnished by the Department. Only use sample bottles that have a sterilization seal that has not been broken. To ensure accurate testing, each sample bottle has a sample preservation agent (sodium thiosulfate) present as a small amount of liquid, powder, or solid. **DO NOT RINSE** the bottle before collecting the sample.

#### 3.5.2 Sampling Locations

3.5.2.1 When collecting regular monthly samples always follow the bacteriological sampling site plan for your system. If your system does not or has not developed a sampling site plan, contact the Engineering Section.

3.5.2.2 Do not collect samples from fire hydrants, blowoffs or yard hydrants with weep holes, frost proof faucets, leaking faucets, or swivel type faucets.

3.5.2.3 The samples should be collected from faucets that are used frequently, or from stations especially constructed for bacteriological monitoring. Use indoor sample sites if possible, to avoid sample contamination from rain or wind blown dust.

#### 3.5.3 Delivery to laboratory

The sample must be RECEIVED by the Department's laboratory within 30 hours of the time of sample collection. Do not collect samples that can not be delivered to the Department within 30 hours of the time of collection. The day of receipt by the Department's laboratory must be a normal business day, not a weekend or holiday. The Department recommends that sample collection be scheduled so that samples will be delivered to the shipping agent (US Postal Service, UPS, ADH Local Health Unit) just prior to the time the shipping agent will ship the sample bottles to Little Rock.

#### 3.5.4 Sample amount

In order to be analyzed, the sample must contain a minimum of 100 ml. of water. The bottle must be filled at least to the indicator mark; however, an air space should be left. Do not overflow the bottle.

### 3.6 COLLECTING THE SAMPLE

#### 3.6.1 Flushing

Let the water rapidly flow long enough to flush out service connection lines and secure fresh water which is representative of the supply main. We recommend two minutes or longer.

#### 3.6.2 Chlorine Residual

Check the chlorine residual. Record the chlorine residual on the Bacteriological Monitoring Report. If a measurable chlorine residual is not present, notify the distribution system and treatment plant operators to evaluate operational changes to increase the chlorine residual.

#### 3.6.3 Decontaminating the faucet

Destroy contaminating matter on the faucet or sampling point by carefully flaming the orifice or mouth sufficiently to evaporate water. A butane or propane torch is ideal; however, a good flaming device

can be made from a wad of cotton on a piece of wire and saturated with rubbing alcohol. The alcohol flame will not damage plated fixtures or leave soot.

#### 3.6.4 **Second Flushing**

After flaming, let the water rapidly flow long enough to flush out the heated water. We recommend one minute. Then slow the flow to a steady non-splashing stream but not so slow that you get individual drops.

#### 3.6.5 **Filling the bottle**

3.6.5.1 Remove the bottle from the container, and then remove the bottle cap. Do not touch the mouth or the threads of the bottle or the under side of the cap. Do not lay the cap down.

3.6.5.2 Hold the bottle at a slight angle, under the faucet, and fill to the indicator mark of the bottle. Avoid letting the water splash against the rim of the bottle, your hands, or nearby objects. Contamination may be introduced in this way. Do not let the bottle touch the faucet or any other object.

3.6.5.3 Replace the cap. After the cap is replaced wipe any moisture off the outside of the bottle and cap.

#### 3.6.6 **Sample Identification**

Fill out the Water Analysis – Bacteriological information sample collection form enclosed in the container. Fill the form out with pencil or waterproof ink. Forms filled out with ink pens often blur badly if they become wet.

##### 3.6.6.1 Filling Out the Sample Form

3.6.6.1.1 Fill in the Month, Day, and Year the sample is collected on.

3.6.6.1.2 Fill out B number from sample site plan. (?“maybe include example form or sample site plan”)

3.6.6.1.3 Keep the carbon for your records.

3.6.6.1.4 Fill in the exact time of sample collection in the box labeled hour. Be sure to indicate A.M. for morning and P.M. for evenings.

3.6.6.1.5 Write the Bacteriological Sample Site code in the box titled "Definite Location of Sample or Street & Number". If the site does not have a code, write in the location of the sample site. A street address is preferred. If the site does not have a sample site code, mark "Special" in the type of sample box or the sample will be discarded by the laboratory staff and your sample analysis report will indicate "NSI" no site identification.

3.6.6.1.6 Write in the name of the City and County that the sample is collected in.

3.6.6.1.7 Write in the name of the person who collected the sample in the box titled "Collected by".

3.6.6.1.8 If you are a Community water system check the box marked "Public". If you are a Non-Community water system check the box marked "Public" and the box marked "Non-Community".

3.6.6.1.9 In the box titled "Source" check the small box that best describes the source of the water sample.

3.6.6.1.10 If you wrote a sample site code in the box titled "Definite Location of Sample or Street & Number", leave the return mailing address blank. If you did not use a

sample site code write in the return mailing address of the person you want the report to go to in the box titled "Send Report To".

- 3.6.6.1.11 Write the name of the water system from which the sample is collected in the box titled "Water System Name".
- 3.6.6.1.12 Write in the Public Water System identification number for the water system that the sample was collected from in the box titled "Water System ID Number".
- 3.6.6.1.13 Next check the small box that best describes the type of system being sampled. In the Source box check the small box that best describes the system's source type. Next check the small box that best describes the sample's purpose. If it is for a routine distribution compliance sample, the "Regular Distribution Sample" box should be checked. If a sample site code is not used, the "Special" box should be checked. You may check more than one small box if more than one will apply. If the sample is untreated, be sure to check the "Raw Water" box. If the sample is a "Boil Order" sample, be sure to check the "Boil Order" box. If the sample is for New Construction, be sure to check the "New Construction" box. If the sample is an investigative sample, be sure to check the "Investigation" box.
- 3.6.6.1.14 Record the chlorine residual on the line provided.
- 3.6.6.1.15 If you are resampling a regular site using a site code, mark the resample box. If you are resampling a new construction site, do not mark the resample box. Instead mark the "special" box and the "new construction" box. ("maybe include a table to clarify")
- 3.6.6.1.16 Proofread the form to make sure that you have entered all the information correctly.

### 3.6.7 Packaging the sample

Curl the sample card around the sample bottle so that the writing is turned AWAY from the bottle; replace the bottle and the card in the container, and mail or deliver immediately. If the container holds more than one sample, use a rubber band to attach the form to the correct sample bottle.

## 3.7 INTERPRETING BACTERIOLOGICAL ANALYSIS RESULTS

The Department tests drinking water samples in accordance with the Revised Total Coliform Rule. The underlying basis for the Revised Total Coliform Rule is for the detection of "coliform" and *E.Coli* bacteria in the water. The Department's laboratory tests the bacteriological samples to determine if any of a group of bacteria called "COLIFORM" are present. The analytical method used is called the "MMO-MUG" coliform test, more commonly referred to by the brand name Colilert®. The presence of any coliform bacteria is detected by a change in color of the sample, following 24 hours of incubation. By examining the sample under ultraviolet light, a second result is available that will indicate if any "E. coli" are present. E. coli organisms, also referred to as fecal coliforms, are a type of coliform bacteria generally associated with human or animal waste.

### 3.7.1 Assessments and Maximum Contaminate Level

Below is a list of triggers for follow-up actions.

- 3.7.1.1 System Assessments are triggered when multiple total coliform positive samples are detected during the monthly monitoring. Level 1 Assessments are triggered based on the following conditions:
  - 3.7.1.1.1 For a water system collecting fewer than 40 samples per month, no more than one sample per month can be total coliform positive.
  - 3.7.1.1.2 For a water system collecting 40 or more samples per month, no more than 5.0 % can be total coliform positive.

- 3.7.1.2 Level 2 Assessments are triggered when the system triggers a second Level 1 Assessment within a 12 month period.
- 3.7.1.3 The water system must conduct the Level 1 Assessment and report the results to the ADH within 30 days of being notified of the need for and Assessment. The Engineering Section will conduct the Level 2 Assessments with the water system. The Assessment reports shall indicate the reason for the presence of total coliform bacteria, if determined, and identify any sanitary defects that may exist in the system.
- 3.7.1.4 The report shall also document that the sanitary defects have been corrected or include a time table for their correction.
- 3.7.1.5 All identified sanitary defects must be corrected in accordance to the time table approved by the Engineering Section.

**3.7.2 Maximum Contaminate Level**

- 3.7.2.1 Any *E.coli* positive repeat sample, or any total coliform positive repeat sample following an *E.coli* positive routine sample is an *E.coli* MCL violation and is considered an acute risk to public health. Failure to conduct all required repeat monitoring following an *E.coli* positive routine sample will be considered an *E.coli* MCL violation. MCL violations also require that a Level 2 Assessment be conducted on the water system.
- 3.7.2.2 Public notification is required within 24 hours of a PWS receiving notice of an acute violation. (See Section 18 for detailed instructions).

**3.7.3 Sample Result Codes**

- 3.7.3.1 Table 3.3 lists some of the more common sample result codes, meanings, resampling requirements, and the locations that resamples are to be collected. Should you receive a bacteriological sample result not listed on these pages, please contact the Engineering Section at (501) 661-2623 for interpretation.

Table 3.3 Sample Results Codes

RESULT CODE	RESULT MEANING	REPEAT SAMPLES REQUIRED (Yes/No) #	LOCATION of REPEAT SAMPLES (Use Repeat Sample Sites indicated in Sampling Site Plan)
A	Coliform Absent	No	No repeat samples needed, sample considered Safe.
P	Total Coliforms Present	Yes, 3 per site*	Upstream (within 5 service connections of original site), downstream (within 5 service connections of original site), and the original site.*
<1	< 1 coliform / 100 ML	No	Raw water sample, No repeat samples needed.
<1F	< 1 Fecal coliform / 100 ML	No	Raw water sample, No repeat samples needed.
EA	E. coli Absent	No*	No repeat sample needed, but repeat sample could be needed if sample result is also Total Coliform Present.*
EP	E. coli Present	Yes, 3 per site*	Upstream (within 5 service connections of original site), downstream (within 5 service connections of the original site), and the original site utilizing the sample site plan.*
LA	Lab Accident	Yes, 1 per site**	Site(s) where original sample(s) was collected. Sample results Invalid.***
LTL	Leaked in Transit	Yes, 1 per site	Site(s) where original sample(s) was collected. Sample results Invalid.
NSI	No Site Indicated	Yes, 1 per site	Site(s) where original sample(s) was collected. Include proper site code information on sample collection report form. Sample

			result Invalid.
QNS	Quantity Insufficient	Yes, 1 per site	Site(s) where original sample(s) was collected. Sample results Invalid.
TIP	Test In Progress	No	Test have not been completed or finalized
Too Old	Too Old	Yes, 1 per site	Site(s) where original sample(s) was collected. Sample did not meet 30 hour time frame. Sample result Invalid.
INC	Inconclusive	Yes, 1 per site	Site(s) where original sample(s) was collected. Test results show too much chlorine. Sample result Invalid.
FPD	Form Post Dated	Yes, 1 per site	Site(s) where original sample(s) was collected. Error on time collected on sample form. Sample result Invalid.

\*Total Coliform Present and/or *E.coli* Present routine sample results require repeat sampling within 24 hours of receiving the positive result unless the collection and return of the repeat sample would be received by the ADH lab on Saturday or Sunday or a state holiday such that the sample would be "Too Old". In this case, the repeat samples are to be collected the next open business day. Samples are to be taken upstream, downstream, and at the original site. Upstream and downstream samples should be collected within 5 service connections of the original site. These locations should have been previously identified as repeat sample sites in your sample site plan. When this is not possible because of the layout of the system, samples should be collected at the original site and the 2 other samples either upstream or downstream. In the case of Non-community water systems with a single sample site, all resamples should be taken from that site.

\*\*A "Laboratory Accident" result is rare but when a sample is compromised during the analysis process the analysis is halted and the sample reported as a "Laboratory Accident" result. The Department regrets the accident happened but has no choice in requiring the water system to submit resamples.

\*\*\*Any invalidated repeat sample must be replaced from the original sample location within 24 hours of the receipt of the invalid result notice unless the collection and return of the sample would be received by the ADH lab on a Saturday or Sunday or a state holiday such that the sample would be "Too Old". In this case the replacement sample is to be collected the next open business day. This must continue until a valid sample result is obtained.

3.7.3.2 Failure to receive bottles from the Department does not relieve the water system of responsibility from complying with the sample requirements. If resample bottles are not received within three (3) working days after receiving positive or invalid sample results, the water system must take steps to obtain bottles. ADH Local Health Units maintain a supply of bottles. Other alternatives may be available. Contact your District staff for more information.

### 3.8 INVALIDATION OF POSITIVE SAMPLES

3.8.1 Total coliform positive samples may be invalidated only for the following reasons:

3.8.1.1 Laboratory error.

3.8.1.2 The State determines that the positive sample is the result of a domestic or plumbing problem such that the resample from the original location is still positive while the upstream and downstream resamples are negative. Documentation must be provided regarding the identified problem for State review for applicability of invalidation.

3.8.1.3 The State has substantial grounds to believe that the positive sample is due to a condition which does not reflect water quality in the distribution system and documents in writing the specific cause for that condition.

3.8.2 Replacement sample must be taken and the results of those samples used for MCL compliance determination.

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## 4 BACTERIOLOGICAL MONITORING REPORT

### 4.1 AUTHORITY

This section describes reporting of bacteriological sampling for compliance under the Revised Total Coliform Rule Summary which is promulgated under the National Primary Drinking Water Regulations (40 CFR Parts 141 and 142). Reporting regulations are also found in the Arkansas Rules and Regulations Pertaining to Public Water Systems (RRPWS). The operator of the system must complete and submit a monthly Bacteriological Monitoring Record (BMR). True and accurate reports must be submitted to the Arkansas Department of Health by the tenth of the following month (Arkansas Rules and Regulations Pertaining to Public Water Systems, Section VII. Operation, B. Records)

### 4.2 REPORTING / DOCUMENTATION

#### 4.2.1 Maintenance of Records

A copy of all reports and supporting documentation/sample results must be maintained in the water system's files for a minimum of five (5) years.

#### 4.2.2 Date Due at the Department

In order for the Department to determine that a water system is in compliance with the state and federal drinking water regulations, the completed form must be submitted to the Department's Engineering Section by the **10<sup>th</sup> day of the month** following the measurements. A Monitoring & Reporting violation of the Revised Total Coliform Rule will be determined when the water system has not submitted the reports by the 10<sup>th</sup> of the following month.

RETURN THE COMPLETED FORM TO:

**ENGINEERING SECTION, SLOT 37  
ARKANSAS DEPARTMENT OF HEALTH  
4815 W MARKHAM ST  
LITTLE ROCK, AR 72205  
FAX (501) 661-2032**

#### 4.2.3 Required Information

- 4.2.3.1 The Department supplies the systems with the bacteriological monitoring record forms (BMR) to report all required information. This includes the public water system name, PWS ID#, county, month/year, date/time, sample site ID#, type of sample, chlorine residual, sample results, lab # of sample, original lab number (for triggered resamples and GWR samples) date sample results received, and date of resample bottles received.
- 4.2.3.2 This form must document all samples taken from the public water system whether the samples are for compliance, triggered GWR, raw water, investigative or for boil orders.
- 4.2.3.3 For community and non-transient systems using water treated with a chemical disinfectant, failure to report chlorine residuals observed during bacteriological sampling will result in a violation and require public notification.
- 4.2.3.4 If resampling is performed, the bacteriological monitoring record (BMR) provides a place to document the date that the resample bottles were received. All resamples are to be collected on the same day and within 24 hours of the receipt of the sample results.
- 4.2.3.5 The licensed operator in responsible charge or the licensed operator of record for the water system must sign the form, certifying that the information presented on this form is true and accurate.

Illustration 4.1 shows an example of the BMR and provides guidance in completing the form.

Illustration 4.1 BMR Example and Guidance

**PUBLIC WATER SYSTEM - BACTERIOLOGICAL MONITORING RECORD**

Arkansas Department of Health / Engineering Section

PUBLIC WATER SYSTEM NAME \_\_\_\_\_ PWS ID # \_\_\_\_\_  
 MONTH \_\_\_\_\_ YEAR \_\_\_\_\_ COUNTY \_\_\_\_\_

DATE	SAMPLE SITE #	TYPE - REGULAR OR RESAMPLE	CHLORINE RESIDUAL MG/L	LAB RESULTS	Lab # (for Sample)	ORIGINAL Lab # (for Sample triggering resample)	DAY/DATE RESULTS RECEIVED	RESAMPLE CONTAINERS
								(Day/Date Received)

I certify that the information in this report is true and accurate to the best of my knowledge. I acknowledge that any knowingly false or misleading information may be punishable under 18 USC 1001 and other applicable laws.

Printed Name \_\_\_\_\_ Signature \_\_\_\_\_

Put any notes or comments on reverse side; make a copy for your records & return to address on reverse side.

4.2.3.6 The licensed operator in responsible charge or the licensed operator of record for the water system must sign the form, certifying that the information presented on this form is true and accurate.

## 5 MICROBIAL -- DISINFECTION BY- PRODUCT RULES

### 5.1 SURFACE WATER TREATMENT RULES

#### 5.1.1 AUTHORITY

This section outlines the monitoring, treatment technique and reporting responsibilities for water systems utilizing either a surface water source or a ground water source under the direct influence of surface water (GWUDI) sometimes referred to as a Subpart H – Public Water System. These monitoring requirements are authorized by both the Federal Safe Drinking Water Act, and recent additions thereto, and the Arkansas Rules and Regulations Pertaining to Public Water Systems (RRPPWS). The Federal requirements can be found in Code of Federal Regulations (CFR), 40 CFR Parts 9, 141, and 142. The state requirements can be found in Sections V, VI, VII, IX, X, XVIII, XXI and XXII of the RRPPWS and Rules and Regulations Pertaining to Water Operator Licensing, Sections III and V.

The **Surface Water Treatment Rule (SWTR)** was promulgated by the Environmental Protection Agency (EPA) on June 29, 1989. The Rule sets forth drinking water regulations requiring treatment of surface water and GWUDI sources. Regulations regarding filtration were specifically mandated in the amendments to the Safe Drinking Water Act in 1986.

The **Interim Enhanced Surface Water Treatment Rule (IESWTR)** was promulgated by the EPA on December 16, 1998. The Rule sets forth drinking water regulations requiring enhanced treatment and monitoring of large systems using surface water and GWUDI sources. This Rule builds upon the Surface Water Treatment Rule previously promulgated on June 29, 1989.

The **Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR)** was promulgated by the EPA on January 14, 2002. The Rule sets forth drinking water regulations requiring enhanced treatment and monitoring of small systems using surface water and GWUDI sources. This Rule builds upon the Surface Water Treatment Rule previously promulgated on June 29, 1989.

The **Filter Backwash Recycle Rule (FBRR)** was promulgated by the EPA on June 8, 2002. The Rule sets forth drinking water regulations for systems using surface water and GWUDI sources using conventional or direct filtration that recycles certain waste streams.

The **Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)** was promulgated by the EPA on January 5, 2006. The Rule sets forth drinking water regulations requiring enhanced treatment and monitoring of systems using surface water and GWUDI sources. The LT2ESWTR builds upon the SWTR, IESWTR, and LT1ESWTR by supplementing existing microbial treatment requirements for systems where additional public health protection is needed.

#### 5.1.2 SCOPE

All surface water systems and groundwater systems under the direct influence of surface water (i.e. Subpart H systems) must meet the requirements of the **SWTR**. In addition all Subpart H systems serving a retail population of at least 10,000 people must meet the requirements of the **IESWTR**, Subpart H systems serving a retail population of less than 10,000 people must meet the requirements of the **LT1ESWTR**, and all Subpart H system (regardless of size must meet the requirements of **LT2ESWTR**. (Note: The SWTR became effective on June 29, 1993; the IESWTR became effective on January 1, 2002; the LT1ESWTR became effective on January 1, 2005; and the LT2ESWTR became effective on January 5, 2006).

Groundwater systems which are found to be directly influenced by surface water must be in compliance with the SWTR and the IESWTR or LT1ESWTR within 18 months of being declared GWUDI.

The purpose of the **IESWTR** and the **LT1ESWTR** is to strengthen the existing SWTR by:

- A. Requiring a 99.0% (2-log) removal of Cryptosporidium,
- B. Strengthening turbidity performance standards to 0.3 NTU in 95% of the readings for the combined filter effluent and lowering the maximum allowed combined filter effluent turbidity to 1.0 NTU for most systems.
- C. Adding individual filter turbidity monitoring and reporting provisions for conventional or direct filtration plants. Filter(s) are required to be continuously monitored (by use of turbidimeter(s), and
- D. To establish provisions for disinfection profile(s) and benchmarking to assure continued levels of microbial protection where facilities take steps to comply with the new Disinfection By-Product standards (DBP).
- E. All Subpart H Systems using conventional or direct filtration that recycles filter backwash water, thickener supernatant and/or liquids from a solids dewatering process must meet the requirements of the **FBRR**.

The purpose of the **LT2ESWTR** is to reduce illness linked with the contaminant Cryptosporidium and other microbial pathogens in drinking water by requiring Subpart H systems to:

- A. Supplement existing regulations by targeting additional Cryptosporidium treatment requirements to higher risk systems.
- B. Reduce risks from uncovered finished water reservoirs and provisions to ensure that systems maintain microbial protection when they take steps to decrease the formation of disinfection byproducts that result from chemical water treatment.
- C. The LT2ESWTR is being promulgated simultaneously with the Stage 2 Disinfection Byproduct Rule to address concerns about risk tradeoffs between pathogens and DBPs.

### 5.1.3 ACRONYMS

ADH	– Arkansas Department of Health
CCP	– Composite Correction Program
CFE	– Combine Filter Effluent
CPE	– Comprehensive Performance Evaluation
CTA	– Comprehensive Technical Assistance
CT	– Residual Disinfectant <u>C</u> oncentration x Disinfectant Contact <u>T</u> ime
D/DBP	– Disinfectants/Disinfection By-Products
ES	-- Arkansas Department of Health, Division of Health, Engineering Section
EPA	– Environmental Protection Agency
FBRR	– Filter Backwash Recycle Rule
GAC	– Granular Activated Carbon
GWUDI	– Ground Water Under the Direct Influence of surface water
HAA5	– Haloacetic Acids (five)
ICR	– Information Collection Rule
IESWTR	– Interim Enhanced Surface Water Treatment Rule
IFE	– Individual Filter Effluent
LT1ESWTR	– Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR	– Long Term 2 Enhanced Surface Water Treatment Rule
MCL	– Maximum Contaminant Level

NTU	– Nephelometric Turbidity Unit
SWTR	– Surface Water Treatment Rule
TOC	– Total Organic Carbon
TT	– Treatment Technique
TTHM	– Total Trihalomethanes

#### 5.1.4 DEFINITIONS

**“Alternate Filtration Technologies”** – a filtration treatment process that uses technologies other than conventional / direct filtration, slow sand filtration or DE filtration. Alternate filtration technologies may include cartridge / bag filters or membrane filtration processes such as ultra-filtration, nano-filtration, or reverse osmosis.

**“Bin Classification”** - “Bin classification” means a category number, ranging from 1 to 4, which specify the required degree of *Cryptosporidium* treatment.

**“Coagulation”** – a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

**“Conventional filtration treatment”** – a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

**“Comprehensive Performance Evaluation”** -- (CPE) – a thorough review and analysis of a treatment plant’s performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant’s capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. A CPE consists of the following components; assessment of plant performance, evaluation of major unit processes, identification and prioritization of performance limiting factors, assessment of the applicability of comprehensive technical assistance, and preparation of a CPE report.

**“Cryptosporidium”** is a disease causing protozoan parasite found in humans, other mammals, birds, fish, and reptiles. The oocyst form of the organism is common in the environment and widely found in surface water supplies. Oocyst are highly resistant to standard disinfection practices, therefore physical removal is critical to control *Cryptosporidium*.

**“CT”** – the product of the residual disinfectant concentration (C) in mg/l and the disinfectant contact time (T) in minutes. The residual disinfectant is measured at the effluent from the basin or pipeline; the contact time is the time at which no more than 10% of the water would have exited a basin or pipeline.

**“Direct Filtration”** – a series of processes including coagulation and filtration, but excluding sedimentation, resulting in substantial particulate removal.

**“Disinfection”** – a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

**“Disinfection Profile”** – a summary of daily *Giardia lamblia* and virus inactivation through the treatment plant.

**“E. coli”** - *E. coli* (*Escherichia coli*) is one of several types of bacteria that normally inhabit the intestine of humans and animals.

**“Filter Profile”** – a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from start-up to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

**“Filter Backwash Water”** – a stream containing particles that are dislodged from filter media when water is forced back through a filter (backwashed) to clean the filter.

**“Filtration”** – the process for removing particulate matter from water through the use of porous media including, where appropriate, coagulation, flocculation, and sedimentation. Filtration processes recognized by the SWTR include conventional filtration, direct filtration, diatomaceous earth filtration, and slow sand filtration.

**“Giardia lamblia”** – a disease causing microorganism found in the feces of humans and a number of warm blooded animals, both domestic and wild. The cyst form of the organism can survive in the environment for several months. Drinking water supplies receiving sewage discharges and runoff from watersheds containing infected animals is the basis for the Surface Water Treatment Rule.

**“Groundwater Under the Direct Influence of Surface Water”** (GWUDI) – any water beneath the surface of the ground with significant occurrence of: insects or other macro organisms, algae, large diameter pathogens such as *Giardia lamblia* and *Cryptosporidium*, or the significant and relatively rapid shift in water characteristics such as turbidity, temperature, conductivity, or pH which correlates to climatological or surface water conditions.

**“Liquids from Dewatering Processes”** – a stream containing liquids generated from a unit used to concentrate solids for disposal.

**“Thickener supernatant”** – a stream containing the decant from a sedimentation basin, clarifier or other unit that is used to treat water, solids, or semi-solids from the primary treatment processes.

**“Sedimentation”** – a process for removal of solids by gravity or separation before filtration.

**“State”** – the delegated state primacy agency responsible for implementation of the National Primary Drinking Water Regulations. In Arkansas this is the Department of Health and Human Services; Division of Health; Engineering Section. Herein referred to as the Department.

**“Subpart H System”** – a public water system utilizing either a surface water source or a ground water source under the direct influence of surface water.

**“Uncovered finished water storage”** – a tank, reservoir, or other facility used to store water that will undergo no further treatment except residual disinfection and is open to the atmosphere. (Note: The phrase “open to the atmosphere” means facilities subject to potential contamination from rainfall, run off, animals, birds, insects or other sources. Covered tanks with properly constructed and maintained hatches, vents, and overflows are not considered “open to the atmosphere”.)

**“Virus”** – means a virus of fecal origin, which is infectious to humans by waterborne transmission.

#### **5.1.5 GENERAL REQUIREMENTS**

- A.** Surface water and groundwater systems under the direct influence of surface water must achieve at least 99.9% (3-log) removal and/or inactivation of *Giardia lamblia* cysts, and a 99.99% (4-log) removal and/or inactivation of enteric viruses prior to the first customer. Removal rates higher than this may be established by the State.
- B.** Surface water and ground water systems under the direct influence of surface water must establish, monitor, and report minimum disinfectant levels both at the treatment plant and in the distribution system; and must establish, monitor, and report turbidity levels of finished water.

- C. Each public water system using a surface water source or a ground water source under the direct influence of surface water must be operated by qualified personnel who meet the Water Operator Licensing requirements specified by the State. See “Licensed Water Operator Requirements” chapter of this summary.
- D. Achieve at least 99% (2-log) removal of *Cryptosporidium*. Removal rates higher than this may be established by the State.
- E. Monitor turbidity on each individual filter continuously. (Note: Systems serving a retail population less than 10,000 people with two or fewer filters may conduct continuous monitoring of the combined filter effluent in place of individual filter turbidity monitoring.)
- F. Community and non-transient non-community systems must develop a disinfection profile, calculate a disinfection benchmark and consult with the Department prior to making a significant change in disinfection process. (Under the IESWTR, this requirement only applied to certain systems. (The Department has completed this process for all applicable systems under the IESWTR and LT1ESWTR.)

**Additional requirements for surface water systems and groundwater systems under the direct influence of surface water by the LT2ESWTR:**

- A. Collect source water samples and have those samples analyzed for *E. coli* and/or *Cryptosporidium*.
- B. Provide additional treatment for *Cryptosporidium* if your source water *Cryptosporidium* results exceed certain levels.
- C. If source water for *Cryptosporidium* exceed certain levels then use one of the options from the LT2ESWTR “Toolbox” to meet any additional *Cryptosporidium* treatment requirements.
- D. Meet new requirements to protect uncovered finished water storage reservoirs.
- E. All systems must develop a disinfection profile and a disinfection benchmark and notify the State prior to making a significant change in disinfection.

**Filter Backwash Recycle Rule**

- A. Systems that recycle must submit a recycle notification to the Department by **December 8, 2003**.
- B. Systems that recycle must collect and retain recycle flow information on file for review and evaluation by the Department beginning **June 8, 2004**.
- C. Systems that recycle must return recycle flows to the head of the plant by **June 8, 2004**, or
- D. For systems that require capital improvements to return recycle flows to the head of the plant, all capital improvements must be completed by **June 8, 2006**.

**Surface Water Influence Determination**

- A. The State must evaluate each well source serving a public water system to determine whether or not the well is directly influenced by surface water. The Department’s

determination may be based on area geology, well construction, field evaluation, historical water quality data, and/or analysis of current water quality parameters.

- B. Wells serving community water systems were required to have been evaluated by June 29, 1994. Wells serving non-community water systems were required to have been evaluated by June 29, 1999. An evaluation of new wells is made after being placed into service.
- C. If determined to be under the direct influence of surface water, a system must comply with the interim monitoring and disinfection requirements the Department deems necessary until filtration is installed. (Note: Systems declared GWUDI have 18 months to achieve full compliance with the SWTR, IESWTR or LT1ESWTR, as appropriate.)

## 5.1.6 TREATMENT TECHNIQUE REQUIREMENTS

### 5.1.7.1 Turbidity

**Failure to meet any requirement of this section is a treatment technique violation.**

#### **Conventional and Direct Filtration**

- A. The filtered water turbidity requirements of the SWTR have been replaced by the IESWTR and LT1ESWTR.
- B. The combined filter effluent (CFE) turbidity level must be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month. The CFE turbidity level must at no time exceed 1 NTU.

(Note: A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the State.)

#### **Other Treatment Technologies**

##### **A. Slow Sand Filtration and Diatomaceous Earth Filtration**

The combined filter effluent (CFE) turbidity level must be less than or equal to 1 NTU in at least 95% of the measurements taken each month. The CFE turbidity level must at no time exceed 5 NTU. (Note: The Department has not to date approved either slow sand filtration or diatomaceous earth filtration for any Subpart H system.)

##### **B. Cartridge or Bag filtration**

Systems using either a cartridge or bag filter element with a pore size rating of one (1) micron or less absolute must conform to a combined filter effluent turbidity of 1 NTU or less in 95% of the measurements and must never exceed 5 NTU.

Systems using either a cartridge or bag filter element with a pore size rating other than one (1) micron or less absolute must conform to a combined filter effluent turbidity of 0.3 NTU or less in 95% of the measurements and must never exceed 1 NTU.

Membrane filtration (such as ultra-filtration, nano-filtration, reverse osmosis) - The combined filter effluent (CFE) turbidity level must be less than or equal to 0.3 NTU in 95% of the measurements taken each month. The CFE turbidity level must at no time exceed 1 NTU.

**Note:** For additional information concerning Alternate Filtration Technologies, contact the Engineering Section or refer to the "Small System Compliance Technology List for the

Surface Water Treatment Rule” -- Guidance, EPA 815-R-97-002 on the internet at <http://www.epa.gov/ogwdw/regs/swtrlist.html> .

#### **5.1.7.2 Disinfection**

**Failure to meet any requirement of this section is a treatment technique violation.**

The water system must comply with the log removal/inactivation rate for *Giardia lamblia* cysts and enteric viruses established by the State.

The residual disinfectant concentration in the water entering the distribution system cannot be less than 0.2 mg/l for more than 4 hours.

The residual disinfectant concentration measured in the distribution system cannot be undetectable in more than 5% of the samples each month, for any two consecutive months that the water system serves water to the public. Heterotrophic plate counts by a certified laboratory of less than or equal to 500/ml are deemed equal to a detectable residual concentration.

The IESWTR, LT1ESWTR, and LT2ESWTR additionally require that surface water and GWUDI systems must comply with the requirements for disinfection profiling and benchmarking discussed in Section 5.1.8.

#### **5.1.7.3 Treatment Techniques Options to Comply with *Cryptosporidium***

Under the LT2ESWTR Subpart H systems collect source water samples and have those samples analyzed for *E. coli* and if results exceed trigger levels they have to test for *Cryptosporidium*.

If source monitoring for *E. coli* and *cryptosporidium* exceed specified concentration levels systems are placed in “Bins” consisting of Bin 1 through Bin 4. The Bin 1 facilities are where the *Cryptosporidium* <0.075 oocyst/L. In Arkansas only 7 systems are in Bin 2 (*Cryptosporidium* >0.075 but < 1.0 oocyst/L). The Bin 2 systems must provide a 1-log additional treatment for *Cryptosporidium*.

Bin 2 systems select from a wide range of treatment and management strategies in “microbial toolbox” to meet their additional treatment requirements.

5.1.7.4

**MICROBIAL TOOLBOX SUMMARY OPTIONS and TREATMENT CREDITS**

<b>Source Protection and Management Toolbox Options</b>	
1. Watershed control program	0.5-log Credit
2. Alternative source/intake management	No prescribed credit
<b>Pre Filtration Toolbox Options</b>	
3. Presedimentation basin with coagulation	0.5-log Credit
4. Two stage Lime softening	0.5-log Credit
5. Bank Filtration	0.5-log Credit
<b>Treatment Performance Toolbox Options</b>	
6. Combined filter performance	0.5-log Credit
7. Individual filter performance	0.5-log Credit
8. Demonstration of performance	Credit based upon demonstration
<b>Additional Filtration Toolbox Options</b>	
9. Bag or cartridge filters (individual filters)	Up to 2-log Credit
10. Bag or cartridge filters (in series)	Up to 2-log Credit
11. Membrane filtration	Log credit equivalent to removal efficiency
12. Second stage filtration	0.5-log Credit
13. Slow sand filters	2.5-log Credit or 3-log credit
<b>Inactivation Toolbox Options</b>	
14. Chlorine dioxide	Log credit based upon measured CT
15. Ozone	Log credit based upon measured CT
16. UV	Log credit based upon validated UV dose

The Microbial Toolbox Options that will be used most often to get 1-log of credit are expected to be:

Microbial Toolbox Option 6 - The combined filter effluent (CFE) turbidity level must be less than or equal to 0.15 NTU in at least 95% of the measurements taken each month.

Microbial Toolbox Option 7 – The Individual filter effluent (IFE) turbidity level must be less than or equal to 0.15 NTU in at least 95% of the measurements taken each month in each filter and is never greater than 0.3 NTU in two consecutive measurements in any filter.

For information concerning the other Toolbox Options please contact:

**ADH-Engineering Section**

**Source Protection Program (501) 661-2623**

Lyle Godfrey (email: [Lyle.Godfrey@arkansas.gov](mailto:Lyle.Godfrey@arkansas.gov))

Ken Bown (email: [Ken.bown@arkansas.gov](mailto:Ken.bown@arkansas.gov))

**5.1.7.4 Recycle Flows - FBRR**

All surface water and/or GWUDI systems using conventional or direct filtration treatment that recycles filter backwash water, thickener supernatant, or liquids from a dewatering process must return these flows to the head of the plant by June 8, 2004. If capital improvements are required to modify the recycle location to meet this requirement, all capital improvements must be completed by June 8, 2006. Failure to return recycle flows by the dates indicated is a treatment technique violation.

**5.1.7 DISINFECTION PROFILING AND BENCHMARKING**

The IESWTR, LT1ESWTR, and LT2ESWTR requires all community and non-transient non-community systems public water systems that use surface water sources and/or groundwater sources under the direct influence of surface water to comply with disinfection profiling and benchmarking requirements.

**5.1.8.1 Developing the Disinfection Profile :**

A disinfection profile is developed by compiling Giardia lamblia log inactivation computed over a 12-month period. Calculations are calculated daily (for systems serving a retail population of 10,000 people or greater) and weekly (for systems serving a retail population of less than 10,000 people). In addition, a disinfection profile for virus log inactivation must be developed for PWSs that use either chloramines or ozone for primary disinfection. The log inactivation values are calculated using measurements of operational data collected during peak-hourly flows.

A PWS that has 3 years of existing operational data may use these data to develop a disinfection profile as long as the State has determined that these data are substantially equivalent to data that would be collected under the IESWTR.

**Note: Systems must keep the disinfection profile on file to be reviewed during its Sanitary Survey.**

**5.1.8.2 Disinfection Benchmarking**

Any system that decides to make a significant change to its disinfection practice must consult with the State prior to making such change. Significant changes to disinfection practice include but are not limited to:

- Changes to the point of disinfection.
- Changes to the disinfectant(s) used in the treatment plant.
- Changes to the disinfection process.

Any system that is modifying its disinfection practice must calculate its disinfection benchmark (i.e. the lowest monthly average inactivation value based on the Disinfection

Profile) and must submit the following information to the State as a part of its consultation process:

- A description of the proposed change.
- The disinfection profile for *Giardia lamblia* (and, if necessary, viruses) and the disinfection benchmark.
- An analysis of how the proposed change will affect the current levels of disinfection.

The disinfection benchmark is determined as follows:

- Using the data collected to develop the disinfection profile, determine the average *Giardia lamblia* inactivation (and if required the average virus inactivation) for each calendar month by dividing the sum of all the inactivations for that month by the number of values calculated for that month.
- The disinfection benchmark is the lowest monthly average value of the twelve months
- The State will provide technical assistance on a case by case basis for systems required to development a disinfection profile and benchmark.

## **5.1.8 MONITORING REQUIREMENTS**

### **5.1.9.1 Turbidity**

#### **CFE Monitoring**

Monitoring requirements for CFE for all Subpart H systems are required at least every 4 hours. Systems must conduct continuous monitoring, or collect grab samples to meet the equivalent of samples collected every 4 hours.

#### **IFE Monitoring**

##### **A. Greater than 10,000 Population**

Monitoring requirements for surface water and GWUDI systems serving a retail population of at least 10,000 people using conventional or direct filtration treatment include:

Continuous monitoring of turbidity on each individual filter effluent line must be performed. The system must record the results of individual filter monitoring every 15 minutes. Turbidimeters must be calibrated using the procedure specified by the manufacturer. (Note: It is recommended that turbidimeters be calibrated using primary standards on a frequency of at least once every 3 months.)

If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every 4 hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

##### **B. Less than 10,000 Population**

Monitoring requirements for surface water and GWUDI systems serving a retail population of less than 10,000 people using conventional or direct filtration treatment are the same as >10,000 population. However systems with two or fewer filters may conduct continuous monitoring of the combined filter effluent turbidity in place of individual filter effluent turbidity monitoring.

**5.1.9.2 Disinfection**

For systems serving **greater than 3,300 populations**, the residual disinfection concentration of the water entering the distribution system must be monitored continuously, and the lowest value recorded each day. If there is a failure in the continuous monitoring equipment, grab sampling may be conducted every 4 hours, but for no more than 5 working days following the failure of the equipment (i.e. the monitoring equipment must be repaired or replaced within 5 working days).

Systems serving **3,300 population or less** may take grab samples in lieu of continuous monitoring in accordance with the table below. Samples must be spaced evenly throughout the period(s) of the day when water enters the distribution system. If at any time the chlorine residual concentration falls below 0.2mg/l, grab samples must be taken at least every 4 hours until a residual greater than 0.2mg/l is established. The number of required samples based on population served is shown below.

**Sampling Requirements by Population Served**

<u>Population</u>	<u>Samples/day</u>
≤ 500	1
501 – 1000	2
1001 – 2500	3
2501 – 3300	4

The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliform bacteriological samples are collected. Heterotrophic plate count analysis by a certified laboratory may be utilized in lieu of residual disinfectant concentration.

**5.1.9.3 CT**

Monitoring for disinfectant residuals, pH, and temperature for each basin where a disinfection credit is desired must be conducted at a frequency and with a protocol established by the State in order to determine compliance for CT.

**5.1.9 REPORTING AND RECORDKEEPING REQUIREMENTS**

**5.1.10.1 Turbidity**

**A. Combined Filter Effluent (CFE)**

**Applies to all Subpart H systems (Populations greater than 10,000 and less than 10,000).**

Results of CFE turbidity measurements must be reported to the State within 10 days after the end of the month on the report form supplied by the State.

The system must inform the State as soon as possible, but no later than the end of the next business day if at any time the turbidity exceeds:

- One (1) NTU for systems utilizing conventional filtration or direct filtration, or
- The maximum level set by the State for systems utilizing another State approved technology (see section 5.1.7.1).

Monitoring results must be reported to the State within 10 days after the end of each month the systems serves water to the public on the forms provided by or in a format approved by the State. These reports must include the following:

- The total number of CFE effluent turbidity measurements taken during the month.
- The number and percentage of CFE turbidity measurements taken during the month which are greater than:
  - Three tenths (0.3) NTU for systems using conventional or direct filtration,  
or
  - The turbidity performance standards set by the State for systems utilizing another State approved technology.
- The date and value of any CFE turbidity measurements taken during the month which exceeds:
  - One (1) NTU for systems utilizing conventional filtration or direct filtration,  
or
  - The maximum level set by the State for systems utilizing another State approved technology.

#### **B. Individual Filter Effluent (IFE)**

The system must certify that IFE turbidity monitoring was conducted during the month. Systems must report IFE turbidity measurements within 10 days after the end of the month the system serves water to the public.

##### **Greater than 10,000 Populations**

For any IFE that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system must report the filter number, turbidity measurements, and the date(s) on which the exceedance occurred. In addition, the system must either conduct a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for abnormal filter performance) and either report that the profile has been produced or report the obvious reason for exceedance.

For any IFE that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart, **at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken off line**, the system must report the filter number, turbidity measurements, and the date(s) on which the exceedance occurred. In addition, the system must conduct a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for abnormal filter performance) and report that the profile has been produced or report the obvious reason for exceedance. (Note: "At the end of the first four hours" means turbidity readings taken at 4 hours and 4 hours and 15 minutes after the filter is placed back into service.)

For any IFE that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of **three consecutive months**, the system must report the filter number, turbidity measurements, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-

assessment was conducted, the date that it was triggered and the date that it was completed. The following components must be contained in the self-assessment:

- Assessment of filter performance,
- Development of a filter profile,
- Identification and prioritization of factors limiting filter performance,
- Assessment of the applicability of corrections, and
- Preparation of a filter self-assessment report.

For any IFE that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of **two consecutive months**, the system must report the filter number, turbidity measurement, and the date(s) on which the exceedance occurred. In addition the system must arrange for a CPE evaluation by the State or a third party approved by the State no later than **30** days following the exceedance. The evaluation must be completed and submitted to the State no later than **90** days following the exceedance.

### **Less than 10,000 Populations**

For any IFE (or the CFE for systems with 2 filters that monitor the combined filter effluent in lieu of individual filters) that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system must report the filter number, turbidity measurements, the date(s) on which the exceedance occurred and, if known, the cause for the exceedance.

For any IFE (or the combined filter effluent for systems with 2 filters that monitor the combined filter effluent in lieu of individual filters) that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of **three consecutive months**, the system must report the filter number, turbidity measurements, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter (or both filters, if the system monitors the CFE in lieu of IFE) within 14 days of the exceedance and report that the self-assessment was conducted, the date that it was triggered and the date that it was completed. The following components must be contained in the self-assessment:

- Assessment of filter performance,
- Development of a filter profile,
- Identification and prioritization of factors limiting filter performance,
- Assessment of the applicability of corrections, and
- Preparation of a filter self-assessment report.

For any IFE (or the CFE for systems with 2 filters that monitor the combined filter effluent in lieu of individual filters) that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of **two consecutive months**, the system must report the filter number, turbidity measurement, and the date(s) on which the exceedance occurred. In addition the system must arrange for a CPE evaluation by the State or a third party approved by the State no later than **60** days following the exceedance. The evaluation must be completed and submitted to the State no later than **120** days following the exceedance. (Note: If a CPE has been conducted by the State or a third party approved by the State within 12 months prior to the exceedance or the system and State are jointly participating in a Comprehensive Technical Assistance Project, a new CPE will not be required.)

Systems must maintain results of individual filter monitoring for at least three years. These records must be readily available for State representatives to review during sanitary surveys or other visits.

Systems using cartridge / bag filtration must document and report the pore size rating of the cartridge / bags used during the month on forms provided by the Department.

### **C. Cryptosporidium Bin 2 Facilities**

Applies to PWS in Bin 2 proposing to get 1-log of credit using the Treatment Performance Toolbox Options 6 and 7. Results of CFE and IFE turbidity measurements must be reported to the State within 10 days after the end of the month on the report form supplied by the State.

#### **CFE**

Microbial Toolbox Option 6 - Requires the combined filter effluent (CFE) turbidity level must be less than or equal to 0.15 NTU in at last 95% of the measurements taken each month.

#### **IFE**

Microbial Toolbox Option 7 requires the Individual filter effluent (IFE) turbidity level must be less than or equal to 0.15 NTU in at last 95% of the measurements taken each month in each filter and is never greater than 0.3 NTU.

### **5.1.10.2 Disinfection**

Results of residual disinfection measurements on water entering the distribution system from the treatment plant, and at the total coliform sampling points in the distribution system must be reported to the State within 10 days after the end of the month on the report forms supplied by the State.

If at any time the residual disinfectant concentration in water entering the distribution system from the treatment plant falls below 0.2 mg/L, the system must notify the State as soon as possible, but no later than the end of the next business day. The system must also notify the State within the same time frame whether or not the residual was restored to 0.2 mg/L or higher within 4 hours.

### **5.1.10.3 Disinfection Profiling and Benchmarking**

Systems required to develop a disinfection profile must retain disinfection profile data indefinitely on the forms provided by or in a format approved by the State for review as a part of sanitary surveys conducted by the State. Disinfection profile data includes monitoring data necessary to determine the total log inactivation throughout the plant collected on a daily basis for large systems and weekly basis for small systems during peak hourly flow.

### **5.1.10.4 Recycle Flows – FBRR**

- A. Recycle Notification:** A system must notify the Department in writing by December 8, 2003, if the system recycles filter backwash water, thickener supernatant, or liquids from the dewatering processes. This notification must include, at a minimum, the following information:
- A plant schematic showing the origin of all flows that are recycled, the hydraulic conveyance used to transport them, and the location where they are reintroduced back into the treatment plant.

- Typical recycle flow in gallons per minute, the highest observed plant flow experienced in the previous year (gpm), design flow for the treatment plant (gpm), and the Department approved operating capacity for the plant.

**B. Recycle Flow Information:** Beginning June 8, 2004, the system must collect and retain indefinitely recycle flow information, as indicated below, on file for review and evaluation by the Department.

- A copy of the recycle notification and information submitted to the Department detailed above.
- A list of all recycle flows and the frequency with which they are returned.
- The average and maximum backwash flow rate through the filter and the average and maximum duration of the filter backwash process in minutes.
- The typical filter run length and a written summary of how filter run length is determined.
- The type of treatment provided for the recycle flow.
- Data on the physical dimensions of the equalization and /or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used and average dose and frequency of use, and frequency at which solids are removed, if applicable.

#### **5.1.10.5 CT**

Results of monitoring for disinfectant residuals, pH, and temperature for the purposes of CT determination must be reported on the form provided by the State within 10 days after the end of the month.

#### **5.1.10.6 Disease Outbreak**

The water system must report to the State as soon as possible, but no later than the end of the next business day, any disease outbreak potentially attributed to the water system.

### **5.1.10 ANALYTICAL TECHNIQUES**

#### **5.1.11.1 Turbidity**

Turbidity must be measured in accordance with EPA Method 180.1, or Method 214A in the 16<sup>th</sup>, or later, edition of Standard Methods for the Examination of Water and Wastewater, 1985, American Public Health Association.

A system that uses lime softening may acidify representative samples prior to analysis. Contact the Engineering Section for detailed instructions regarding the acidification of samples.

#### **5.1.11.2 Disinfectants**

**A. Chlorine.** Residual concentration for free and combined chlorine must be measured by one of the following methods listed in the 16<sup>th</sup>, or later, edition of Standard Methods for the Examination of Water and Wastewater, 1985, American Public Health Association. Residuals may also be measured using colorimetric field test kits, provided the kits utilize DPD.

Standard Method 408C (APHA, 1985) – Amperometric Titration Method.  
Standard Method 408D (APHA, 1985) – DPD Ferrous Titrimetric Method.

Standard Method 408E (APHA, 1985) – DPD Colorimetric Method.

Note: The numbering nomenclature in later editions of Standard Methods has been changed. Below, for your reference, is a list of the acceptable methods taken from the 19<sup>th</sup> edition of Standard Methods.

Standard Method 4500-CI D (APHA, 1995) -- Amperometric Titration Method.  
Standard Method 4500-CI E (APHA, 1995) -- Low Level Amperometric Titration Method.  
Standard Method 4500-CI F (APHA, 1995) -- DPD Ferrous Titrimetric Method.  
Standard Method 4500-CI G (APHA, 1995) -- DPD Colorimetric Method.  
Standard Method 4500-CI H (APHA, 1995) -- Syringaldazine (FACTS).  
Standard Method 4500-CI I (APHA, 1995) -- Iodometric Electrode.

**B. Ozone.** Residual concentration for ozone must be measured by Method 4500-O3 of the 17<sup>th</sup> edition of Standard Methods for the Examination of Water and Wastewater, 1989, American Public Health Association.

**C. Chlorine Dioxide.** Residual concentration of chlorine dioxide must be measured by one of the following methods listed in the 16<sup>th</sup>, or later, edition of Standard Methods for the Examination of Water and Wastewater.

Method 410B (APHA, 1985) -- Amperometric Method.  
Method 410C (APHA, 1985) -- DPD Method.

Note: The numbering nomenclature in later editions of Standard Methods has been changed. Below, for your reference, is a list of the acceptable methods taken from the 19<sup>th</sup> edition of Standard Methods.

Standard Method 4500-CIO2 D (APHA, 1995) – DPD Method.  
Standard Method 4500-CIO2 E (APHA, 1995) – Amperometric Titration Method.

### 5.1.11.3 pH

Measurements for pH must be in accordance with Method 423 in the 16<sup>th</sup>, or later, edition of Standard Methods for the Examination of Water and Wastewater. (Note: This method requires the use of a specific ion electrode for pH measurements, colorimetric methods are not acceptable.)

### 5.1.11.4 Temperature

Measurements for temperature must be in accordance with Method 212 in the 16<sup>th</sup>, or later, edition of Standard Methods for the Examination of Water and Wastewater.

### 5.1.11 DISCRETIONARY ITEMS

The Surface Water Treatment Rule requires State discretion in a number of areas in how the regulation is implemented. Following is a list of the major areas of discretion and describes in general how the State will address that discretion. The final determination on all discretionary items is made by the State.

#### 5.1.12.1 Level of Treatment

All systems have been assigned a minimum treatment level of 99.0% (2-log) removal of *Cryptosporidium* oocysts, 99.9% (3 log) removal/inactivation of *Giardia lamblia* cysts and a 99.99% (4 log) removal/inactivation for viruses.

#### 5.1.12.2 Treatment Plant Efficiency

Assigning log removal credit.

- A. Plant efficiency will be assigned based on a comprehensive evaluation conducted by the State of the plant design, operation, and possibly the turbidity removal efficiency of the plant. Removal credit for *Giardia lamblia* based on the evaluation will range from 1.5 to 3.0 log cyst. Removal credit for *Cryptosporidium* based on the evaluation will range from 1.5 to 2.0 log oocyst. However, regardless of the evaluation rating, a system meeting the turbidity standards of the IESWTR and LT1ESWTR will receive a 2.0 log oocyst removal credit. A copy of the evaluation criteria can be furnished upon request.
- B. Systems that dispute the level assigned by the State may undertake a program to demonstrate the plant's performance independent of the State's evaluation. The program design would be subject to State approval and could include particle counting, particulate analysis, and/or other challenge studies. The final decision on the plant's efficiency will be determined by the State.
- C. Not less than a 0.5 log inactivation of cysts and 2-log inactivation of viruses must be achieved with a disinfectant regardless of the treatment plant credit determination. Water systems that have demonstrated potential disinfection by-products violation (due to this requirement) may request a temporary reduction of this minimum treatment level provided the following criteria are met:
  - The source water has a total coliform geometric mean of 50 colonies per 100ml or less from a representative series of samples.
  - The treatment plant has been assigned or can demonstrate a 3.0 log *Giardia lamblia* cyst credit removal.

#### 5.1.12.3 Alternate Turbidity Level for Lime Softening Plants

Systems that utilize lime softening may apply to the State for alternate exceedance levels if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

#### 5.1.12.4 Alternate Technologies.

Water systems desiring an alternative treatment technology must demonstrate that the technology is capable of meeting the appropriate log removal / inactivation requirements and turbidity removal. This capability will be based on the technology demonstrating the removal rates through turbidity data, particle counts, challenge studies, particulate analysis, or other appropriate means.

#### 5.1.12.5 CT Determination.

Contact time for a basin or clear well will be established by tracer test or by calculated methods conducted by the water system or its consultant and approved by the State. Flow in pipelines will be assumed to be plug flow. A procedures manual for detention time determination and a paper detailing a series of case studies for tracer tests are available from the State. Tracer tests have proven extremely useful in not only determining  $T_{10}$  values but also in evaluating treatment plant hydraulics, distribution of flow, and short circuiting problems. For those reasons, tracer tests are the preferred alternate.

The State will, however, consider calculated  $T_{10}$  values for sedimentation basins and filters, and possibly clearwells, provided it can be shown that the units are properly designed, functioning correctly, and operated within design parameters.

Calculated sedimentation values will be dependent on the type of basin (conventional vs. up-flow), must exclude entry and exit chambers or zones, and would be approved for no more than 50% of the hydraulic detention time. Calculated filter  $T_{10}$  values must exclude the volume of the media and must be based on volume above the media or contact time in piping

and flumes. Clearwell values generally must be determined by tracer tests. Exceptions may be allowed if:

- A. The basin was constructed utilizing extensive baffling, or
- B. Where the system wishes to claim credit for no more than 5% to 10% of the hydraulic detention time, the influent and effluent lines are properly situated (opposite sides of the basin), and the length to width ratio suitable.

In any case, where calculated values are proposed, verification and approval for the particular basin(s) must be obtained in writing from the State.

If the water system fails to establish a contact time through tracer tests or calculated methods, the State, depending on resources, will either conduct its own tracer test or assign a detention time value based on basin configuration and theoretical hydraulic detention time.

#### **5.1.12.6 CT Disinfection Profiling and Benchmarking**

Systems that meet the following criteria must comply with the requirements of Section 5.1.10.3 -- Disinfection Profiling and Benchmarking.

- A. Subpart H water systems serving a retail population of at least 10,000 people.
- B. Subpart H water systems that have no retail, but wholesale water to a population base of at least 10,000 people.
- C. Subpart H water systems serving a retail or wholesale population of less than 10,000 people.

Subpart H water systems that serve a retail or wholesale population, as addressed in Section 5.1.12.6(A) above, must monitor for TTHM and HAA5 as required by the Disinfectant / Disinfection By-Product Rule. If the system's running annual average for TTHM  $\geq 0.064$  mg/l and / or the running annual average for HAA5  $\geq 0.048$  mg/l, the system may be required to complete a disinfection profile. The disinfection profile should be completed within 15 months of the completion of the applicability monitoring.

#### **5.1.12.7 CT Surface Water Influence Determination.**

The determination of whether groundwater is directly influenced by surface water will be based on one or more of the following: well construction, subsurface geology and hydrogeology, proximity to surface waters, well yield, historical water quality data, site inspections, and water quality evaluations for inorganic parameters and microscopic particulate analysis.

Water systems that dispute a determination that their well is directly influenced by surface water must undertake a study of the area hydrogeology and a sampling program whose parameters, frequency, and duration are concurred with by the State. Final determination of whether a source is directly influenced by surface water will be by the State.

#### **5.1.12 COMPLETION AND SUBMITTAL OF REPORT FORMS**

The operator of a water system utilizing a surface water source or a ground water source influenced by surface water (GWUDI) must complete and submit monthly Operation and Chemical Report Forms in order to document compliance with the Surface Water Treatment Rules (SWTRs). The Department supplies water systems with the forms to report the required information. All applicable fields should be completed; however, this section will discuss those sections which must be completed in order to document compliance with the requirements of the SWTR, IESWTR, LT1ESWTR, and LT2ESWTR. For each month

completed operation report forms must be submitted to and received by the State by the 10<sup>th</sup> of the following month.

**5.1.13.1 Combined Filter Effluent Turbidity**

The finished water turbidity must be recorded at least once every four hours that the plant is in operation. For systems serving 500 people or less, one reading per day must be recorded if the Department approves reduced turbidity monitoring. A section on the front page is provided which provides a blank for each four-hour period during each day of the month. A finished water turbidity reading must be provided. The headings for this section, which is found on the front page of the report, appear below.

Turbidity (NTU)							
Raw	Set	Finished AM			Finished PM		
		12 -- 4	4 -- 8	8 -- 12	12 -- 4	4 -- 8	8 -- 12

**5.1.13.2 Combined Filter Effluent Turbidity Summary**

On the front page of the Operations and Chemical Report Form is found a small section where turbidity records are summarized. The operator must indicate the Total # of turbidity readings for the month, the number of turbidity readings > 1 NTU, the number of turbidity readings > 0.3 NTU and calculate the percentage of readings that were above 0.3 NTU and indicate them here. The headings for this section appear below/Left. In addition, a revised Operations and Chemical Report Form is provided (below/right) to address Bin 2 LT2 provisions.

Total # of Finished Turbidity Values	
Number > 1 NTU	
Number > 0.3 NTU	
Percent > 0.3 NTU	

Total # of Finished Turbidity Values			
# > 1 NTU			
#>0.3 NTU		# >0.15 NTU	
% >0.3 NTU		% >0.15 NTU	

**5.1.13.3 Level Effluent Chlorine**

The water system is required to maintain a minimum chlorine residual of 0.2 ppm in the finished treated water leaving the plant and entering the distribution system. The system must report the lowest measured chlorine residual for each day. For systems serving above 3300 population, the effluent chlorine residual must be continuously monitored. The headings for this section, which is found on the front page of the report, appear below.

Effluent Cl <sub>2</sub> (ppm)	Chlorite Monitoring (For Systems Using Chlorine Dioxide)		D A T E
	Lowest Measured Value*	Entry Point Chlorite (ppm)	
			1
			2

**5.1.13.4 Effluent Chlorine If Below 0.2 ppm**

When the effluent chlorine residual falls below 0.2 ppm, the system is required to report effluent chlorine residual measurements at four-hour intervals until a 0.2 ppm residual is

restored. The section for reporting these readings is found on the front page of the Operation and Chemical Report Forms. The headings for this section appear below.

\* 4 Hr Effluent Residual Monitoring Required if < 0.2 PPM

Date	AM			PM		
	12 -- 4	4 -- 8	8 -- 12	12 -- 4	4 -- 8	8 -- 12

### 5.1.13.5 CT Compliance

Water quality data must be supplied which documents the systems compliance with the CT (concentration x contact time) requirements of the SWTR. Each water system has a letter from the Department which indicates the approved CT criteria for the particular treatment facility and the specific basins which are being credited towards this requirement. The water operator must familiarize himself/herself with this correspondence before taking recordings and completing this section. The disinfectant residuals leaving the basins and clearwell used for compliance must be recorded. Also, pH, flow rate, and water temperature recordings are required. It may be in the interest of the water operator to consult with the personnel of the Engineering Section when completing this section for the first time. However, the operator needs to clearly understand that this section must be completed for every day that the plant is operating. The headings for this section appear below.

					(RECORD DISINFECTANT INJECTION POINTS BELOW)								
DATE	Peak Raw / Plant Flow Rate (GPM)	Peak High Service Flow Rate (GPM)	Minimum Clearwell Level* (FEET)	Water Temp. Degrees (C / F)	#1:			#2:		#3:		Was compliance met this date? (Yes / No)	If no, within 12 hours? (Yes / No)
					(RECORD MONITORING LOCATIONS BELOW)								
					pH	Residual (mg/l)	pH	Residual (mg/l)	pH	Residual (mg/l)			
1													
2													

### 5.1.13.6 Operator Certification

The SWTR requires that the treatment facility be operated by qualified personnel. The Department requires that the operators be licensed through the Water Operator Certification Program. On the front page of the operation and chemical report form, a block is provided for the operator to list their name, license number, position, and to sign the form. By signing the form, the operator is certifying that the information presented on the form is correct. This block appears below.

Comments: \_\_\_\_\_

---

I certify that the information in this report is true and accurate to the best of my knowledge. I acknowledge that any knowingly false or misleading information may be punishable under 18 USC 1001 and other applicable laws.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Printed Name \_\_\_\_\_ Position \_\_\_\_\_ License # \_\_\_\_\_

**5.1.13.7 Chlorine/Bacteriological Monitoring Record**

The SWTR requires the water system to record and report the chlorine residuals in the distribution system at the same place and time that bacteriological samples are collected. These chlorine residuals must be recorded on the Bacteriological Monitoring Report (BMR) and this report must be submitted to the Department each month. The headings for that form appear below. See Section 4 on the proper manner to complete this form.

<b>PUBLIC WATER SYSTEM - BACTERIOLOGICAL MONITORING RECORD</b>						
Arkansas Department of Health / Division of Engineering						
PUBLIC WATER SYSTEM NAME _____				PWS ID # _____		
MONTH _____	YEAR _____		COUNTY _____			
DATE	SAMPLE SITE #	TYPE - REGULAR OR RESAMPLE	CHLORINE RESIDUAL MG/L	LAB RESULTS	DAY/DATE RESULTS RECEIVED	RESAMPLE CONTAINERS  (Day/Date Received)

**5.1.13.8 Individual Filter Turbidity Monitoring**

**A. Greater than 10,000 Populations**

The IESWTR requires systems serving a retail population of at least 10,000 people to continuously monitor each individual filter for turbidity. The water system must report that each filter was monitored continuously, any trigger level exceedance and follow-up actions (i.e. obvious reason, filter profile, filter self assessment, CPE, etc.). This must be recorded on the Individual Filter Turbidity Monitoring Report (IFMR) and this report must be submitted to the Department each month. The form has four sections to track different trigger levels and examples are provided on the following page.

## INDIVIDUAL FILTER TURBIDITY MONITORING REPORT

(Systems Serving  $\geq 10,000$  People)

REPORT FOR PWS \_\_\_\_\_ MONTH \_\_\_\_\_ YR \_\_\_\_\_

PWS ID # \_\_\_\_\_ WTP NAME \_\_\_\_\_

List Filter # of each filter in service during the month. \_\_\_\_\_  
 List Filter # of filter(s) **not** continuously monitored using on-line turbidity meter. \_\_\_\_\_ (Attach reason.)

Did you have a failure of any on-line turbidity meter? Yes \_\_\_\_\_ No \_\_\_\_\_ Number of days off-line? \_\_\_\_\_

**Note:** If individual filter turbidity monitor fails you must conduct grab samples every four hours and record results.  
 The individual filter turbidity monitor must be repaired and placed back on-line within 5 working days.

Were any trigger levels exceeded? Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, complete the applicable sections below.

Filter #	Value in NTU of Turbidity Measurements > 1.0 in 2 Consecutive Measurements Taken 15 Minutes Apart -- <u>During Normal Operation</u>			Conduct a Filter Profile Within 7 Days of the Exceedance(s) or Determine Obvious Reason for Abnormal Filter Performance  <b>(Attach Filter Profile Report or Attach Report Outlining Obvious Reason for Exceedance)</b>	
	Date	Initial Reading Exceeding 1.0	2nd Reading Exceeding 1.0	Date Profile Conducted	Date Obvious Reason for Exceedance Determined

Filter #	Value in NTU of Turbidity Measurements > 1.0 in 2 Consecutive Measurements Taken 15 Minutes Apart -- <u>At Any Time In Each of Three Consecutive Months</u>				Conduct a Self-Assessment of the Filter Within 14 Days of the Exceedance	
	Turbidity Exceeding 1.0 NTU					
	1st Month		2nd Month		3rd Month	
	Date	Value	Date	Value	Date	Value

Filter #	Value in NTU of Turbidity Measurements > 0.5 in 2 Consecutive Measurements Taken 15 Minutes Apart -- <u>At the End of the First 4 Hours of Continuous Filter Operation After the Filter Has Been Backwashed or Otherwise Taken Off Line</u>			Conduct a Filter Profile Within 7 Days of the Exceedance(s) or Determine Obvious Reason for Abnormal Filter Performance  <b>(Attach Filter Profile Report or Attach Report Outlining Obvious Reason for Exceedance)</b>	
	Date	Initial Reading Exceeding 0.5	2nd Reading Exceeding 0.5	Date Profile Conducted	Date Obvious Reason for Exceedance Determined

Filter #	Value in NTU of Turbidity Measurements > 2.0 in 2 Consecutive Measurements Taken 15 Minutes Apart -- <u>At Any Time In Each of Two Consecutive Months</u>				Within 30 Days of the Exceedance the System Must Arrange Through the ADH to Have a CPE Conducted  <b>(Within 90 Days of the Exceedance a CPE Must Be Completed and the CPE Report Submitted to the ADH)</b>	
	Turbidity Exceeding 2.0 NTU					
	1st Month		2nd Month		Date CPE Arrangements Completed	
	Date	Value	Date	Value	Date CPE Completed and Report Submitted to ADH	

The above figures are true and accurate to the best of my knowledge.  
 SIGNATURE \_\_\_\_\_ POSITION \_\_\_\_\_

Make a copy for your records & return by the 10th of the following month to: Division of Engineering, Slot 37  
 4815 W. Markham, Little Rock, AR 72205-3867

**B. Less Than 10,000 Populations**

The LT1ESWTR requires systems serving a retail population of less than 10,000 people to continuously monitor each individual filter for turbidity. (Note: If the system has no more than two filters, then the CFE must be continuously monitored). The water system must report that continuous monitoring was conducted, any trigger level exceedance and follow-up actions (i.e. obvious reason, filter self assessment, CPE, etc.). This must be recorded on the Individual Filter Turbidity Monitoring Report (IFMR) and this report must be submitted to the Department each month. The form has two sections to track different trigger levels and examples are provided below.

**INDIVIDUAL FILTER TURBIDITY MONITORING REPORT**  
(Systems Serving <10,000 People)

REPORT FOR PWS \_\_\_\_\_ MONTH \_\_\_\_\_ YR \_\_\_\_\_  
PWS ID # \_\_\_\_\_ WTP NAME \_\_\_\_\_  
Total # of Filters at WTP \_\_\_\_\_ Total # of Filters in service during the month \_\_\_\_\_  
Note: Individual Filters must be monitored continuously; results recorded every 15 minutes and results maintained for 3 years.

Provide the filter # of each filter in service during the month.  
List Filter # of any filter(s) not continuously monitored using on-line turbidity meter. \_\_\_\_\_ (Attach reason.)  
Did you have a failure of any on-line turbidity meter? Yes \_\_\_\_\_ No \_\_\_\_\_ Number of days off-line? \_\_\_\_\_  
Note: If individual filter turbidity monitor fails you must conduct grab samples every four hours and record results.  
The individual filter turbidity monitor must be repaired and placed back on-line within 14 days.

Did any trigger levels occur? Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, complete the applicable sections below.

Filter #	Trigger Level 1 Turbidity Value(s) of > 1.0 NTU in 2 Consecutive Measurements Taken 15 Minutes Apart <small>(Note record all trigger values below, even if for one or two months.)</small>						Conduct a Self-Assessment of the Filter(s) Within 14 Days of an Exceedance <small>(Note: An Exceedance exists when Trigger Level 1 occurs in Each of <u>Three</u> Consecutive Months)</small>
	Turbidity Exceeding 1.0 NTU						(Attach Report of Filter Assessment) <small>(Note: Systems with two filters that monitor CFE in lieu of individual filters must conduct a self assessment on both filters.)</small>
	1st Month		2nd Month		3rd Month		
	Date	Value	Date	Value	Date	Value	Date Completed

Filter #	Trigger Level 2 Turbidity Value(s) of > 2.0 NTU in 2 Consecutive Measurements Taken 15 Minutes Apart <small>(Note record all trigger values below, even if for one month.)</small>				Within 60 Days of the Exceedance the System Must Arrange Through the ADH to Have a CPE Conducted <small>(Note: An Exceedance exists when the Trigger Level 2 occurs in Each of <u>Two</u> Consecutive Months)</small>	
	Turbidity Exceeding 2.0 NTU				(Within 120 Days of the Exceedance a CPE Must Be Completed and the CPE Report Submitted to the ADH)	
	1st Month		2nd Month			
	Date	Value	Date	Value	Date CPE Arrangements Completed	Date CPE Completed and Report Submitted to ADH

The above figures are true and accurate to the best of my knowledge.

SIGNATURE \_\_\_\_\_ POSITION \_\_\_\_\_

Make a copy for your records & return by the 10th of the following month to:  
ARKANSAS DEPT. OF HEALTH  
ENGINEERING SECTION  
4815 W MARKHAM ST - Slot 37  
LITTLE ROCK, AR 72205-3867

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**5.1.13.9 Alternate Filtration Technologies – Cartridge / Bag Filtration**

Systems using an alternate filtration technology in which the filtration process provided for the purpose of achieving cysts removal is either a cartridge or bag filter must complete an additional report form entitled "Supplemental Surface Water Treatment Report Form: Alternate Filtration Technologies – Cartridge / Bag Filtration". This form must be submitted to the Department each month. An example is provided below.

<b>SUPPLEMENTAL SURFACE WATER REPORT FORM</b>	
ALTERNATE FILTRATION TECHNOLOGIES -- CARTRIDGE / BAG FILTRATION	
ARKANSAS DEPARTMENT OF HEALTH -- DIVISION OF ENGINEERING	
<b>REPORT FOR PWS</b> _____	<b>MONTH</b> _____ <b>YR</b> _____
<b>PWS ID #</b> _____	<b>WTP NAME</b> _____
Provide the following information for each <b>final</b> cartridge / bag filter used.	
Total number of final filter housings in use during the month:	_____
Number of cartridges / bags in each final filter housing:	_____ Cartridge(s)      _____ Bag(s)
Were identical cartridges / bags used in each final filter housing?	_____ No      _____ Yes
<b>If "No", submit a copy of this form for each different type final cartridge / bag used during the month.</b>	
List each Individual Final Filter Name or Number:	_____
<b>Manufacturer of Cartridge / Bag:</b> _____	
<b>Cartridge / Bag Product Name:</b> _____	
Manufacturer's Code or Model Number: _____	
Micron Rating: _____ Micron Nominal <b>or</b> _____ Micron Absolute	
NSF Standard 61 Certified: _____ No      _____ Yes	
NSF Standard 53 Certified: _____ No      _____ Yes	
Date Cartridge / Bag Replaced: _____	
(List Name / Number of each final filter and the date the cartridge(s)/bag(s) were replaced.)	
Was replacement cartridge(s)/bag(s) the same as listed above?      _____ No      _____ Yes	
If No, provide the following information on the replacement cartridge(s)/bag(s).	
Replacement Cartridge / Bag for Filter Number(s) _____	
<b>Manufacturer of Cartridge / Bag:</b> _____	
<b>Cartridge / Bag Product Name:</b> _____	
Manufacturer's Code or Model Number: _____	
Micron Rating: _____ Micron Nominal <b>or</b> _____ Micron Absolute	
NSF Standard 61 Certified: _____ No      _____ Yes	
NSF Standard 53 Certified: _____ No      _____ Yes	
Comments: _____	
_____	
The above information is true and accurate to the best of my knowledge.	
Print Name: _____	Treatment License #: _____
Signature: _____	Date: _____
Make a copy for your records & return by the 10th of the following month to:	
Division of Engineering , Slot 37 4814 W. Markham, Little Rock, AR 72205-3867	
Alternate Filtration Technologies - Supplemental Report Form	

#### **5.1.13.10 Cryptosporidium Bin 2 Facilities**

Systems that are in Bin 2 and demonstrating combined and individual filter performance under the Microbial Toolbox Options for CFE and IFE must complete an additional report form entitled "Bin 2 Demonstration of Treatment Performance Under LT2ESWTR". Results of CFE and IFE turbidity measurements must be reported to the State within 10 days after the end of the month on the report form supplied by the State. This form must be submitted to the Department each month. An example is provided below.

**BIN 2 DEMONSTRATION OF TREATMENT PERFORMANCE UNDER LT2ESWTR  
INDIVIDUAL FILTER TURBIDITY MONITORING REPORT**

PWS NAME \_\_\_\_\_ MONTH \_\_\_\_\_ YR \_\_\_\_\_  
PWS ID # \_\_\_\_\_ WTP NAME \_\_\_\_\_

Day	Reporting of individual filter effluent (IFE) turbidity measurements recorded every 15 minutes on water that enters into the clearwell. <small>(Additional forms are required for systems with greater than 4 filters.)</small>											
	Filter # _____			Filter # _____			Filter # _____			Filter # _____		
	Total # Values	# of Values > 0.15 NTU	Did the IFE exceed 0.3 NTU in any two consecutive 15-minute measurements? (Yes / No)	Total # Values	# of Values > 0.15 NTU	Did the IFE exceed 0.3 NTU in any two consecutive 15-minute measurements? (Yes / No)	Total # Values	# of Values > 0.15 NTU	Did the IFE exceed 0.3 NTU in any two consecutive 15-minute measurements? (Yes / No)	Total # Values	# of Values > 0.15 NTU	Did the IFE exceed 0.3 NTU in any two consecutive 15-minute measurements? (Yes / No)
1	96	5	yes									
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12		5										
13												
14	45											
15												
16	50	5										
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
<b>Total</b>	<b>191</b>	<b>15</b>										
<b>% &gt; 0.15</b>		<b>7.9%</b>										

Note: The %>0.15 is calculated by dividing the total # of measurements >0.15 NTU by the total # of measurements .

**Attach Reason, if known, for exceedances above the 0.15 NTU and / or 0.3 NTU Individual Filter Turbidity Levels.**

I certify the information in this report is true and accurate to the best of my knowledge. I acknowledge that any knowingly false or misleading information may be punishable under the 18USC 1001 and other applicable laws.

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Make a copy for your records and return by the tenth of the following month to : Arkansas Department of Health, Engineering Section (MS37)  
4815 West Markham, Little Rock, AR 72205-3867

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## 5.2 RULES STAGE I AND II DISINFECTION BY-PRODUCT RULES

### 5.2.1 AUTHORITY

This section outlines the maximum residual disinfectant levels, maximum contaminant levels, and treatment technique requirements established by the Stage I and II Disinfectant By-Product Rules as well as the monitoring, reporting and record keeping responsibilities for water systems. These monitoring requirements are authorized by both the Federal Safe Drinking Water Act, and recent additions thereto, and the Arkansas Rules and Regulations Pertaining to Public Water Systems (RRPPWS). The Federal requirements can be found in Code of Federal Regulations (CFR), 40 CFR Parts 9, 141, and 142. The state requirements can be found in Sections V, VII, X, XVII, XVIII, and XXI of the RRPPWS and Rules and Regulations Pertaining to Water Operator Licensing, Sections III and V.

### 5.2.2 INTRODUCTION

The **Stage I Disinfectants and Disinfection Byproducts (Stage I DBP)** was promulgated by the Environmental Protection Agency on December 16, 1998. The Rule sets forth drinking water regulations designed to reduce exposure to disinfection byproducts (DBPs). All community water systems (CWS) and non-transient non-community water systems (NTNCWS) that add a chemical disinfectant and all transient non-community water systems (TNCWS) using chlorine dioxide are affected by this Rule. It establishes maximum residual disinfectant levels (MRDLs), maximum contaminant levels (MCLs) and, for some systems, treatment techniques (TTs) for the control of total organic carbon (TOC). This Rule builds upon the Trihalomethane Regulations and is designed to work in concert with the Surface Water Treatment Rules to control DBPs while maintaining microbial protection for surface and ground water under the direct influence of surface water (GWUDI) systems.

The **Stage 2 Disinfectants and Disinfection By-Products Rule (Stage 2 DBP)** was promulgated by the Environmental Protection Agency on January 4, 2006. All CWS and NTNCWS that deliver water that has been treated with a chemical disinfectant are affected by this Rule. This Rule builds upon the Stage I DBP rule. It established criteria for distribution monitoring site selection, a requirement for each site to comply with the Total Trihalomethane (TTHM) and Haloacetic Acid (HAA5) MCL calculated as locational running annual average (LRAA), and established an Operational Evaluation Level (OEL) and reporting requirement.

### 5.2.3 SCOPE

The Stage 1 and Stage 2 DBP rules are now in effect. The effective dates of the Stage 2 DBP rule is based upon the size of the largest system within a combined distribution system (CDS). Consecutive or wholesale systems that are part of a combined distribution system must comply with the same date as the system with the earliest compliance date in the combined distribution system.

- A. Systems serving at least 100,000 people were required to complete their monitoring plans by January 1, 2009 and begin compliance monitoring by April 1, 2012.
- B. Systems serving 50,000 – 99,999 people were required to complete their monitoring plans by July 1, 2009 and begin compliance monitoring by October 1, 2012.
- C. Systems serving 10,000 – 49,999 people were required to complete their monitoring plans by January 1, 2010 and begin compliance monitoring by October 1, 2013.
- D. Community water systems serving less than 10,000 people were required to complete their monitoring plans by July 1, 2010.

- E. Systems serving less than 10,000 people that did not have to monitor for Cryptosporidium were required to begin compliance monitoring by October 1, 2013.
- F. Systems serving less than 10,000 people that did have to monitor for Cryptosporidium were required to begin compliance monitoring by October 1, 2014.

In order to reduce exposure to disinfection byproducts (DBPs) the Rules:

- A. Established MCLs for total trihalomethanes (TTHM) and for five haloacetic acids (HAA5).
- B. Established MCLs for Bromate (for systems using ozonation) and Chlorite (for systems using chlorine dioxide).
- C. Established a Treatment Technique (TT) for the removal of natural organic material, or Total Organic Carbon (TOC), from the source water. This TT applies only to surface and GWUDI systems that use conventional filtration treatment.
- D. Established a Maximum Residual Disinfectant Level (MRDL) for all CWS and NTNCWS systems and for all TNCWS that add chlorine dioxide to the water.
- E. Established an Operational Evaluation Level (OEL) and reporting requirement for TTHM and HAA5.

#### 5.2.4 ACRONYMS

ADH	– Arkansas Department of Health
CDS	– Combined Distribution System
CWS	– Community Water System
DOC	– Dissolved Organic Carbon
DBP	– Disinfection By-product
DBPR	– Disinfection By-product Rule
EPA	– Environmental Protection Agency
GWUDI	– Groundwater Under the Direct Influence of surface water
HAA5	– Haloacetic Acids (five)
LRAA	– Locational Running Annual Average
MCL	– Maximum Contaminant Level
MRDL	– Maximum Residual Disinfectant Level
NTNCWS	– Non-transient, Non-Community Water System
OEL	– Operational Evaluation Level
PODR	– Point of Diminishing Return
RAA	– Running Annual Average
SUVA	– Specific Ultraviolet Absorption
SWTR	– Surface Water Treatment Rule
TNCWS	– Transient Non-community Water System
TOC	– Total Organic Carbon
TT	– Treatment Technique
TTHM	– Total Trihalomethanes

## 5.2.5 DEFINITIONS

**“Conventional filtration treatment”** – a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

**“Combined Distribution System”** – an interconnected distribution system consisting of the distribution systems of wholesale systems and the consecutive systems that receive finished water.

**“Disinfection”** – a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

**“Dual Sample Set”** – a set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5.

**“Enhanced Coagulation”** – the addition of coagulant for improved removal of total organic carbon (TOC) by conventional filtration treatment.

**“Enhanced Softening”** – the addition of sufficient softening agent for improved removal of total organic carbon (TOC) by conventional filtration treatment.

**“Groundwater Under the Direct Influence of Surface Water” (GWUDI)** – any water beneath the surface of the ground with significant occurrence of: insects or other macroorganisms, algae, large diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*, or the significant and relatively rapid shift in water characteristics such as turbidity, temperature, conductivity, or pH which correlates to climatological or surface water conditions.

**“Haloacetic Acids (HAA5)”** – the sum of the concentrations, in milligrams per liter, of the five haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid).

**“Locational Running Annual Average”** – the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

**“Maximum Contaminant Level (MCL)”** – the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

**“Maximum Residual Disinfectant Level (MRDL)”** – the maximum level of a disinfectant added for water treatment that **may not be exceeded** at the consumer’s tap without an unacceptable possibility of adverse health effects. MRDLs are enforceable in the same manner as maximum contaminant levels under the Safe Drinking Water Act. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs, operators may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections.

**“Operational Evaluation Level”** – the sum of the two previous quarters’ TTHM or HAA5 results plus twice the current quarter’s TTHM or HAA5 results, divided by 4 to determine an average. If the resulting average at any monitoring location is >80 ug/L for TTHM or >60 ug/L for HAA5 the OEL has been exceeded.

**“Point of Diminishing Return (PODR)”** – the point at which further coagulant addition yields an insignificant amount of additional TOC removal. More specifically, the PODR is the point at which TOC removal is less than 0.3 mg/L for an increase in coagulant dosage of 10 mg/L and remains less than 0.3 mg/L TOC removal for subsequent increases in coagulant dosage of 10 mg/L.

**“Running Annual Average”** – the average of sample analytical results of all samples taken by the system during the previous four calendar quarters.

**“Specific Ultraviolet Absorption (SUVA)”** – is an indicator of the humic content of water. It is calculated by dividing a sample’s ultraviolet absorption at a wavelength of 254 nanometers ( $UV_{254}$ ) by its concentration of dissolved organic carbon (DOC) in mg/L.

**“State”** – the delegated state primacy agency responsible for implementation of the National Primary Drinking Water Regulations. In Arkansas that is the Department of Health; Engineering Section.

**“Subpart H System”** – A public water system that utilizes surface water or ground water under the direct influence of surface water as its primary source.

**“Total Trihalomethanes (TTHM)”** – the sum of the concentration, in milligrams per liter, of the four trihalomethane compounds: chloroform (trichloromethane), dibromochloromethane, bromodichloromethane and bromoform (tribromomethane).

#### **5.2.6 GENERAL REQUIREMENTS**

Systems must modify their practices, if necessary, to comply with the maximum contaminant levels for disinfection by-products and the maximum residual disinfectant levels established by the DBP Rules. Surface and GWUDI systems using conventional filtration treatment must meet the treatment techniques for total organic carbon. Systems must develop monitoring plans and monitor for disinfection by-product and residual disinfectant levels as summarized below.

- A. All CWS and NTNCWS that deliver water that has been treated with a chemical disinfectant must monitor and comply with MCLs for TTHMs and HAA5s in the distribution system. The Stage 2 DBPR requires affected systems to comply with the TTHM and HAA5 MCLs based on a LRAA of samples collected at each monitoring location in the distribution system.
- B. All CWS and NTNCWS that deliver water that has been treated with a chemical disinfectant must monitor for and comply with the MRDLs for disinfectant residuals in the distribution system. The Stage 1 DBPR requires affected systems to comply with the MRDL for Chlorine and Chloramines based on a RAA of all samples collected in the distribution system.
- C. All water systems using chlorine dioxide as a disinfectant or oxidant must monitor for and comply with the MCL for chlorite and the MRDL for chlorine dioxide at the entry point to the distribution system and in the distribution system. The Stage 1 DBPR requires affected systems to comply with the chlorite MCL based on an arithmetic average of each three-sample set collected in the distribution system. The Stage 1 DBPR requires affected systems to comply with the MRDL for chlorine dioxide at the entrance to the distribution system based on two consecutive daily samples and in the distribution system based on any sample in a three-sample set.
- D. CWS and NTNCWS using ozone must monitor for and comply with the MCL for bromate at the entry point to the distribution system. The Stage 1 DBPR requires affected systems to comply with the bromate MCL based on a RAA of all samples collected at the entry point to the system.
- E. CWS and NTNCWS using surface and/or GWUDI sources using conventional filtration treatment must monitor TOC and alkalinity in the raw water and TOC in the finished water and comply with the treatment technique for the removal of TOC.

- F. Each CWS and NTNCWS must be operated by a qualified operator who meets the licensing requirements of the Arkansas Rules and Regulation Pertaining to Water Operation Licensing.
- G. Systems may increase residual disinfectant levels for chlorine or chloramines, but not chlorine dioxide, in the distribution system to a level and for a time necessary to protect public health. Such increase in residual disinfectant levels will not trigger a MRDL violation provided the increase was to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connections.

**5.2.7 MAXIMUM CONTAMINANT LEVELS**

The Stage I DBPR set MCLs for the disinfectant by-products listed below.

<u>Disinfection By-Product</u>	<u>MCL</u>
Total Trihalomethanes (TTHM)	0.080 mg/L
Haloacetic Acids (HAA5)	0.060 mg/L
Chlorite	1.0 mg/L
Bromate	0.010 mg/L

**5.2.8 MAXIMUM RESIDUAL DISINFECTANT LEVELS**

The Stage I DBPR set MRDL for the three chemical disinfectants listed below.

<u>Disinfectant</u>	<u>MRDL</u>
Chlorine (as Cl <sub>2</sub> )	4.0 mg/L
Chloramines (as Cl <sub>2</sub> )	4.0 mg/L
Chlorine Dioxide (as ClO <sub>2</sub> )	0.8 mg/L

**5.2.9 TREATMENT TECHNIQUE FOR THE REMOVAL OF TOTAL ORGANIC CARBON (TOC)**

The Stage I DBPR established a treatment technique for the removal of total organic carbon (TOC). Surface or GWUDI systems using conventional filtration treatment must practice enhanced coagulation or enhanced softening to achieve increased removal of TOC through the treatment process.

**5.2.9.1 Enhanced Coagulation / Enhanced Softening**

- A. Surface and GWUDI systems using conventional filtration treatment must operate with enhanced coagulation or enhanced softening to achieve TOC percent removal levels unless the system meets at least one of the alternative compliance criteria outlined in the DBPR. The alternative compliance criteria are discussed in Section 5.2.9.1(D).
- B. Enhanced Coagulation and Enhanced Softening – **Step 1** Requirements
  - 1. Surface and GWUDI systems using conventional filtration treatment must achieve the percent reduction of TOC between its raw water source and combined filter effluent as indicated the following table, unless the Department approves the system’s request for alternative minimum TOC removal (Step 2) requirements.

**Step1 -- Required Removal of TOC by  
Enhanced Coagulation & Enhanced Softening**

Source Water TOC (mg/L)	Source Water Alkalinity (mg/L as CaCO <sub>3</sub> )		
	0 to 60	>60 to 120	>120 <sup>(1)</sup>
% TOC Removal Required			
>2.0 – 4.0	35.0 %	25.0%	15.0%
>4.0 – 8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

<sup>(1)</sup> Plants practicing enhanced softening must meet the TOC requirements in this column.

2. Systems that cannot achieve the Step 1 TOC removal requirements as indicated above due to water quality parameters or operational constraints, must apply to the Department within three months of the failure to achieve the removal requirements for approval of alternative minimum TOC requirements (i.e. Step 2 removal requirements – see Section 5.2.9.1.C).
  - a) If approved the Step 2 removal requirements may be made retroactive (for one quarter) for the purposes of determining compliance.
  - b) Until the Department approves alternative Step 2 removal requirements, the system must continue to meet the Step 1 removal requirements.

C. Enhanced Coagulation and Enhanced Softening – **Step 2** Requirements

Because of unique water conditions, some plants may not be able to achieve the Step 1 TOC removal rates. Such system will be required to conduct bench- or pilot-scale testing in order to establish alternate TOC removal requirements.

1. Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH such that an incremental addition of 10 mg/L of alum (as aluminum), or an equivalent amount of ferric salt, results in a TOC removal of  $\leq 0.3$  mg/L. The percent removal of TOC at this point on a “TOC removal versus coagulant dose” curve defines, if approved by the State, the minimum TOC removal required by the system and is referred to as the Point of Diminishing Returns (PODR).
  - a) Once approved by the State the Step 2 TOC removal requirements will supercede the Step 1 TOC removal requirements.
  - b) Step 2 TOC removal requirements will be effective until such time as the Department approves a new value based on the results of a new bench- or pilot-scale test.
  - c) Failure to achieve Department set alternative minimum removal requirements will be a violation.

D. Alternative Compliance Criteria for Enhanced Coagulation and Enhanced Softening

1. Source water TOC < 2.0 mg/L: -- If the source water contains less than 2.0 mg/L of TOC, calculated quarterly as a running annual average, the system is in compliance with the treatment technique requirements. Additionally, for individual months in which raw water TOC is less than 2.0 mg/L, compliance with the treatment technique has been achieved for that month.

2. Treated water TOC < 2.0 mg/L: -- If treated water contains less than 2.0 mg/L TOC, calculated quarterly as a running annual average, the system is in compliance with the treatment technique requirements. Additionally, for individual months in which treated water TOC is less than 2.0 mg/L, compliance with the treatment technique has been achieved for that month.
3. Raw water SUVA  $\leq$  2.0 L/mg-m: -- If the raw water specific ultraviolet absorption (SUVA) is less than or equal to 2.0 L/mg-m prior to any treatment, calculated quarterly as a running annual average, the system is in compliance with the treatment technique requirements. Additionally, for individual months in which raw water SUVA is less than or equal to 2.0 L/mg-m, compliance with the treatment technique has been achieved for that month.
4. Treated water SUVA  $\leq$  2.0 L/mg-m: -- If the treated water SUVA is less than or equal to 2.0 L/mg-m prior to any treatment, calculated quarterly as a running annual average, the system is in compliance with the treatment technique requirements. Additionally, for individual months in which treated water SUVA is less than or equal to 2.0 L/mg-m, compliance with the treatment technique has been achieved for that month.
5. Raw water TOC < 4.0 mg/L; Raw water alkalinity > 60mg/L (as CaCO<sub>3</sub>); TTHM  $\leq$  40  $\mu$ g/L; HAA5  $\leq$  30  $\mu$ g/L: -- Because it is more difficult to remove appreciable amounts of TOC from waters with higher alkalinity and lower TOC levels, systems that meet the above criteria are in compliance with the treatment technique requirements. All of the parameters are based on running annual averages computed quarterly.

Systems that have made a clear and irrevocable financial commitment (prior to the system's effective compliance date for the DBPR) to use technologies that will limit TTHM and HAA5 to 40  $\mu$ g/L and 30  $\mu$ g/L, respectively, do not have to practice enhanced coagulation, provided that the TOC and alkalinity levels of this criterion are met.

6. TTHM  $\leq$  40  $\mu$ g/L and HAA5  $\leq$  30  $\mu$ g/L with only chlorine for disinfection: -- Systems that use only free chlorine as their primary disinfectant and for maintenance of a residual in the distribution system and achieve the stated TTHM and HAA5 levels are in compliance with the treatment technique. The TTHM and HAA5 levels are based on running annual averages, computed quarterly. TTHM and HAA5 compliance samples are used to qualify for this alternative performance criterion.

#### E. Additional Alternative Compliance Criteria for Softening Systems

1. Compliance is achieved if, softening results in lowering the treated water alkalinity to less than 60 mg/L (as CaCO<sub>3</sub>) measured monthly and calculated quarterly as a running annual average.
2. Compliance is achieved if, softening results in removing at least 10 mg/L of magnesium hardness measured monthly and calculated quarterly as a running annual average.

**NOTE:** Systems practicing enhanced softening that cannot achieve the Step 1 TOC removals required by Section 5.2.9.1(B1) may use the alternative compliance criteria above to achieve compliance.

### 5.2.9.2 TOC Removal Compliance

A. Surface and GWUDI systems using conventional filtration must begin compliance determinations with the enhanced coagulation requirements of the DBPR beginning twelve months after the effective date of the Rule. The Department will make compliance determinations and advise the system on a quarterly basis.

1. Compliance calculations will be made on quarterly basis and consist of the following steps.

a) Determine the actual monthly TOC percent removal by the following formula:

$$[1 - (\text{Treated water TOC} / \text{Source water TOC})] \times 100$$

b) Determine the required monthly TOC percent removal based on Step 1 criteria or on Step 2 criteria if approved.

c) Determine the TOC removal ratio by dividing the actual TOC percent removal by the required TOC percent removal.

Note: In any month that this result is less than 1.00, a system may apply a value of 1.00 for that month if any one of the following criteria is met.

i. The treated or finished water TOC level is less than 2.0 mg/L.

ii. The treated or finished water SUVA level is less than or equal to 2.0 L/mg-m.

iii. A system practicing softening that removes at least 10 mg/L magnesium hardness (as CaCO<sub>3</sub>).

iv. A system practicing enhanced softening lowers alkalinity below 60 mg/L.

d) Average the results in Step (c) above for the previous 12 months to obtain the TOC Removal Ratio - Running Annual Average (RAA). If the average is greater than or equal to 1.00 the system is in compliance.

2. Systems with a TOC Removal Ratio - RAA of less than 1.00, based solely on Step 1 TOC removal requirements, must apply to the Department for alternative Step 2 removal requirements for use in compliance determinations.

### 5.2.10 MONITORING REQUIREMENTS

All systems affected by the DBP Rules must develop a monitoring plan and maintain it on file for review by the Department during sanitary surveys and by the general public as requested. All monitoring must be in accordance with approved monitoring plans. (Note: The Department will assist systems with the development of a monitoring plan to assure compliance with the DBP Rules.)

The Department will provide sample collection and analysis for TTHM, HAA5, TOC, bromate, and distribution system chlorite samples. The water system must conduct sample collection and analysis for disinfectant residuals and, where applicable, entry point chlorite and source water alkalinity samples.

A. The DBP Rules' monitoring requirements for various system types and sizes are listed beginning on the next page.

- B. The Stage 2 DBP Rule requires systems on quarterly monitoring to collect dual sample sets every 90 days.
- C. TTHM and HAA5 Monitoring may not be reduced if a surface or GWUDI system's source water TOC > 4.0 mg/L based on a RAA. The Stage 2 DBP Rule allows a system to reduce TTHM and HAA5 monitoring any time the TTHM and HAA5 LRAA is ≤40 ug/L and ≤30 ug/L respectively at all monitoring locations. Additional requirements are listed below.

**Stage 2 DBP  
Total Trihalomethane (TTHM) and Haloacetic Acid (HAA5)**

<b>System Type</b>	<b>Routine Monitoring</b>	<b>Reduced Monitoring</b>
Surface and GWUDI serving 250,000 – 999,999 people	Twelve (12) dual sample sets <b>per quarter</b> . Six (6) dual sample sets taken at high TTHM locations and 6 dual sample sets taken at high HAA5 locations.	Monitoring can be reduced to 6 dual sample sets <b>per quarter</b> at the locations with the 3 highest TTHM and 3 highest HAA5 LRAAs.  To remain on reduced monitoring: 1) TTHM and HAA5 LRAAs must be ≤40 ug/L and ≤30 ug/L respectively. 2) Source water TOC must be ≤4.0 mg/L based on a RAA.
Surface and GWUDI serving 50,000 – 249,999 people	Eight (8) dual sample sets <b>per quarter</b> . Four (4) dual sample sets taken at high TTHM locations and 4 dual sample sets taken at high HAA5 locations.	Monitoring can be reduced to 4 dual sample sets <b>per quarter</b> at the locations with the 2 highest TTHM and 2 highest HAA5 LRAAs.  To remain on reduced monitoring: 1) TTHM and HAA5 LRAAs must be ≤40 ug/L and ≤30 ug/L respectively. 2) Source water TOC must be ≤4.0 mg/L based on a RAA.
Surface and GWUDI serving 10,000 – 49,999 people	Four (4) dual sample sets <b>per quarter</b> . Two (2) dual sample sets taken at high TTHM locations and 2 dual sample sets taken at high HAA5 locations.	Monitoring can be reduced to 2 dual sample sets <b>per quarter</b> at the locations with the highest TTHM and highest HAA5 LRAAs.  To remain on reduced monitoring: 1) TTHM and HAA5 LRAAs must be ≤40 ug/L and ≤30 ug/L respectively. 2) Source water TOC must be ≤4.0 mg/L based on a RAA.
Surface and GWUDI serving 3,301-9,999 people	Two (2) dual sample sets <b>per quarter</b> . One (1) dual sample set taken at the high TTHM location and 1 dual sample set taken at the high HAA5 location.	Monitoring can be reduced to 2 dual sample sets <b>per year</b> . One (1) dual sample set at the location and during the quarter with the highest single TTHM measurement and 1 dual sample set at the location and during the quarter with the highest single HAA5 measurement.  To remain on reduced monitoring: 1) TTHM and HAA5 sample results must be ≤60 ug/L and ≤45 ug/L respectively. 2) Source water TOC must be ≤4.0 mg/L based on a RAA.

Surface and GWUDI serving 500-3,300 people	Two (2) dual sample sets <b>per quarter</b> . One (1) dual sample set taken at the high TTHM location and 1 dual sample set taken at the high HAA5 location.	Monitoring can be reduced to 1 TTHM sample <b>per year</b> at the location and during the quarter with the highest single TTHM measurement and 1 HAA5 sample <b>per year</b> at the location and during the quarter with the highest single HAA5 measurement. One (1) dual sample set <b>per year</b> if the highest TTHM and HAA5 measurements occurred at the same location and quarter.  To remain on reduced monitoring: <ol style="list-style-type: none"> <li>1) TTHM and HAA5 sample results must be <math>\leq 60</math> ug/L and <math>\leq 45</math> ug/L.</li> <li>2) Source water TOC must be <math>\leq 4.0</math> mg/L based on a RAA.</li> </ol>
Surface and GWUDI serving < 500 people	Two (2) dual sample sets <b>per year</b> . One (1) dual sample set taken at the high TTHM location and 1 dual sample set taken at the high HAA5 location.	Monitoring may not be reduced.
Ground water serving 10,000-99,999 people	Four (4) dual sample sets <b>per quarter</b> . Two (2) dual sample sets taken at the high TTHM location and 2 dual sample sets taken at the high HAA5 location.	Monitoring can be reduced to 2 dual sample sets <b>per year</b> . One (1) dual sample set at the location and during the quarter with the highest single TTHM measurement and 1 dual sample set at the location and during the quarter with the highest single HAA5 measurement.  To remain on reduced monitoring: <ol style="list-style-type: none"> <li>1) TTHM and HAA5 sample results must be <math>\leq 60</math> ug/L and <math>\leq 45</math> ug/L respectively.</li> </ol>
Ground water serving 500-9,999 people	Two (2) dual sample sets <b>per year</b> . One (1) dual sample set taken at the high TTHM location and 1 dual sample set taken at the high HAA5 location.	Monitoring can be reduced to 1 TTHM sample <b>per year</b> at the location and during the quarter with the highest single TTHM measurement and 1 HAA5 sample <b>per year</b> at the location and during the quarter with the highest single HAA5 measurement. One (1) dual sample set <b>per year</b> if the highest TTHM and HAA5 measurements occurred at the same location and quarter.  To remain on reduced monitoring: <ol style="list-style-type: none"> <li>1) TTHM and HAA5 sample results must be <math>\leq 60</math> ug/L and <math>\leq 45</math> ug/L respectively.</li> </ol>
Ground water serving < 500 people	Two (2) dual sample sets <b>per year</b> . One (1) dual sample set taken at the high TTHM location and 1 dual sample set taken at the high HAA5 location.	Monitoring can be reduced to 1 TTHM sample <b>every third year</b> at the location and during the quarter with the highest single TTHM measurement and 1 HAA5 sample <b>every third year</b> at the location and during the quarter with the highest single HAA5 measurement. One (1) dual sample set <b>every third year</b> if the highest TTHM and HAA5 measurements occurred at the same location and quarter.  To remain on reduced monitoring: <ol style="list-style-type: none"> <li>1) TTHM and HAA5 sample results must be <math>\leq 60</math> ug/L and <math>\leq 45</math> ug/L respectively.</li> </ol>

**Stage 1 and 2 DBP  
Total Organic Carbon (TOC), Chlorite, Bromate, and Disinfectant Residual Monitoring**

<b>Analyte</b>	<b>Routine Monitoring</b>	<b>Reduced Monitoring</b>
TOC & Alkalinity	<p><b><u>Plants using conventional filtration:</u></b> One (1) source water and one (1) finished water TOC sample (i.e. paired samples) per plant per month &amp; one (1) source water alkalinity sample collected at the same time that the source water TOC sample is collected.</p>	<p>Monitoring may be reduced to one (1) paired TOC sample set and one (1) source water alkalinity sample per plant per quarter if:</p> <ol style="list-style-type: none"> <li>1) Average treated water TOC &lt; 2.0 mg/L for 2 years, or</li> <li>2) Average treated water TOC &lt; 1.0 mg/L for one year.</li> </ol>
Bromate	<p><b><u>Plants using ozone for disinfection or oxidation:</u></b> One (1) sample per plant per month taken at the entry point to the distribution system while the ozonation system is operating under normal conditions.</p>	<p>Monitoring may be reduced to one (1) Bromate sample per plant per quarter if:</p> <ol style="list-style-type: none"> <li>1) Treated water bromate RAA is <math>\leq 0.0025</math> mg/L, based on monthly samples analyzed using EPA Method 317.0 Rev 2.0, 326.0, or 321.8.</li> </ol>
Chlorite	<p><b><u>All public water systems using ClO<sub>2</sub> for disinfection or oxidation:</u></b></p> <p><i>Daily Monitoring</i> -- One (1) sample per day collected at the entry point to the distribution system.</p> <p><i>Triggered Monitoring</i> -- If daily entry point chlorite &gt; 1.0 ppm, the system should notify Department and must collect one 3-sample set in the distribution system on the following day.</p> <p><i>Monthly Monitoring</i> -- One 3-sample set per month in the distribution system.</p>	<p><i>Daily monitoring</i> -- Daily monitoring may not be reduced.</p> <p><i>Triggered Distribution System Monitoring</i> -- Triggered distribution system monitoring may not be reduced.</p> <p><i>Monthly monitoring</i> -- Monitoring may be reduced to quarterly, if the chlorite concentration in all samples taken in the distribution system is below 1.0 mg/L for a period of one year.</p>
Chlorine & Chloramines	<p>Samples taken at the same time and location as total coliform samples.</p>	<p>Monitoring may not be reduced.</p>
Chlorine dioxide	<p><b><u>All public water systems using ClO<sub>2</sub> for disinfection or oxidation:</u></b></p> <p><i>Daily Monitoring</i> -- One (1) sample per day collected at the entry point to the distribution system.</p> <p><i>Triggered Monitoring</i> -- If daily entry point ClO<sub>2</sub> &gt; 0.8 mg/L, the system must collect 3 distribution system samples on the following day.</p>	<p>Monitoring may not be reduced.</p>

### 5.2.11 ANALYTICAL TECHNIQUES

The water system must conduct sample collection and analysis for disinfectant residuals and, where applicable, entry point chlorite and source water alkalinity samples.

**A. Chlorine and Chloramine must be handled and analyzed by one of the following analytical methods:**

Standard Method 4500-Cl D (APHA, 1995) -- Amperometric Titration Method.  
ASTM Method D 1253-86 (96), 03 (ASTM 2003) – Amperometric Titration Method  
Standard Method 4500-Cl E (APHA, 1995) -- Low Level Amperometric Titration Method.  
Standard Method 4500-Cl F (APHA, 1995) -- DPD Ferrous Titrimetric Method.  
Standard Method 4500-Cl G (APHA, 1995) -- DPD Colorimetric Method.  
Standard Method 4500-Cl H (APHA, 1995) -- Syringaldazine (FACTS). **(Chlorine Only)**  
Standard Method 4500-Cl I (APHA, 1995) -- Iodometric Electrode.

**B. Chlorine dioxide must be handled and analyzed by one of the following analytical methods:**

Standard Method 4500-ClO<sub>2</sub> D (APHA, 1995) – DPD Method.  
Standard Method 4500-ClO<sub>2</sub> E (APHA, 1995) – Amperometric Titration Method.  
EPA Method 327.0 Rev 1.1 (EPA, 2005)

**C. Chlorite must be handled and analyzed by one of the following analytical methods:**

Daily monitoring – Standard Method 4500-ClO<sub>2</sub> E.  
Daily monitoring – EPA Method 327.0 Rev 1.1 (EPA, 2005)

**D. Alkalinity must be handled and analyzed by one of the following methods:**

Standard Method 2320 B (APHA, 1995).  
Method I-1030-85 (USGS, 1989).

**E. pH must be handled and analyzed by one of the following methods:**

EPA Method 150.1.  
EPA Method 150.2.  
Standard Method 4500 H+ B

### 5.2.12 COMPLETION AND SUBMITTAL OF REPORT FORMS

The operator of a water system which adds a chemical disinfectant as a part of the treatment process must complete and submit monthly Operation and Chemical Report Forms in order to document compliance with the Stage I Disinfection By-Product Rule. The Department supplies water systems with the forms to report the required information. This section will discuss those sections which must be completed in order to document compliance with the requirements of the Stage 1 DBPR. **(Note: Systems must report all required information to the State within 10 days after the end of each month that system serves water to the public.)**

#### 5.2.12.1 Distribution System Disinfectant Residual Monitoring

**A. Chlorine and Chloramine Residual Monitoring**

The Stage 1 DBPR requires the water system to record and report the chlorine and/or chloramines residuals in the distribution system at the same time and location that bacteriological samples are collected. These residuals must be recorded on the Bacteriological Monitoring Report (BMR) and this report must be submitted to the Department each month. The headings for that form appear below. See Section 4 on the proper manner to complete this form.

<b>PUBLIC WATER SYSTEM - BACTERIOLOGICAL MONITORING RECORD</b>						
Arkansas Department of Health / Division of Engineering						
PUBLIC WATER SYSTEM NAME _____				PWS ID # _____		
MONTH _____	YEAR _____	COUNTY _____				
DATE	SAMPLE SITE #	TYPE - REGULAR OR RESAMPLE	CHLORINE RESIDUAL MG/L	LAB RESULTS	DAY/DATE RESULTS RECEIVED	RESAMPLE CONTAINERS  (Day/Date Received)

**B. Chlorine Dioxide Residual Monitoring**

All water systems using chlorine dioxide for disinfection or oxidation must record and report the chlorine dioxide residuals at the entry point to the distribution system daily and, if triggered, in the distribution system. These residuals must be recorded on the backside of the Operations and Chemical Report Form and this report must be submitted to the Department each month. The headings for that form appear below.

ClO2 Residual Monitoring (ppm)				
Date	Entry Point	Distribution System		
		Pt. 1	Pt. 2	Pt. 3
1				
2				

**5.2.12.2 Chlorite Monitoring**

All CWS and NTNCWS using chlorine dioxide for disinfection or oxidation must record and report the chlorite levels at the entry point to the distribution system daily. If the daily entry point chlorite level is greater than 1.0 mg/L, the system must notify the Department immediately and collect distribution system chlorite samples on the following day. The chlorite levels and whether or not distribution systems samples were collected must be recorded on the front side of the Operations and Chemical Report Form and this report must be submitted to the Department each month. The headings for that section appear below.

Chlorite Monitoring (For Systems Using Chlorine Dioxide)		D
Entry Point Chlorite (ppm)	Dist. Samples Collected (Y / N)	A
		T
		E
		1
		2

### 5.2.12.3 Alkalinity Monitoring

CWS and NTNCWS using surface source(s) and/or GWUDI source(s) that use conventional filtration treatment must monitor the raw water alkalinity on the same day that TOC samples are collected. **Since the Department collects TOC samples on a random basis, it is requested that the system measure the raw water alkalinity the first thing in the morning on a daily basis.** The raw water alkalinity level must be recorded on the front side of the Operations and Chemical Report Form and this report must be submitted to the Department each month. The headings for that section appear below.

Alkalinity (ppm)		
Raw	Set	Fin

### 5.2.13 OPERATIONAL EVALUATION AND REPORT

CWS and NTNCWS which exceed the operational evaluation level (OEL) at any monitoring location must conduct an operational evaluation and submit a written report of the evaluation to the Department. **(Note: Systems must report all required information to the Department within 90 days after being notified of the analytical result that causes the system to exceed the OEL.)** The written report must be maintained on file for review by the Department during sanitary surveys and by the general public as requested. The evaluation must include an examination of:

- A. Treatment operational practices
  - 1. Treatment changes
  - 2. Treatment problems
- B. Distribution operational practices
  - 1. Storage tank operations
  - 2. Excess storage capacity
  - 3. Distribution system flushing
- C. Source changes
  - 1. Change of source(s)
  - 2. Source water quality change
- D. Steps to be considered to minimize future exceedances.

Systems may request to limit the scope of the evaluation if the cause of the OEL exceedance can be identified. The request to limit the scope does not extend the schedule for submitting the written report. Approval to limit the scope must be in writing and kept with the completed report.

## 5.3 GROUND WATER RULE

### 5.3.1 AUTHORITY

The Ground Water Rule was published in the Code of Federal Register on November 8, 2006, adopted under the authority of 40 CFR Parts 9, 141 and 142. EPA promulgated the GWR. Compliance with the rule began on December 1, 2009.

The following Rules and Regulations Pertaining to Public Water Systems are duly adopted and promulgated by the Arkansas State Board of Health pursuant to the authority expressly conferred by the Laws of the State of Arkansas including, without limitation, Act 96 of 1913, as amended (Ark. Codes Ann. § 20-7-109).

### 5.3.2 INTRODUCTION

The purpose of the GWR is to provide increased protection against microbial pathogens in public water systems that use ground water sources – more specifically viruses. All PWSs using ground water as a source of drinking water are affected by the GWR. This includes community water systems, non-transient non-community water systems, transient non-community water systems, and all consecutive systems.

The exception to this is for PWSs that mix their ground water source(s) with surface water, or ground water under the direct influence, before treatment need not treat further.

Basic requirements of the GWR include:

- 1) Triggered Monitoring
- 2) Compliance Monitoring
- 3) Sanitary Surveys
- 4) Corrective Actions

### 5.3.3 ACRONYMS

CFR – Code of Federal Regulations

CT – The residual concentration of disinfectant (mg/l) multiplied by contact time (minutes)

EPA – United States Environmental Protection Agency

GWUDI – Ground Water Under the Direct Influence of Surface Water

GWR – Ground Water Rule

GWS – Ground Water System

Mg/l – milligrams per liter

PWS – Public Water System

TCR – Total Coliform Rule

### 5.3.4 DEFINITIONS

**“CT”** – the product of the residual disinfectant concentration (C) in mg/l and the disinfectant contact time (T) in minutes. The residual disinfectant is measured at the effluent from the basin or pipeline; the contact time is the time at which no more than 10% of the water would have exited a basin or pipeline.

**“Disinfection”** – a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

**“Disinfection Profile”** – a summary of daily *Giardia lamblia* and virus inactivation through the treatment plant.

**“Ground Water System”** - The water that systems pump and treat from aquifers (natural reservoirs below the earth's surface).

**“Triggered Monitoring”** - GWSs that decide not to provide 4-log treatment of ground water sources are required to conduct Triggered Monitoring of raw water. If a system is notified of a positive coliform sample result in the distribution system for a routine sample collected under the RTRC, then the system must collect a sample(s) from each raw water source within 24 hours of notification of results. The samples must be taken from all sources that were in operation on the same day as the positive sample.

If any triggered raw water sample(s) is *E. coli* positive, the system must:

- 1) Provide Tier 1 Public Notice within 24 hours

And either

- 2) Take the necessary corrective actions

Or

- 3) Within 24 hours of notification that any source water sample(s) tested *E. coli* positive, the GWS must collect 5 additional raw water samples from each source that tested positive for *E. coli*. If any one out of this group of samples is found to be *E. coli* positive, the GWS must consult with the State within 30 days

And

- 4) Take the necessary corrective actions within 120 days
  - a) Complete corrective actions, or
  - b) Be in compliance with a State approved action plan and schedule

### 5.3.5 COMPLIANCE MONITORING

A GWS that provides 4-log virus removal/inactivation to all its water sources is to conduct compliance monitoring following treatment. Water quality analyses, specific to the treatment processes, must be conducted to demonstrate that this level of treatment is being constantly achieved. The sampling location(s) must be ADH approved. This monitoring is in addition to the routine TCR samples. GWR Compliance Monitoring requirements depend on the system’s size and the type of treatment being used.

At a minimum, Compliance Monitoring under the GWR will consist of disinfectant residual monitoring to ensure that adequate CT is provided from source to first customer. CT will be determined using the following tables:

#### CT Values for Inactivation of Viruses by Free Chlorine, pH 6.0-9.0

Deg C	1	2	3	4	5	6	7	8	9	10
CT	11.6	10.7	9.8	8.9	8	7.6	7.2	6.8	6.4	6
Deg C	11	12	13	14	15	16	17	18	19	20
CT	5.6	5.2	4.8	4.4	4	3.8	3.6	3.4	3.2	3

#### Free Chlorine - pH 10

Deg C	0.5	5	10	15	20	25
CT	90	60	45	30	22	15

#### Chloramines, pH 6-9

Deg C	<1	5	10	15	20	25
CT	2883	1988	1491	994	746	497

### Chlorine Dioxide, pH 6-9

Deg C	<1	5	10	15	20	25
CT	50.1	33.4	25	17	13	8.4

### Ozone - pH 6-9

Deg C	<1	5	10	15	20	25
CT	1.8	1.2	1	0.6	0.5	0.3

GWSs that serve greater than 3,300 in population must continuously monitor free chlorine residual and record the lowest residual disinfectant concentration on each day. Monitoring continuously means that measurements must be taken at least every 15 minutes and the lowest residual disinfectant concentration for each day must be reported.

GWSs that serve a population of 3,300 or less may monitor free residual chlorine once daily by a grab sample during the peak flow rate. These systems may also elect to monitor chlorine residual continuously under the same conditions as greater population systems.

All GWSs that disinfect using an alternate to chlorine (i.e.; chlorine dioxide, chloramines, ozone, etc.) and those that provide treatment in addition to disinfection are to contact the ADH for assistance in determining treatment credit towards 4-log removal/inactivation.

If a GWS can demonstrate that the system was consistently meeting all treatment parameters at the time of a TCR positive distribution sample, then a problem in the distribution system would be indicated and only actions under the TCR would be appropriate.

#### 5.3.6 CONSECUTIVE SYSTEMS

A consecutive GWS that purchases 100% of its drinking water from another system will continue to monitor the distribution system under the RTCR rule. If a routine RTCR sample is found to be positive for total coliform, then the GWS must notify the wholesale GWS within 24 hours of learning of the result. ADH plans to notify parent systems of consecutive positives; but the responsibility lies with the consecutive system. The wholesale system must then take appropriate action (triggered or compliance monitoring) within 24 hours of notification. The consecutive system will continue with the resample requirements of the RTCR. (Note: It is imperative that the consecutive system monitor the chlorine residual at the time of RTCR sample collection and record on the sample report.)

Monitoring plans must be developed for all GWSs; however the monitoring plan for consecutive systems will likely be either:

- 1) Collect routine bacti samples at RTCR sites; monitor and record chlorine residual on the sample form;

Or

- 2) Under the primacy plan, if CT is met at the master meter, any positive result will be considered a distribution system related problem; and if CT is not met at the master meter, a positive result will require notification of parent system and subsequent triggered monitoring of the parent system's sources in operation at time of sample collection.

Consecutive GWSs that purchase a portion of their water and retain their own well(s) feeding directly into the distribution system will need to notify its wholesale system(s) upon occurrence of a positive routine TCR sample, plus be responsible for Triggered Monitoring of its own raw water source(s).

### **5.3.7 SANITARY SURVEYS**

The ADH will continue to conduct sanitary surveys at each Community and Non-Transient Non Community GWS on a 3 year cycle and at each Transient Non-Community on a 5 year cycle. Each survey must include, but is not limited to, an onsite review and evaluation of eight elements as follows:

- 1) Source
- 2) Treatment
- 3) Distribution System
- 4) Finished water storage
- 5) Pumps, pump facilities, and controls
- 6) Monitoring, reporting, and data verification
- 7) System management and operation
- 8) Operator compliance with state requirements

### **5.3.8 CORRECTIVE ACTIONS**

If the ADH identifies a significant deficiency during a survey, or at any other time, corrective actions must be taken. Corrective action alternatives include one or more of the following:

- 1) Correct all significant deficiencies
- 2) Provide an alternate source of water
- 3) Eliminate the source of contamination
- 4) Provide treatment that reliably achieves 4-log inactivation and/or removal of viruses

Corrective actions are to be discussed with and receive approval of ADH before undertaking any action.

### **5.3.9 REPORTING REQUIREMENTS**

- 1) A GWS conducting compliance monitoring must notify the State no later than the next working day any time the system fails to meet State specified operating criteria for a period greater than 4 hours, including:
  - a. Residual disinfectant concentration
  - b. Membrane operating criteria and integrity tests
  - c. Alternate treatment operating criteria
- 2) A GWS must notify the State within 30 days after completing corrective action for significant deficiencies or source water fecal indicator contamination.
- 3) If a GWS, subject to source water monitoring, determines that a coliform positive sample is related to distribution system conditions, it must provide documentation to the State that it met State criteria within 30 days of the total coliform positive sample.

### **5.3.10 RECORDKEEPING REQUIREMENTS**

A GWS must maintain the following information in its records:

- 1) Documentation of corrective actions indicator. (10 years)
- 2) Documentation of notice to the public of:
  - a. An uncorrected significant deficiency, or
  - b. A fecal indicator positive ground water source sample that is not invalidated
- 3) Records of decisions where either: (5 years)
  - a. State determinations and written documentation that a total coliform positive sample under routine RTRC monitoring is directly related to the distribution system, or

- b. The GWS determines, according to State criteria, that a total coliform positive sample under routine RTCR monitoring is directly related to the distribution system.
- 4) Documentation of notification to the wholesale system(s) by a consecutive system of total coliform positive samples which are not invalidated. (5 years)
- 5) For systems required to perform compliance monitoring: (5 years)
  - a. Records of the lowest daily residual disinfectant value and records of the date and duration of any failure to maintain the State prescribed minimum disinfectant residual for a period of more than four hours.
  - b. Records of State specified compliance requirements for membrane filtration and of parameters specified by the State for State approved alternative treatment and records of the date and duration of any failure to the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours.

#### **5.3.11 TREATMENT TECHNIQUE VIOLATIONS**

- 1) GWS does not complete corrective action plan as determined by the State, or any interim actions.
- 2) GWS is not in compliance with a State approved corrective action plan and schedule.
- 3) E. Coli positive GW source sample is not invalidated and GWS is not in compliance with a State approved Corrective Action plan
- 4) GWS subject to compliance monitoring fails to maintain 4-log virus removal/inactivation for more than 4 hours at or before first customer
- 5) GWS does not issue a public notice for the above treatment technique violations.

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## 6 BOIL WATER ORDER POLICY

### 6.1 INTRODUCTION

A boil water notice is intended to prevent the spread of communicable diseases caused by waterborne pathogens. Such a notice has serious implications for a community and should not be issued for trivial reasons. The decision to issue a notice must frequently be made within a relatively short period of time and be based on either incomplete or inconclusive information. Therefore, knowledge of the circumstances involved, the water system's infrastructure, and communicable disease prevention are essential in evaluating the situation and taking the proper steps to protect public health without unduly alarming the public.

This policy is intended to provide guidance to Arkansas Department of Health staff and water utility officials on issuing a notice, the manner and method of notification, corrective steps to take, and repealing a notice.

Although microbial contamination is the most common type of contamination problem, it is not the only one. Occasionally, public water systems experience contamination of the water supply as the result of chemical spills or cross connections. In such a case, the specific action to be taken will be determined on a case-by-case basis, but would normally involve a "Do Not Use" notice to the customers. The method of notifying customers would be similar to a boil water notice. Contact the Engineering Section immediately for more information or if such an incident should occur.

Past public health practices have suggested the use of household bleach as a means of disinfecting small quantities of water for drinking or cooking. However, since some pathogenic cysts are unaffected by chlorine, unless the source of contamination is known to not include such cysts, the presumption should be made these cysts are present and that only boiling the water will be effective in making it safe for consumption.

Local health and water utility officials are encouraged to seek advice from the Department if in doubt about a potential contamination incident of the water supply by contacting the Engineering Section its primary telephone numbers (501) 661-2623 and (800) 462-0599. For after business hours emergencies, contact the Department's Emergency Communications Center (ECC) at (800) 554-5738. The on-call Engineering Section staff member will be contacted by the ECC.

### 6.2 CAUSES OF BOIL WATER NOTICES

Boil water notices are issued for two principal reasons with the difference between the two based on what evidence is available that the water is contaminated.

### 6.3 PRECAUTIONARY BOIL WATER NOTICES

Issued by the Department or the water utility when a presumption is made that the water may be contaminated and the notice is for precautionary reasons.

Instances where such a notice can be warranted include:

- 6.3.1 Zero distribution pressure due to main breaks, power failures, equipment failure, etc. for a sustained period of time or over a wide area. The criteria to avoid a boil water advisory for a pressure loss are outlined later in this policy.
- 6.3.2 Persistent failure or significant interruption of key water treatment processes: loss of one or more treatment barriers or turbidity spike in the effluent quality.
- 6.3.3 Persistent failure to meet Surface Water Treatment Rule treatment techniques: high turbidity, failure to meet CT or effluent disinfection requirements.
- 6.3.4 An unusual and significant microbiological challenge to a drinking water source from a spill, discharge, natural occurrence, or other circumstance.

In considering whether to issue a boil water notice for circumstances 2-3, the following are to be taken into account.

- 6.3.5 Vulnerability of the source to contamination: whether the source water supply or its watershed has significant upstream sewage or storm sewer discharges and the degree of treatment of those discharges, confined animal operations (chicken, turkey, hog), livestock operations (cattle and dairy farms), heavy recreational use, or any other activity which could contribute significant pathogens to the source water.
- 6.3.6 Treatment effectiveness and operational history: the unit processes employed in treating the water and whether they are properly operating, the water quality record of the plant, the skill level of those operating the plant, and knowledge of past similar occurrences.

#### **6.4 CONTAMINATED BOIL WATER NOTICES**

A Boil Water Notice is issued by the Department or the water utility when the presumption is made that the water is contaminated based on supporting operational, water quality, or epidemiological evidence.

Instances where this type of notice is warranted include:

- 6.4.1 Acute maximum contaminant violations of the Total Coliform Rule or confirmed presence of E. coli in compliance or special samples.
- 6.4.2 Persistent presence of total coliform in compliance or special samples.
- 6.4.3 A cross-connection incident involving a microbiological contaminant.
- 6.4.4 Evidence of a disease outbreak where available data suggests drinking water may be the source.
- 6.4.5 Natural disasters (floods, tornado, earthquake) likely to have adversely affected water quality in the treatment plant or distribution system other than a loss of pressure.
- 6.4.6 Positive tests for pathogens when consideration is given to the source and timeliness of the analyses, appropriateness of the collection and test methods utilized, and the limitation of the test method and results.

#### **6.5 NOTICE CONCURRENCE BY THE DEPARTMENT**

With the exception of 6.3.1 - loss of pressure, the decision to issue a boil water notice is to be made with the concurrence of the Engineer Supervisor who oversees the respective water system or a member of the Engineering Section management - Director, Asst. Director, or Chief Engineer.

#### **6.6 FORMAT**

- 6.6.1 Water utilities can issue boil water notices on their own authority. The issuance of a boil water notice by a water utility carries with it the implicit approval by the Department. Standard notice forms of the Department are available. The Arkansas Rules and Regulations Pertaining to Public Water Systems (Section XVII) require that the Department be notified within four hours of any emergency condition and the issuance of a boil water notice by a water system qualifies as an emergency condition.
- 6.6.2 If the utility provides its own notice, a copy is to be faxed to the Engineering Section or the Department's Communications Center notified by phone. The Department will, by letter to the utility, confirm the boil water notice and, if necessary, provide notice to the state news service through a press release. If each affected customer is individually notified of the boil water notice by the water utility, a press release to the media is not necessary; however, notification of the Department is still required.
- 6.6.3 All notices should contain, at a minimum, the following information.
  - 6.6.3.1 Title of the notice.
  - 6.6.3.2 Who is issuing the notice?
  - 6.6.3.3 What areas of the water system are affected?

- 6.6.3.4 The reason for the notice and whether the water may be contaminated (precautionary notice) or is presumed to be contaminated (contaminated water notice).
- 6.6.3.5 The corrective action required by the customer.
- 6.6.3.6 Name and phone number of a person to contact for questions.

## **6.7 DISTRIBUTION**

- 6.7.1 In the event of an emergency, the water system must make reasonable efforts to notify the effected customers and the general public. Prompt notification to customers of a boil water notice is critical if the notice is to be effective. A written or verbal notice to the individual customer is the most effective means of notification. Door hangers, phone calls, and posted notices in frequented places such as post offices, convenience stores, etc. work well. Notices should not be placed in a mailbox since the occupant may not see it for a day or more. Particular attention to notifying hospitals, nursing homes, restaurants, hotels, schools, daycares, industries and other similar facilities must be taken immediately.
- 6.7.2 If the area impacted is large, a notice should be provided to the electronic and print media - radio, TV, and newspapers. Media notification is not required if all affected customers have been directly contacted. If the event demonstrates evidence of a disease outbreak, any notice should be coordinated with the Department.

## **6.8 CORRECTIVE ACTION**

- 6.8.1 For the customer's part, the principal action will be to boil the water. Water used for drinking and cooking should be heated to a rolling boil for at least one minute. Ice cubes formed in the time period for which the boil notice is in effect should be discarded and only boiled water used for making ice. Water used for bathing should not be a problem; however, small children should be supervised to ensure that they do not ingest the water. In addition to or in lieu of boiling the water, the customer may want to utilize bottled water from a reputable source.
- 6.8.2 For water systems, common corrective measures for boil notices due to distribution problems include establishing and maintaining higher chlorine residuals, flushing of lines and varying tank levels to eliminate stagnant water, and conducting a cross-connection survey. For boil water notices due to a treatment failure, corrective measures include optimizing all treatment processes, establishing and maintaining higher chlorine levels, collection of bacteriological samples during and following the treatment failure, and the use of alternate approved sources of water. Employing these measures, may be a mitigating factor in the decision by the Department to issue a boil notice.
- 6.8.3 The required corrective measures will be dependent on the particular reason for the boil water notice and must be determined on a case-by-case basis.

## **6.9 REPEAL OF BOIL WATER NOTICE**

In order to repeal a boil water notice, the principal incident or reason for the issuance of the notice must have been corrected. This could require onsite verification by Department personnel. Additionally, bacteriological samples taken on two consecutive days from the affected area must be coliform absent, except for notices issued for a pressure loss. In those cases, a single set of bacteriological samples from the affected area must be coliform absent. The number of samples required in each set of samples is determined by the number of services/population served. The number of samples, per day, must be sufficient to be representative of the affected area with the minimum number as outlined in Table 6.1.

Table 6.1 Boil Water Bacteriological Sampling by Population

# Services Affected	Population Affected	Minimum # of Samples
1 - 50	≤ 125	1
51 - 100	126-250	2
101 - 500	251-1250	3
501 - 1000	1251-2500	4
1001 - 2000	2501-5000	5
> 2000	>5000	# Required by Total Coliform Rule

If the boil notice is due to a main break or repair, a cross connection, or a treatment failure, at least one of the samples must be taken in the immediate vicinity of the repair, cross-connection, or from the treatment plant effluent. If a boil water notice has not been issued and a bacteriological sample is *E.coli* positive, the Department is to be notified immediately or a boil water notice issued. If total coliform positive, collect resamples and obtain two consecutive sets of daily samples which are coliform absent.

The information contained in the repeal notice is to be similar to that of the original notice:

1. Title of the Repeal.
2. Who is issuing the Repeal.
3. What areas of the water system were affected?
4. Explanation that action (boiling) is no longer required by the customer.
5. Why the notice is being lifted: the correction of the deficiency originating the notice and the results of bacteriological samples.
6. Name and phone number of a person to contact for questions.

The manner of distribution is to be the same as the original boil notice.

**6.10 CRITERIA FOR AVOIDING A BWN DUE TO A LOSS OF DISTRIBUTION PRESSURE**

In order to avoid issuing a BWN due to a loss of distribution pressure, the following criteria must be met. See flow chart for summary.

1. The area must be limited: the water utility knows exactly the areas affected, the area is manageable from both a size and number of customers' standpoint, not more than 150 connections, and representative samples can be collected from the affected area immediately after the resumption of service.
2. The time for zero pressure is limited: see column A next page; if the water system has a cross-connection control program and its unaccounted for water (Which is the difference between the water put into the distribution system versus the water metered to the customers.) is 15% or less, see column B next page. The same area is not subject to outages multiple times on the same day or on consecutive days.

# Services Affected <sup>1</sup>	Length of Outage	
	A. No CCCP or UAW>15% or Unknown	B. CCCP & UAW ≤15%
1 - 25	4 Hrs	8 Hrs
26 - 75	3 Hrs	6 Hrs
76 - 150	2 Hrs	4 Hrs

UAW = System unaccounted for water for the most recent calendar or fiscal year.  
 CCCP = Cross Connection Control Program

<sup>1</sup> If the pipeline has no individual services in the affected area but has services downstream, the length of outage is not to exceed the respective values for 1-25 services regardless of the number of services downstream provided that pressure for the downstream services is maintained by another supply or storage. Bacteriological sample(s) are required upon the resumption of service if the number of downstream services exceed 150 even if the criteria in (7) above are met.

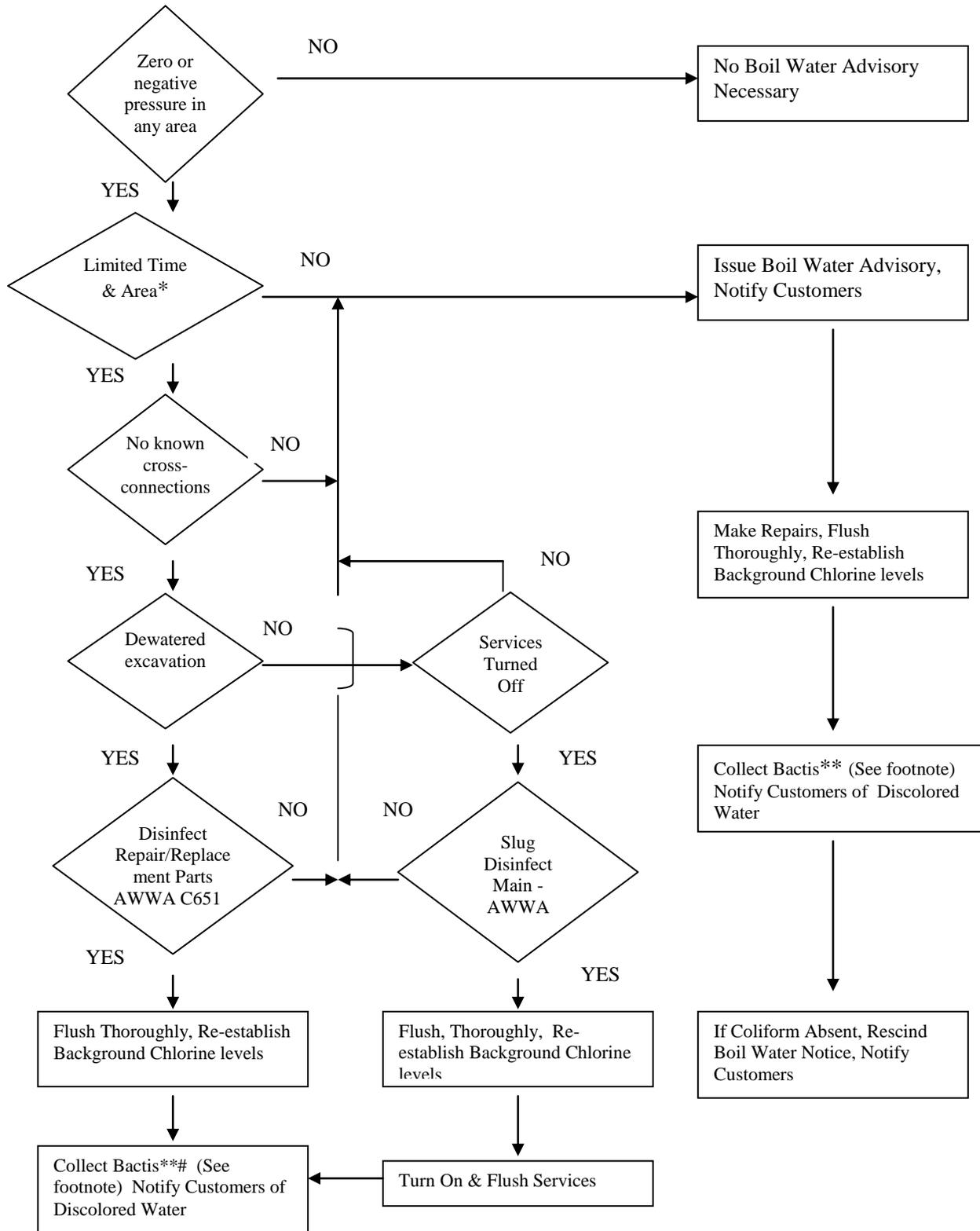
3. There was no known backflow or back-siphonage in the affected area.
4. Any excavation for repair is dewatered prior to pressure in the main being taken to zero. If this is not possible, all affected services must be shut off.
5. All repair parts are disinfected per AWWA C651 <sup>2</sup>, or, if services are shut off, the main is disinfected utilizing slug disinfection.
6. Any area of repair is flushed thoroughly and background chlorine levels are re-established.
7. Bacteriological samples are collected from the affected area. If sample results are coliform positive, notify the Department. In order for samples not to be taken, all of the following criteria must be met in addition to items 1 through 6:
  - A. The PWS must have had no bacteriological monitoring or maximum contaminant level violations in the past year.
  - B. The repair/maintenance must be supervised by a licensed operator.
  - C. The crew must utilize written operating procedures in conformance with AWWA C651, and a copy must be carried by the crew. The procedures are subject to review by the Department upon request.
  - D. A background chlorine residual of at least 0.2 mg/l must be established within 30 minutes in the affected area after the resumption of service.
  - E. The length of the outage cannot exceed the time indicated in column A for the respective number of customers.

For scheduled maintenance, prior notification of affected customers should be made. For emergency repairs, notice of customers by the most practical method should be attempted. In either case, the notice should state that water service is to be (or has been) interrupted, that discolored water may occur, and that flushing of faucets should improve any discoloration. The notice should include a contact phone number.

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2 **Summary: trench is dewatered and hypochlorite is liberally applied to the area; all repair pipe and fittings are swabbed or sprayed with a 1 percent hypochlorite solution before installation; thorough flushing toward the work area, from both directions if possible, is started as soon as repairs are completed and continued until the discolored water is eliminated. See AWWA C651 for complete description.**

**FLOW CHART - BOIL WATER NOTICE FOR PRESSURE OUTAGES**



**Footnote**

Dependent upon the number of services, length of outage, Cross Connection Control Program implementation, and unaccounted for water. See below and policy for details.

<b><u># Services</u></b>	<b><u>No CCCP, or Unaccounted Water &gt;15% or Unknown</u></b>	<b><u>CCCP &amp; Unaccounted Water &lt;= 15%</u></b>
1-25	4 Hr	8 Hr
26-75	3 Hr	6 Hr
76-150	2 Hr	4 Hr

If the pipeline has no individual services in the affected area but has services downstream, the length of outage for the pipeline is not to exceed the respective values for 1-25 services regardless of the number of services downstream provided that pressure for the downstream services is maintained by another supply or storage. Bacteriological sample(s) are required upon the resumption of service if the number of downstream services exceed 150. See policy for details.

**Footnote \*\***

<b><u># Services Affected</u></b>	<b><u>Population Affected</u></b>	<b><u>Minimum # of Samples</u></b>
1 - 50	< 125	1
51 - 100	126 - 250	2
101 - 500	251 - 1250	3
501 - 1000	1251 - 2500	4
1001 - 2000	2501 - 5000	5
> 2000	> 5000	# Required by Total Coliform Rule

**Footnote #**

Immediately notify the Department if E.coli positive or issue a boil water notice. If total coliform positive, resample to obtain two consecutive sets of daily sample which are coliform absent.

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## **7 CONSUMER CONFIDENCE REPORT**

The Consumer Confidence Rule specifies that each community public water system must prepare, and make available to all customers, an annual report describing the source of the water and the water quality, including information on any contaminant detections or violations. The Consumer Confidence Report must be prepared and provided to the public by July 1 of each year. This section describes detailed requirements for preparing and delivering the Consumer Confidence Report.

### **7.1 AUTHORITY**

The Consumer Confidence Report Rule (CCR) is part of the 1996 Amendments of the Safe Drinking Water Act, which gives consumers information on their drinking water. Under the National Primary Drinking Water Regulations (Section 40 CFR Parts 141 Subpart O Vol. 63), community water systems (CWSs) will be required to prepare and distribute a consumer confidence report to customers. Non-Community Non Transient or Non-Community Transient public water systems are not required to prepare a consumer confidence report.

### **.2 RULE REQUIREMENTS**

#### **.2.1 IMPLEMENTATION**

Existing CWS's must provide:

1. Delivery of CCR to customers and Arkansas Department of Health and Human Services by July 1 of each year;
2. Delivery of certification - of delivery to the state by October 1, of that year

New CWS's must provide:

1. Delivery of first CCR - by July 1 after first full calendar operating year
2. Delivery of first certification to the state - by October 1 after first full calendar operating year
3. Delivery of subsequent CCRs - by July 1, annually
4. Delivery of subsequent certifications-by October 1, annually

CWSs That Sell Water To Another CWS must provide:

1. Delivery of information for CCR - By April 1, annually

#### **.2.2 CONTENT OF A CCR**

Each Consumer Confidence Report must contain the following information.

#### **.2.3 REQUIRED WATER SYSTEM INFORMATION**

- Telephone number and name of a contact person.
- Information for non-English speaking populations, if appropriate.
- Information on public participation opportunities.

#### **.2.4 INFORMATION ON SOURCE(S) OF WATER**

- Type, common name, location of water source(s), and a description if from multiple hydraulically independent distribution systems fed from direct water sources.
- Source water assessment information if available.
  - Notice of availability of completed assessment.
  - Information on how customers can obtain a summary of the assessment.
  - A brief summary of the system's susceptibility to potential sources of contamination.

#### **.2.5 EPA DEFINITIONS**

- Maximum Contaminant Level, Maximum Contaminant Level Goal, Maximum Residual Disinfectant Level, Maximum Residual Disinfectant Level Goal, Parts per million or Milligrams per liter, and Action Level. (Required)

- Non-Detect, Parts per billion, Parts per trillion, Parts per quadrillion, Picocuries per liter, Millirems per year, Million Fibers per year, Million Fibers per liter, Millirems per year, Million Fibers per liter, Nephelometric Turbidity Unit, Variances, Exemption, Treatment Technique, and Contact Time. ( Only if Applicable)
- Any abbreviations or acronym used must be defined.

**.2.6 REPORT LEVELS OF REGULATED AND UNREGULATED CONTAMINANTS (DETECTED ONLY)**

- Report highest contaminant level used to determine compliance
- Indicate Maximum Contaminant Level and Maximum Contaminant Level Goal
- Indicate range and average of levels found
- EPA description of likely source(s)
- EPA unregulated contaminant definition (If applicable)

**.2.7 INFORMATION ON CRYPTOSPORIDIUM, RADON, AND OTHER CONTAMINANTS**

- If monitoring indicates Cryptosporidium may be present in the source water of finished water, include a summary of the monitoring results and an explanation of the significance of the results.
- If monitoring indicates radon may be present in finished water, include the results of monitoring and an explanation of the significance of the results.
- If additional monitoring indicates the presence of other contaminants in the finished water, EPA strongly encourages systems to report any results, which may indicate a health concern.

**.2.8 ASSESSMENTS AND SIGNIFICANT DEFICIENCIES**

- Description of any significant deficiencies that have not been corrected.
- Identify the number and type of RTCR system Assessments completed, number of required corrective actions and when the corrective actions were completed.

**.2.1 HEALTH EFFECTS LANGUAGE**

- Explanation of the vulnerability of some populations to contaminants in drinking water. (Required) – CFR 141.154(a)
- Explanation of contaminants which may be reasonably expected to be found in drinking water, including bottled water. (Required)-141.153(h)(I)(iv)
- One of the following statements must be present.
  - Sources of Drinking Water-141.153 (h)(1)(I)
  - Contaminants That May Be Present in Source Water-141.153 (h)(1)(ii)
  - EPA and FDA Regulations-141.153 (h)(1)(iii)
- Information statements on arsenic, nitrate, and lead, if those contaminants are detected under conditions prescribed in the rule: - 141.154(b)-(d)
  - Arsenic at levels above 10 ppb (50%of the MCL), but below the MCL.
  - Nitrate at levels above 5 mg/l (50% of the MCL), but below the MCL.
  - Lead above the action level of 15 ppb in more than 5%, and up to and including 10%, of sites sampled (If 20 or more samples are collected).
- Total Trihalomethanes health effects language, if levels are detected above 0.080 mg/l, but below the Maximum Contaminant Level, as an annual average, must include health effects language prescribed by 40 CFR Part 141, Subpart O, Appendix C.

**.2.2 INFORMATION ON VIOLATIONS OF NATIONAL PRIMARY DRINKING WATER STANDARDS**

- Monitoring and reporting of compliance data.
- Recordkeeping of compliance data.
- Filtration and disinfection
- Lead and copper control requirements.

- Violation of the terms of a variance, an exemption, or a State or Federal administrative or judicial order.
- Violations must include the following information: explanation of violations, potential health effects, and corrective actions.

**.2.3 REQUIRED INFORMATION IF OPERATING UNDER A VARIANCE OR EXEMPTION.**

The Department does not currently issue any variances or exemptions. Should it decide to do so in the future, the following information must be provided by each public water system receiving a variance or an exemption.

- An explanation of the reasons for the variance or exemption.
- Date of issue.
- A brief status report on the steps the system is taking to comply with the terms and schedules of the variance or exemption.
- A notice of any opportunity for public input in the review, or renewal of the variance of exemption.

**.3 REPORT DELIVERY AND RECORDKEEPING REQUIREMENTS**

Delivery method is based on population served:

- CWSs serving 100,000 population or more persons must post its current year CCR to a publicly-accessible site on the Internet, do a direct mail out to each metered customer, and make the report available to the public upon request
- CWSs serving  $10,000 \leq 100,000$  population must do a direct mail out to each metered customer, and make the report available to the public upon request
- CWSs serving  $500 \leq 10,000$  population must publish the report in one or more local newspapers serving the area in which the system is located, or do a direct mail out and make the report available to the public upon request
- CWSs serving fewer than 500 persons have an option of the following: publish the report in one or more local newspapers serving the area in which the system is located, do a direct mail out, door-to-door delivery or by posting in an appropriate location and making the report available to the public upon request
- CWSs must mail to the Department:
  - (1) A copy of the CCR no later than the date the system is required to deliver the report to customers; and
  - (2) Within 3 months of the required CCR delivery date, a certification that the CCR was distributed to customers with information that is correct and consistent with compliance monitoring data
- CWSs must keep copies of CCR for at least three years

**.4 VIOLATIONS**

- Failure to produce and deliver the report to the public and provide a copy to the Department by the annual due dates as specified in the rule is classified as a Major Violation.
- Deficient in language, content, and/or meeting availability requirements is classified as a Minor Violation.

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## 8 CROSS CONNECTION CONTROL

This section describes the responsibilities of the Public Water System (PWS) and its water utility manager, water operator, or the designated Operator of Record for implementation of the water system's cross-connection control program (CCCP). The object of the CCCP is to protect the PWS's from contamination via backflow of water from an establishment's plumbing system or fire sprinkler system and the presence of cross-connections within those systems. If you have questions about the requirements described in this document contact the Cross-Connection Control Engineer at the Engineering Section.

### 8.1 AUTHORITY

There has always been a general requirement for cross-connection control and backflow prevention of the state's public water systems in the Arkansas Rules and Regulations Pertaining to Public Water Systems (RRPWS). However, in 1991, the Arkansas Department of Health added deadlines to the regulations requiring that all public water systems in Arkansas have a CCCP, for commercial and industrial customers, up-and-running by January 1, 1996. Furthermore, the program was to include recording the location of the backflow preventers and quality assurance via annual testing of the hardware by certified Assembly Test Technicians. Tracking the program is the responsibility of the PWS.

By way of further authority, a policy statement from the Department's Environmental Health Branch mandates a minimum of a "**containment**" type CCCP for all commercial and industrial establishments connected to public water systems.

### 8.2 STANDARDS

Standards have been developed for the implementation of the water utility's CCCP; namely, the *Minimum Standards for a Cross-Connection Control Program* and *Policy for Cross-Connection Control on Fire Protection Systems*. Where cross-connections are found within an establishment's plumbing system or a fire sprinkler system is present, or the potential for cross-connections exist, the PWS must be protected via backflow prevention assemblies meeting AWWA Standard C510 for double check valve assemblies (DC) or AWWA Standard C511 for reduced pressure type backflow prevention assemblies (RP). The DC is mainly used in fire sprinkler systems where chemicals are not used. The RP is used for all health hazard applications including fire sprinkler systems where chemicals are used. These standards were developed by the Engineering Section and are considered to be the acceptable minimum effort by the public water utilities.

However, be advised that a public water utility's cross-connection control policies may be more stringent than those of the Department, which is often the case.

### 8.3 CCCP COMPLIANCE

While it is the responsibility of the owners of establishments connected to public water systems to bear the expense of installation of cross-connection control hardware and having that hardware tested annually, the public water utility has the responsibility of keeping records of the location of the hardware and assuring that certified testers test the assemblies annually. These records must be made available, for inspection by Department staff members during the sanitary survey process. In addition, the Department sends out annual questionnaires to the PWS's to check on CCCP progress and upon request of the Cross-Connection Control Engineer of the Department.

Continued failure by a PWS to implement a CCCP may eventually result in the assessment of penalties.

### 8.4 DEPARTMENT ASSISTANCE

The Engineering Section has staff available to assist the PWSs in implementation of their CCCP. Copies of all cross-connection control documents are available from the Engineering Section free of charge. Most documents are also available on the Section's internet site, [www.healthy.arkansas.gov/eng](http://www.healthy.arkansas.gov/eng).

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## **9 EMERGENCY PLAN**

This section discusses the emergency planning requirements for public water systems.

### **9.1 AUTHORITY**

The Arkansas Rules and Regulations Pertaining to Public Water Systems (RRPPWS) are promulgated under the authority of Act 96 of 1913 and Act 8 of the Second Extraordinary Session of 1961, as amended. In the July 5, 1999, revision of RRPPWS, Section VII, Part G. Emergency Planning states:

Each Community Public Water System and each Non-Transient Non-Community Public Water System shall have a written emergency plan. The emergency plan shall include, at a minimum, names and telephone numbers of responsible utility personnel, procedures to be followed in the event of loss of source, treatment, storage, or distribution facilities, and procedures to be followed in the event of a loss of distribution system pressure or a known or suspected introduction of contaminants into the distribution system.

### **9.2 OTHER REGULATIONS**

Many, but not all water systems are considered “**facilities**” under the federal The Emergency Planning and Community Right to Know Act of 1986. This act is also known as SARA Title III. Under this act, “**facilities**” are required to report the use and storage of extremely hazardous substances, such as chlorine, to various federal and local agencies. The United States Environmental Protection Agency (EPA) is responsible for implementation of this Act. The Occupational Safety and Health Administration (OSHA) also has regulations that may affect public water systems.

### **9.3 EMERGENCY PLANNING**

Emergency planning assistance can be found in Appendix E.

A model emergency plan for smaller systems can be found in Appendix F.

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## 10 EMERGENCY SITUATION REPORTING

This section discusses the emergency situation reporting requirements of the Arkansas Department of Health for public water systems.

### 10.1 AUTHORITY

Arkansas Rules and Regulations Pertaining to Public Water Systems (RRPPWS) are promulgated under the authority of Act 96 of 1913 and Act 8 of the Second Extraordinary Session of 1961, as amended. The RRPPWS, Section XVII, A., Notification of the Department states:

The owner shall report to the Arkansas Department of Health within four hours of the discovery and evaluation of any emergency condition located in the water system, which affects the ability of the water system to deliver adequate quantities of safe water to its customers. Examples of such emergencies include loss of pressure in the distribution system, failure of the source or treatment facility or parts thereof, voluntary or mandatory water conservation efforts, or the known or suspected introduction of any contaminant into the water system.

### 10.2 ARKANSAS DEPARTMENT OF HEALTH NOTIFICATION

RRPPWS require the notification of the Department within four hours of the discovery and evaluation of any emergency condition. The Department may be contacted through its Emergency Communications Center 24 hours a day, 365 days a year. For emergency communications after normal working hours, use 1-800-554-5738. This toll free number is for emergency use only.

### 10.3 EMERGENCY REPORTING – DURING NORMAL BUSINESS HOURS

ADH Emergency Communications Center For emergency use only	(501) 661-2136 (800) 554-5738 FAX (501) 661-2468
Arkansas Department of Health Main Number	(501) 661-2000
<b>Engineering Section</b>	<b>(501) 661-2623</b> (800) 462-0599 FAX (501) 661-2032
Radiation Control and Emergency Management	(501) 661-2301
Division of Epidemiology	(501) 661-2893
Division of Emergency Medical Services	(501) 661-2262

### 10.4 EMERGENCY REPORTING – OUTSIDE NORMAL BUSINESS HOURS

Emergency Communications Center	(501) 661-2136 (800) 554-5738
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Staff in the Emergency Communication Center will not directly handle your emergency. They will contact appropriate Department staff to respond to the situation.

## 10.5 CUSTOMER NOTIFICATION

In the event of an emergency, the water system must make a reasonable effort to notify the effected customers and the general public. Examples would include door-to-door notification either verbally or with the use of door hangers, telephoning effected customers, posting notices in the area or in locations where the majority of the effected customers will see the notice, media notification through the Associated Press, or direct notification of local newspapers, radio stations, and television stations.

Notification of the public is problematic. Individual notification by door hangers or by telephone is only feasible for small water systems or small portions of larger water systems. Posting notices is problematic because it is difficult to find locations where all effected customers will see and read the notice. Newspaper notification is problematic because of the time delay in printing and distribution, especially if the paper is not a daily paper. Also, not every customer will receive and read the newspaper promptly. Electronic media such as radio stations and television stations may be the best way to reach a large population, but not everybody listens to radio stations or watches television stations. In addition, there is no requirement for radio or television stations to broadcast your emergency message.

## 10.6 TYPES OF NOTIFICATIONS

Any of the following orders or other types of orders could be issued either by the Water System, by the Department, or jointly by the Water System and the Department. If you are unsure of the need to issue an order, or of the type of order to issue, contact the Engineering Section at the telephone numbers listed in section 10.3 of this chapter.

### 10.6.1 BOIL WATER ORDERS

Boil water orders are appropriate for actual or suspected contaminates which are destroyed or inactivated by the heat of boiling. Boiling is appropriate for microbiological contamination. Boiling is **not** appropriate for contaminates which are unaffected by the heat of boiling. For example, boiling will not remove lead or other metals from the water. Boiling water containing lead or other metals will actually increase the concentration of the lead or the other metals due to the loss of water as steam during boiling. For additional information on Boil Water Orders see the Department policy on Boil Water Orders.

### 10.6.2 DO NOT DRINK ORDERS

**Do not drink orders** are appropriate for actual or suspected contaminates which are not destroyed or inactivated by the heat of boiling but are not hazardous for uses such as flushing toilets, bathing, or washing. For example, certain levels of nitrates in the water are hazardous for young children to drink. The nitrates will not be removed by boiling, yet the water could safely be used for flushing toilets, bathing, or washing.

### 10.6.3 DO NOT USE ORDERS

**Do not use orders** are appropriate for actual or suspected contaminates which are considered hazardous for any use of the water. For example, the presence of propane gas (this has occurred in Arkansas) in the water in a sufficient concentration to cause a fire or explosion hazard would be cause for a do not use order.

### 10.6.4 VOLUNTARY WATER CONSERVATION ORDER

A voluntary water conservation order is appropriate when the quality of the water is adequate, but there is only a marginally adequate quantity of water. For example, one of the well pumps has broken down and the other wells must run at or near 100% of capacity to maintain storage tank levels. Typically, a voluntary water conservation order would ask people not to wash cars, water yards and gardens, fill pools, or at least restrict the amount of water used. High water users such as industries may be directly asked to cut back on water usage.

#### **10.6.5 MANDATORY WATER CONSERVATION ORDER**

A mandatory water conservation order differs from a voluntary order in that the water system may take sanctions against customers whom fail to comply with the mandatory water conservation order. Sanctions could include termination of water service for the duration of the emergency. Typically, one warning would be given, and if the customer fails to comply, water service would be terminated. Mandatory water conservation orders are appropriate when the water quantity available is inadequate to the point that continued normal usage would result in the emptying of storage tanks and the depressurization of the distribution system. The Department needs to be notified of conservation orders.

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# 11 LEAD & COPPER RULE MONITORING

This section outlines Lead and Copper Tap Monitoring requirements and interpretation for Public Water Systems. Specific requirements and details are listed in 40 CFR 141 and 142 Vol. 56 of the Code of Federal Regulations. If you have any questions related to this document, contact the Arkansas Department of Health; Engineering Section at (501) 661-2623.

## 11.1 AUTHORITY

Under the Safe Drinking Water Act, and National Primary Drinking Water Regulation for Lead and Copper as cited in 40 CFR Parts 141 and 142 Vol. 56, all community and non-transient non-community public water systems are required to test for Lead and Copper at the customer's tap.

## 11.2 PREPARE TAP MONITORING PLAN (Site Plan)

The initial step in this process is to establish a Lead/Copper sample site plan based on population served.

Population Served	Number of Sites
25-100	5
101-500	10
501-3300	20
3301-10,000	40
10,001-100,000	60

At potential sampling sites, the PWS should:

- Perform a piping materials and site evaluation. Instructions are mailed to each system.
- Select sampling locations; all should be high-risk (Tier 1) homes if possible.
- Obtain state approval of plan.

Tier 1 are single family houses with internal lead pipes, lead service lines, or copper pipe with lead solder installed or built after 1982.

Tier 2 are other buildings with internal lead pipe, lead service line or copper lines with lead solder installed after 1982.

Tier 3 are single family houses with lead solder built before 1983.

Tier 4 is reserved for PVC pipes or sites that do not fall within the first three categories.

## 11.3 INITIAL MONITORING

A public water system must complete two consecutive 6-month initial monitoring periods. One monitoring period is between January 1<sup>st</sup> and June 30<sup>th</sup> and a second between July 1<sup>st</sup> to December 31<sup>st</sup> of each year.

### 11.4 FIRST 6-MONTH MONITORING PERIOD

- Perform tap sampling of highest tier levels available. Customers collect samples in bottles supplied by the Department from a cold water kitchen tap after six to twelve hours of non-usage.

### 11.5 SECOND 6-MONTH MONITORING PERIOD

- Perform tap sampling, at same sites if possible. Customers collect samples in bottles supplied by the Department from a cold water kitchen tap after six to twelve hours of non-usage.

Include explanation if any sites are different.

If a system does not exceed the 90th percentile lead or copper action levels in either initial monitoring period, it is allowed to go to reduced monitoring. Action level for lead is 0.015 mg/L and copper is 1.3 mg/L.

If a system exceeds the 90<sup>th</sup> percentile lead or copper action levels in either initial monitoring period it can not go to reduced monitoring and must start the corrosion control process as stated in 40 CFR 141 and 142 Vol. 56 section V (C).

## **11.6 REDUCED MONITORING**

A system must successfully complete two consecutive initial monitoring periods before it can advance to reduced monitoring. There are two levels of reduced monitoring.

- Follow state recommendations of reduced monitoring (yearly at one half of the original number of sites, minimum of 5 for 3 consecutive years).
- Reduced monitoring must be performed in the summer months, between June 1<sup>st</sup> and September 30<sup>th</sup> of each year.
- A system must complete 3 consecutive sampling periods (3 years) without exceeding the action level for lead or copper before sample requirements are further reduced to once every three years.
- Perform tap sampling of highest tier levels available. Customers collect samples in bottles supplied by the Department from a cold water kitchen tap after six to twelve hours of non-usage.
- The operator is responsible for having the samples at a designated pick up point for collection by a Department representative for transport to the Department's laboratory.

## **11.7 SAMPLE COLLECTION RESPONSIBILITIES**

- The Department will notify systems by mail of their sampling schedule prior to assigned collection and pick up date. Sampling materials will be forwarded to the system prior to its scheduled sampling date.
- The water system is responsible for arranging sample collection at the required residences in accordance with sampling requirements.
- The water system is responsible for delivering samples to the Department's Local Health Unit. Samples may also be taken to the Engineering Section of the Department at 4815 West Markham, Little Rock, Arkansas.

## **11.8 RECORD KEEPING**

Systems are required to maintain Lead and Copper results for twelve (12) years. Optimal Corrosion Control records are kept indefinitely.

## **11.9 WHEN ACTION LEVELS ARE EXCEEDED:**

If the 90<sup>th</sup> percentile for lead is above 0.015 mg/L or copper is above 1.3 mg/L refer to Lead/Copper Corrosion Control Summary.

## **11.10 EXCEEDED ACTION LEVEL BASIC REQUIREMENTS**

Small and medium water systems that exceed the lead and/or copper action levels are required to submit a proposed optimal corrosion control plan (OCCT) to the State within 6 months of exceeding the action level(s).

State must designate the OCCT within 18 months for medium systems and 24 months for small systems after action levels are exceeded.

OCCT must be installed within 24 months after State designates OCCT.

Systems must evaluate the effectiveness of each of the following treatments or combination of treatments to identify the OCCT for that system:

- Alkalinity and pH adjustment
- Calcium hardness adjustment
- Addition of phosphate or silica based corrosion inhibitor

Lead and copper monitoring must be completed within 36 months after treatment is designated.

State must review treatment installation and designate water quality operating parameters within 6 months after follow-up monitoring is completed.

System must continue to operate in compliance with State specified operating parameters.

System must continue to monitor until action levels are no longer exceeded.

Systems are placed on routine tap sampling.

The complete summary of the Lead and Copper Control Summary may be obtained by contacting the Lead and Copper Program Coordinator at the Engineering Section.

#### **11.11 PUBLIC EDUCATION REQUIREMENTS**

Public Education will be required by the water system whenever the action level for lead is exceeded. This will be accomplished by distributing pamphlets, bill stuffers, newspaper articles and Public Service Announcements on electronic media. Public Education must be continued as long as the action level for lead is exceeded. Contact the Lead and Copper Program Coordinator for guidance and the materials needed to conduct Public Education.

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## **12 WATER SYSTEM PLANNING AND CAPACITY DEVELOPMENT**

### **12.1 AUTHORITY**

Section VII.H. of the Arkansas Rules and Regulations Pertaining to Public Water Systems requires each community public water system and each non-transient non-community public water system to have a written long-range plan. The long-range plan shall cover a planning period of at least ten years and should be updated every 5 years. Items the plan shall address at minimum include projected needs for source, treatment, storage and distribution. Also, the plan shall demonstrate the system's technical, financial, and managerial capacity as required by the state's Existing System Capacity Development Strategy to comply with Section 1420(c) of the Safe Drinking Water Act.

### **12.2 GUIDELINES**

#### **12.2.1 ITEMS PERTAINING TO TECHNICAL CAPACITY**

1. A discussion of the water system's ability to consistently provide an ample quantity of safe drinking water to its customers, including such items as water use data, projected water use, regulatory compliance, etc.
2. A description of all major projects and expansions anticipated within the planning period.
3. A discussion and brief analysis of possible alternatives to the planned projects and expansions; including such items as interconnection with a neighboring system, purchased water arrangements, alternate ownership, and management arrangements.
4. Hydraulic analyses of the distribution system at all pertinent flows and storage tank levels anticipated within the planning period.
5. A discussion of source water adequacy, for both quality and quantity concerns, for the planning period.
6. A discussion of the adequacy of source water protection areas and measures to control potential contaminants, including any applicable legal authority to implement such measures.
7. A discussion of the current adequacy of water treatment processes and their projected performance and adequacy for the planning period.
8. A discussion of how the water system plans to address any waste disposal issues occurring due to water treatment, (e.g. sludge, backwash water, etc.).
9. Documentation that the water system currently has a sufficient number of properly licensed operators, and plans that the water system has for maintaining a sufficient number of properly licensed operators for the planning period.
10. A listing of any laboratory/water quality monitoring needs anticipated within the planning period.
11. A discussion of the water system's planning efforts to insure compliance with applicable state and federal regulations anticipated to be finalized within the planning period.
12. A statement of compliance with section XIV.F of the Rules and Regulations Pertaining to Public Water Systems regarding plumbing inspection and sewage disposal requirements, and a description of the system's legal authority to implement the requirements.
13. A statement of compliance with section VII.E of the Rules and Regulations Pertaining to Public Water Systems regarding the establishment of a cross-connection control program, and a description of the system's legal authority to implement the requirements.
14. A discussion of deficiencies listed in the water system's sanitary survey that would result in major capital expenditures, and how those deficiencies will be addressed.
15. Other items as appropriate for documenting and/or maintaining the water system's Technical Capacity.

#### **12.2.2 ITEMS PERTAINING TO MANAGERIAL CAPACITY**

1. A clear identification of the owner or other responsible legal body for the water system.
2. A commitment from the owner or controlling body to adhere to and periodically review and update the Long-Range Plan.
3. An organizational chart for the water system, showing all staff and their role in the organization. Also indicate any license or certification requirements of the positions.
4. A discussion of any anticipated or on-going operator training and certification efforts.
5. A general operation and management plan for the water system, addressing such items as: routine inspections, planned equipment replacements, equipment calibration, emergency procedures, record keeping, reporting and similar activities

6. A discussion of the billing and collection procedure to address such items as: Is water use metered or estimated? If estimated, what is the basis for the estimate? If metered, who reads the meters? Are the meters tested periodically? What is the bill collection success rate? Please include any procedures in place to manage delinquent accounts. Are revenues collected sufficient for current and future operation of system?
7. An evaluation of unaccounted for water, and a discussion of plans to address any excessive losses.
8. A listing of any standing O&M contract(s) and the relative responsibilities of the water system and contractor(s) relating to each contract.
9. A statement of compliance with section VII.G of the Rules and Regulations Pertaining to Public Water Systems regarding emergency planning, and a description of the system's legal authority to implement the requirements.
10. A discussion of the adequacy of the spare parts inventory on hand for repairs.
11. A discussion of the adequacy of the chemical supply inventory on hand.
12. A discussion of the water system's existing safety program for chemical handling and other work area activities.
13. Other items as appropriate for documenting and/or maintaining the water system's Managerial Capacity.

### **12.2.3 ITEMS PERTAINING TO FINANCIAL CAPACITY**

1. A forecast of all future capital needs and operating expenses to meet Safe Drinking Water Act requirements, infrastructure rehabilitation, and system expansion
2. A cash flow analysis to demonstrate revenue sufficiency
3. An operating budget to include such items as: depreciation, reserves, debt service, O&M, salaries, etc.
4. Other items as appropriate for documenting and/or maintaining the water system's Financial Capacity.

## **13 MONTHLY OPERATING REPORT**

This section covers the submittal of the monthly operating report by the public water system. The monthly operating report shall contain complete information on water treated, amounts and concentrations of chemicals added to the water system, and other treatment plant operating measurements

### **13.1 AUTHORITY**

Section VII B of the Arkansas Rules & Regulations Pertaining to Public Water Systems states: "The owner shall make such suitable analyses and keep such records of operation as required by the Arkansas Department of Health. True and accurate reports of such analyses and operational records for each month shall be submitted to the Department by the tenth day of the following month."

### **13.2 PROCEDURES**

- 13.2.1** In December of each year, the Department provides each water system with a year's supply of standard forms for submitting the monthly operating report. The public water system may use a customized form that provides the same information in a similar format.
- 13.2.2** Each day, a certified water operator shall make such measurements and readings needed to complete the monthly operating report and enter the values in the appropriate space on the form. At the end of each month, the certified operator in responsible charge for the water treatment / pumping facility shall sign the report, thereby verifying its accuracy, and submit it to the Department's Engineering Section.
- 13.2.3** Copies of reports shall be kept in a central location, convenient for the public to view upon request (Freedom of Information Act).
- 13.2.4** Additional copies of blank monthly operating reports can be obtained from the Engineering Section at (501) 661-2623.

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## **14 NEW SERVICE CONNECTION REQUIREMENTS**

### **14.1 APPROVED SEWAGE DISPOSAL REQUIRED**

Section XIV F of the “Arkansas Rules & Regulations Pertaining to Public Water Systems” states: “No public water system shall provide service to a new building or residence in an unsewered area until the customer provides written documentation that the Department of Health has approved plans for construction of a sewage disposal facility for the building or residence, or that no disposal system approval is required by the Department for the building.”

#### **14.1.1 PROCEDURES**

Prior to installation of a water meter completing any new service connection where that water service has no access to a reasonably available community sewerage system:

**14.1.1.1** An ‘individual sewerage disposal permit’ must be obtained by the customer from the Local Health Unit’s Environmental Health Specialist (County Sanitarian) and a copy forwarded to the Public Water System providing the service. “Individual sewerage disposal” requirements are detailed in the “Rules and Regulations Pertaining to Onsite Wastewater” (Ark. Code Ann. § 14-236-101 et seq.).

**14.1.1.2** If an individual sewage disposal permit is not required by “Rules and Regulations Pertaining to Onsite Wastewater”, such as for lots greater than 10 acres in size, the water system shall require the customer to provide written documentation from the County Environmental Health Specialist that a permit is not required.

**14.1.1.** Upon receiving the required documentation, the water system may provide the water service.

#### **14.1.2 TEMPORARY CONSTRUCTION SERVICE**

Temporary service for construction purposes, in unsewered areas, may be provided only after compliance with Section XIV.F.1, of the RRPWS. (Section 14.1, above)

### **14.2 PLUMBING INSPECTION REQUIRED**

Section XIV F of the “Arkansas Rules & Regulations Pertaining to Public Water Systems” states: No public water system shall provide new service to any building or residence until the customer provides written documentation that the service line and building plumbing were inspected by the system’s certified plumbing inspector, and found to be in substantial compliance with the State Plumbing Code (Rules and Regulations Governing Construction, Installation, and Inspection of Plumbing and Drainage).

#### **14.2.1 NO SYSTEM PLUMBING INSPECTOR**

If the system has no certified plumbing inspector, the written documentation shall be obtained from the Department of Health’s Area Plumbing Inspector or a certified inspector designated by the Area Inspector. It is permissible for multiple public water systems to utilize a joint certified plumbing inspector.

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# 15 LICENSED OPERATOR REQUIREMENTS

## 15.1 Authority

Licensing requirements for public water system operators are contained in the “Water Operator Licensing Law” Act 333 of 1957 as amended and its “Rules and Regulations Pertaining to Water Operator Licensing”. (See Appendix C and D.)

## 15.2 Purpose

In order to protect the public health, operators are required to license. This ensures that personnel who have shown their competence and knowledge of public health and scientific principals necessary to produce and deliver adequate quantities of water that meets or exceeds the National Primary and Secondary Drinking Water Standards operate public water systems.

## 15.3 LICENSE REQUIRED

All operators of a community public water system, non-transient non-community public water system, or any transient non-community public water system utilizing a surface water or surface water influenced source shall be licensed and certified as competent. (All these system types are referred to, in this chapter, as Licensed Required Public Water System.)

An operator is defined as:

Any person who, during the performance of their regular duties at a Licensed Required Public Water System, exercise individual judgment by which, whether directly or indirectly, the safety, quality, and quantity of water delivered from the water system might be affected.

It is unlawful for any person or authority (city, water association) that furnishes water for domestic consumption to operate any Licensed Required Public Water System, unless the operator in charge is duly licensed and certified competent by the Arkansas Department of Health. It is unlawful for any person to perform the duties of an operator without being duly licensed or to falsely represent themselves as licensed operators. It is unlawful for any public or private official, not duly licensed, to influence the judgment of a licensed operator in matters where the public health may be involved, unless this official is an authorized representative of the Department.

A Licensed Required Public Water System is classified as to what Treatment license grade is required for its supervisory personnel by a combination of the complexity of treatment processes, chemicals added and the total population served by the plant. A Licensed Required Public Water System is classified as to what Distribution license grade is required for its supervisory personnel by a combination of the complexity of distribution system, which can include a well source supply and chlorination equipment, and the population of the distribution system operated by the Licensed Required Public Water System.

Operators that are required to operate treatment processes are required to hold a Treatment License. Operators that are required to operate the distribution system are required to hold a Distribution License. Operators that are not supervisory over the plant or the distribution system are allowed to license one grade lower then the system required license grade. The operator’s required license type and grade is based upon the grade requirement of the Licensed Required Public Water System operated and the duties performed by the operator.

## 15.4 OBTAINING THE LICENSE

### 15.4.1 LICENSE APPLICATION REQUIREMENT

To obtain a license the operator must file a fully completed license application with the required \$35.00 in fees, which is the exam fee of \$25.00 and the license fee of \$10.00, 60 days prior to setting for the exam. Upon receipt of a completed application, examination study materials and exam schedule are provided to the applicant. The application is held for one year after it is filed or one year after the last file activity such as the taking of an exam. Another license examination fee is required for each additional examination required. The additional examination fee must be paid 45 days prior to setting for the examination. A new License application and fees are required for all additional licenses. Fees are not refundable or transferable to another operator.

### 15.4.2 EXAM REGISTRATION – PAPER BASED

Paper, classroom style License Examinations require registration/scheduling the exam a minimum of 45 days prior to the desired quarterly exam session date. To register use this webpage:

[https://health.arkansas.gov/wa\\_engTraining/ExamRegistration.aspx](https://health.arkansas.gov/wa_engTraining/ExamRegistration.aspx)

or contact the Water Operator Licensing Program. Exam session schedule is at this webpage:

<http://www.healthy.arkansas.gov/eng/autoupdates/oper/operexam.htm>. To be eligible to register for an exam, the examinee must have the required license application submitted, required exam fee paid, and document the ability to meet the mandatory training attendance requirements by the time of examination. Failure to attend the registered exam session may result in the forfeiture of the exam fee.

### 15.4.3 EXAM REGISTRATION – COMPUTER BASED

Computer-based, web-accessed Water License Examinations are available through Applied Measurement Professionals (AMP). AMP will provide the exam in their Testing Centers. This will allow exam scheduling with two weeks' notice. AMP provides exams Monday through Saturday, with morning and afternoon start times. To utilize AMP, the Water Operator Licensing Program must be in receipt of the examinee's Water Operator License application, the required ADH exam fee, and meet the mandatory training requirements. The examinee will need to notify the Water License Program of the desire to use AMP to obtain exam access credentials and then make a reservation to sit for the exam with AMP. AMP has an administration/sitting fee of \$64.00 for this optional service not included in ADH required fees and the fee must be paid directly to AMP. Any AMP Testing Centers may be utilized. Amp has conveniently located sites in Fayetteville, AR; Little Rock, AR; and Memphis, TN. See AMP's website, [www.goamp.com](http://www.goamp.com) for additional site information and examination concepts. The exams are administered via a computer terminal. A practice exam to become familiar with the computer process is available at the time of examination. The process is very user friendly and suitable for non-computer users.

### 15.4.4 TRAINING REQUIREMENTS

Specific training courses are required prior to setting for each license exam. The mandatory training ranges from 40 contact hours of prescribed basic courses for the lowest license grades to 96 contact hours of prescribed basic and more advanced courses for the highest-grade licenses. Please see Table 1 below for specific training hours required.

TRAINING HOUR REQUIREMENTS FOR LICENSE EXAMS										
Course Name	Length	D-VSS	D-1	D-2	D-3	D-4	T-1	T-2	T-3	T-4
Rules, Regs, SDWA Compliance	8 hr	X	X	X	X	X	X	X	X	X
Basic Water Works Math	8 hr.	X	X	X	X	X	X	X	X	X
Applied Water Works Math	8 hr.			X	X	X		X	X	X
Distribution Basic	24 hr.	X	X	X	X	X				
Distribution Intermediate	24 hr.			X	X	X				
Distribution Advanced	24 hr.					X				
Treatment Basic	24 hr.						X	X	X	X
Treatment Intermediate	24 hr.							X	X	X
Treatment Advanced	24 hr.								X	X
	Tot. hrs.	40	40	72	72	96	40	72	96	96

#### 15.4.5 EXPERIENCE REQUIREMENTS

The operator is not required to have any certain amount of experience prior to the examination. Upon successful completion of the appropriate license examination and meeting the experience requirement, the license is issued. The meeting of the License Experience requirement requires the work experience to be from work or the supervision of work that is directly related to the license being obtained. If an operator passes the license examination prior to meeting the experience requirement, a renewable Operator-In-Training (OIT) certificate is issued. The license is issued when the experience requirement is documented as met.

<b>Evaluation of the Experience requirement shall be based on completion of the following periods of approved work:</b>	
Grade IV Treatment License	Three (3) years
Grade IV Distribution License	Three (3) years
Grade III Treatment License	Two (2) years
Grade III Distribution License	Two (2) years
Grade II Treatment License	One (1) Year
Grade II Distribution License	One (1) year
Grade I Treatment License	Six (6) months
Grade I Distribution License	Six (6) Months
Small System Distribution License	No experience requirement

Table 2

#### 15.5 MAINTAINING THE LICENSE

To maintain a license or OIT certificate the operator must obtain and document at the time of license renewal 24 contact hours of approved renewal training during each two (2) year renewal period or the equivalent of one hour of training per month during the first partial renewal period. All water operator licenses held by an operator can be renewed utilizing the same 24 hours of training.

Training renewal hours are in two classifications or types of training, which are directly applicable and indirectly applicable. To renew a license requires that at least 12 of the required 24 training hours must be directly applicable training. This is a new requirement that will be implemented with the start of the July 1, 2003 to June 30, 2005 renewal period.

All Licenses or OIT certificates expire June 30th of each odd numbered year. To renew each license or OIT the operator must submit his or her renewal training documentation and the \$10.00 per license or OIT renewal fee. These items should be returned with your billing statement, which you will receive in June of each renewal year. To remain valid the license must be renewed within 90 days after it expires or it is lapsed and is invalid. A lapsed license may be reinstated up to one (1) year after its expiration date.

An operator's Licenses or OIT certificates may be suspended and/or revoked when reasonable care, judgement, or the application of the operator's knowledge or ability are not used in the performance of their duties. They may also be suspended and/or revoked when it is found that an operator has practiced fraud or deception, or that the operator is incompetent or unable to perform their duties properly.

#### 15.6 COMPLIANCE PENALTIES

Failure to comply with Water Operator licensing requirements can result in the Water System, its owner and the operator receiving an Administrative Penalty, fines and /or imprisonment.

A public water system required to have a licensed operator must have an "Operator in Responsible Charge" holding the system required license(s) and adequate properly licensed operators available at all times to comply with the law and regulations. A system without adequate licensed staff is in violation and must comply by obtaining adequate licensed staff. A Licensed Required Public Water System without adequate licensed staff are offered a Consent Order to allow the system time to become compliant. However, the Consent Order requires the system to

admit it is in violation and then agree to the provisions of the Order. The Order will be an agreement between the Public Water System and the Department that establishing a compliance deadline with compliance conditions that must be met. Failure to meet the compliance conditions and/or deadlines will results in the assessment of the established penalties contained in the Consent Order.

System compliance issues require current and timely information on which systems an operator is operating. In order to maintain this needed data, all operators must notify the Water Operator Licensing Program in writing of any change in their employment, contract operation or volunteer status with a public water system.

#### **15.7 DRINKING WATER ADVISORY AND OPERATOR LICENSING COMMITTEE**

The Arkansas Drinking Water Advisory and Operator Licensing Committee's purpose is to advise the Arkansas Board of Health and the Department in all matters related to the Water Operator Licensing Program and the Public Water System Supervision Program. The Committee consists of seven (7) members, appointed by the Board of Health, four (4) of which must be operators, holding the highest grade licenses, one must be an engineer on the teaching staff of any state supported school, one must be a consulting engineer and one must be an engineer on the staff of the Engineering Section of the Department.

## **16 PLAN REVIEW & APPROVAL REQUIREMENT**

### **16.1 PUBLIC WATER SYSTEM AUTHORITY**

Section XXI Part A of the Arkansas Rules and Regulations Pertaining to Public Water Systems requires the following: “The owner or his authorized agent shall submit two complete sets of engineering plans and specifications to, and receive written approval of, the Arkansas Department of Health , before constructing or entering into contract to construct a water supply system, source of supply, water purification plant and/or distribution system, or any alterations thereto. Thereafter such engineering plans and specifications must be adhered to unless deviations are submitted to, and receive written approval of the Department. The Department may, upon approval of a written agreement between the owner and the Department, delegate plan review responsibility for minor distribution improvements to the owner.”

### **16.2 PROCEDURES**

Included under this requirement are: extension of distribution lines for either residential or commercial developments, new storage tanks, painting of existing storage tanks, new treatment plants, proposed changes in treatment equipment or chemicals, development of a new water source, modifications to an existing water source or intake, fire main extensions, sprinkler connections, etc.

Also required are a plan review fee and a cost estimate on that part of the project that the Department reviews. The review fee is 1% of the estimated cost, with a minimum fee of \$50 and a maximum fee of \$500.

The submittal may need to include hydraulic calculations or basis of design for the project. For a small project connecting to a municipal system, such information is normally not necessary; however, it may be required on any project if deemed necessary to complete the review.

The following criteria are used in review of the plans and specifications: Department regulations and criteria, applicable federal regulations, Recommended Standards for Water Works (Upper Mississippi River - Great Lakes Board of State Sanitary Engineers, also commonly known as the Ten States Standards), American Water Works Association Standards, and ASTM Standards.

Common submittal omissions that delay the approval or require a comment letter include: documentation of existing conditions, the basis of the engineering design, insufficient design calculations, missing or incomplete specifications, lack of a professional engineer's stamp, missing or improper review fee, inadequate separation of water and sewer lines, and the lack of defined easements for main extensions on private property.

### **16.3 TREATMENT AND DISPOSAL OF HUMAN WASTE**

The Rules and Regulations Pertaining to General Sanitation are duly adopted and promulgated by the Arkansas Board of Health pursuant to the authority expressly conferred by the laws of the State of Arkansas including, without limitation, Act 96 of 1913 (Ark. Code Ann.§ 20-7-101, et seq.).

The General Sanitation Regulations assist PWSs in maintaining source and distribution system water quality by regulations related to the treatment and disposal of human waste. The regulations require plan review by the Engineering Section for public sewer systems improvements (collection and treatment). The regulations require plan review by the Environmental Health Protection Section of the Department for individual sewage disposal treatment systems. The reviews are performed to determine the improvements will not cause a public health nuisance. Please review the regulations for specific plan review requirements. A copy of the regulations is available on the Department's website at:

<http://www.healthy.arkansas.gov/programsServices/environmentalHealth/generalSanitation/Pages/default.aspx>

The regulations allow the Department to address environmental sanitation concerns creating a public health nuisance. The regulations can be useful to PWSs in wellhead or watershed protection activities, and Section VII, Part C requires connection to a public sewer system of all homes and businesses located within 300 feet and having adequate access.

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# 17 PUBLIC NOTIFICATION

## 17.1 AUTHORITY

Public Notification is required as part of the Safe Drinking Water Act [Section 1414 (c)] and is intended to provide information to those served by the water system whenever a violation of the National Primary Drinking Water Regulations (NPDWR) occurs or in other situations which may pose a risk to public health. The Public Notification Rule of 2000 is a revision of the NPDWR and is found in 40 CFR Parts 9, 141 Subparts O & Q, 142, and 143. A summary of the Public Notification Rule PNR or a copy of the regulation can be found at: <http://water.epa.gov/lawsregs/rulesregs/sdwa/publicnotification/>.

### OVERVIEW

Owners of public water systems must provide notice of any violation of the NPDWR and other defined instances. Public notification is divided into one of three tiers depending on the type of violation or the particular incident. Notices must be given within the defined time frames, must conform to a defined format, and must be distributed in a specified manner. A copy of the notice must be provided to the Arkansas Department of Health. Delivery requirements for community water systems and non-community water systems differ but must be designed to reach residential, transient, and non-transient users of the system. Additionally, every new billing customer or hookup must be notified of any ongoing violations.

## 17.2 PROCEDURES

Public notice is required for any of the following violations:

1. NPDWR Violations
  - Exceedances of maximum contaminant levels (MCLs) or maximum residual disinfectant level (MRDL).
  - Treatment techniques (TT) violations.
  - Monitoring and testing procedure violations
  
2. Variances and exemptions
  - Operating under a variance or exemption
  - Failure to comply with the schedule of a variance or exemption.
  
3. Other situations (not violations) which require notice include:
  - Occurrence of a waterborne disease outbreak or waterborne emergency.
  - Exceedance of the secondary maximum contaminant level for fluoride
  - Availability of unregulated contaminant monitoring results.
  - Other situations as determined by the Department.

<b>Tier</b>	<b>Violation/Situation</b>	<b>Notification Method *</b>	<b>Time Frame</b>
1	<ul style="list-style-type: none"> <li>- Acute MCL (when <i>E.coli</i> presence is confirmed). Failure to test for <i>E. coli</i> following a positive total coliform result. Failure to conduct all repeat monitoring following an <i>E.coli</i> positive routine sample.</li> <li>- MCL of chlorine dioxide, nitrate, nitrite, or total nitrate and nitrite or failure to collect a confirmation sample.</li> <li>- Acute MCL for chlorine dioxide.</li> <li>- Failure to consult with the state following a turbidity exceedance of 1 NTU.</li> <li>- Occurrence of a waterborne disease outbreak or a boil water notice for contaminated water.</li> </ul>	CPWS & NCPWS: One or more of a, b, or c, or another method if approved in writing by the state.	Within 24 hours
2	<ul style="list-style-type: none"> <li>- All MCL, MRDL, and treatment technique violations not classified as Tier 1.</li> <li>- Failure to comply with the terms and conditions</li> </ul>	CPWS: d and e. NCPWS: b or d and e.	Within 30 days

	of any variance or exemption.		
3	<ul style="list-style-type: none"> <li>- Bacteriological and SWTR (turbidity, pH, chlorine) Monitoring violations.</li> <li>- Chemical monitoring violations.</li> <li>- Failure to comply with a testing procedure.</li> <li>- Operating under a variance or exemption/</li> <li>- Availability of unregulated contaminant monitoring results.</li> <li>- Exceedance of the secondary fluoride MCL.</li> </ul>	CPWS: d and e; <u>or</u> f if delivered in the same manner. NCPWS: b or d and e; <u>or</u> f if delivered in the same manner.	Within 1 year

CPWS= Community Public Water Systems  
 NCPWS = Noncommunity Public Water Systems

\* Method of notification

- a. Broadcast media such as radio and television
- b. Posting of the notice in conspicuous places throughout the service area for as long as the violation or situation persists but not less than seven days.
- c. Hand delivery to persons served by the system
- d. Mail or other direct delivery to each billed customer and to other service connections receiving water from the system.
- e. Any other method reasonably calculated to reach customers not notified by b or d [Examples: a, c, local newspaper notice; newsletter notice; delivery to community organizations and community centers; delivery to landlords, nursing homes, prisons, etc. (for those customers not receiving a water bill or at a service connection address); e-mail or Internet notice].
- f. Part of the annual Consumer Confidence Report or a similar annual report containing the required information outlined below.

**17.2.1 REQUIRED INFORMATION**

Your public notice must include specific information in order to be considered complete. For each violation and for the occurrence of a waterborne disease outbreak, you must provide a clear and readily understandable explanation of the following:

1. The violation, including the contaminant of concern, and (as applicable) the contaminant level;
2. When the violation or situation occurred;
3. Any potential adverse health effects from drinking the water including mandatory language provided by EPA;
4. The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;
5. Whether alternative water supplies should be used;
6. What actions consumers should take, including when they should seek medical help, if known;
7. What you are doing to correct the violation;
8. When you expect to return to compliance;
9. The name, business address, and phone number of the owner, operator, or designee of the water system as a source for additional information.
10. A statement encouraging notice recipients to distribute the notice to other persons served.

Some required elements may not be applicable to your violation. However, you must still address the element in the notice. For example, if it is unnecessary for consumers to boil their water or drink bottled water, you should tell them they do not need to do so. You should consult the Department's Engineering Section for the appropriate information for some elements of the notice, such as the actions consumers should take. The Department also can help you determine what other system-specific information, such as population at risk, should be included in your notice.

**17.2.2 STANDARD LANGUAGE**

- *Language to encourage distribution of the notice to all persons served.*
- You must include the following language in all notices. Use of this language does not relieve you of your obligation to notify all persons served:

“Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.”

- *Health effects language for MCL violations, treatment technique violations, and violations of the conditions of a variance or exemption.* (To be provided by the Department.)
- *Language for monitoring violations (including testing procedure violations).*

You must include the following language for all monitoring and testing procedure violations:

“We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we (did not monitor or test) or (did not complete all monitoring or testing) for [contaminants], and therefore cannot be sure of the quality of your drinking water during that time.”

### **17.2.3 FORMAT OF PUBLIC NOTICE**

All public notices must meet certain formatting standards. These requirements help prevent the notice from being too obscure and to help ensure that consumers can easily read and understand the notice.

Notices must:

1. Be displayed in a conspicuous way when printed or posted;
2. Not contain overly technical language or very small print;
3. Not be formatted in a way that defeats the purpose of the notice; and
4. Not contain language, which nullifies the purpose of the notice.

The Department may have special formatting requirements under certain circumstances. Check to be sure that you meet all the requirements contained in the Notice of Violation provided to you by the Department.

### **17.2.4 NOTICES IN LANGUAGES OTHER THAN ENGLISH**

If your water system serves a large population of non-English speaking consumers, the notice must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the notice or to request assistance in the appropriate language.

You may wish to provide notices in multiple languages if non-English-speaking populations are in your service area, whether or not you have a large proportion of such people. Schools and universities often have students who can translate notices. Make contacts ahead of time with universities, high school teachers, and other services for low-cost translations.

### **17.2.5 NOTIFICATION OF THE DEPARTMENT**

Within 10 days of completing the public notification, you must provide certification of the notice to the Department. Certification includes a copy of each type of notice distributed, published, posted, or made available to customers and the media, and a letter certifying you have met all the public notification requirements.

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## **18 PUBLIC WATER SYSTEM SERVICE FEES**

The Arkansas Department of Health charges fees to public water systems to help pay for the cost of the operation of the Public Water System Supervision Program. These fees allow the Department to collect and analyze most water samples that are required to determine a water system's compliance with the Safe Drinking Water Act regulations. These fees also allow the Department to continue to retain primary enforcement authority for the Safe Drinking Water Act, even though new drinking water regulations are being adopted by the Environmental Protection Agency on at least an annual frequency.

### **18.1 AUTHORITY**

The Public Water System Service fees are authorized by §20-28-101 through §20-28-106 Arkansas Codes Annotated (Act 95 of 1987, as amended.)

### **18.2 FEES**

The fees are set by the Board of Health, with the maximum fee for community public water systems being set at \$0.30 per service connection per month, with a minimum fee of \$250. Non-transient non-community water systems pay at the same rate as community water systems, with the number of service connections being calculated by dividing the number of persons served by 2.5. Transient non-community water systems pay a flat rate fee of \$125, unless exempted by virtue of other fees paid to the Department.

### **18.3 PAYMENT PROCEDURES**

In late May or early June of each year, the Department will mail each community public water system a notice stating the number of service connections shown by the Department's Public Water System Inventory database. The water utility is requested to provide a correct figure if the one cited by the Department is incorrect. The number of service connections is based on the number of connections through which the water utility provides water that is used for domestic purposes (drinking, cooking, restroom facilities). Service connections used only for fire protection or lawn sprinkler systems should not be included.

In July, the Department will invoice each community public water system for the entire amount of the annual fee, equal to \$3.60 multiplied by the number of service connections. If the annual fee exceeds \$1000, the utility may make quarterly payments, starting October 1 of each state fiscal year. If the annual fee exceeds \$5000, the utility may make monthly payments, starting August 1 of each state fiscal year. Annual fees less than \$1000 are due on January 1 of each state fiscal year.

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# 19 Fluoridation and Fluoride Monitoring Requirements

Fluoride, a water soluble form of Fluorine, is a naturally occurring element in water. Over one hundred and fifty (150) public water systems in Arkansas use naturally fluoridated water supplies as their source water. Drinking Water Fluoridation is the process of adjusting the level of Fluoride in drinking water in order to reduce the occurrence of dental caries in a given population. Many Arkansas water systems add Fluoride to their drinking water in order to adjust Fluoride concentrations to optimal levels for the prevention of tooth decay. Fluoride is typically added to drinking water using one of three compounds: Sodium Fluoride, NaF (powder); Sodium Fluorosilicate, Na<sub>2</sub>SiF<sub>6</sub> (powder); and Fluorosilicic Acid, H<sub>2</sub>SiF<sub>6</sub> (liquid).

Fluoride concentrations in drinking water are regulated at the state level under the National Primary and Secondary Drinking Water Regulations. The U.S. Public Health Service has set optimal Fluoride Concentrations for Drinking Water in Arkansas at 0.7 mg/L (ppm), with the optimal range of 0.1 mg/L (ppm) below to 0.5 mg/L (ppm) above the optimal concentration. The Fluoridation of Drinking Water is mandatory for all public water systems serving 5,000 people or more, per Act 197 of 2011. The Fluoridation of Drinking Water for public water systems serving less than 5,000 people is optional. All public water systems in Arkansas that fluoridate must comply with the criteria listed below.

## 19.1 FLUORIDE CONCENTRATIONS

- 19.1.1 Maximum Contaminate Level (MCL) for Fluoride in Drinking Water. The National Primary Drinking Water Regulations set the MCL for Fluoride at 4.0 mg/L (ppm).
- 19.1.2 Secondary Maximum Contaminate Level (SMCL) for Fluoride in Drinking Water. The National Secondary Drinking Water Regulations set the SMCL for Fluoride at 2.0 mg/L (ppm).

## 19.2 CONDUCTING ANALYSES

- 19.2.1 Public Water Systems that adjust Fluoride concentration in their finished water should conduct Fluoride concentration analyses daily and record the results in their Chemical Operating Report (see Illustration 19.2).
- 19.2.2 Analysis Methods
  - 19.2.2.1 Ion Specific Electrode (Electro Analysis): Ion Specific Electro Analysis measures Fluoride ion activity across a Lanthanum Fluoride membrane. A meter records differences in electrical resistance between a standard and the water being analyzed. Ion Specific Electro Analysis can measure Fluoride concentrations from 0.1 to 10 mg/L.
  - 19.2.2.2 Colorimetric using SPADNS (Spectral Analysis): Colorimetric Fluoride Analyses utilize either a Colorimeter or Spectrophotometer to measure differences in light absorption between a standard and the water being analyzed. SPADNS (Sodium 2-(parasulfophenylazo)-1,8-dihydroxy-3,6-naphthene disulfonate) is a reference solution used in determining Fluoride concentration. Spectral Analysis using SPADNS can measure fluoride concentrations from 0.0 to 2.0 mg/L.

## 19.3 MONTHLY SAMPLES

- 19.3.1 Public Water Systems that adjust Fluoride concentration in their finished water should collect monthly samples at the distribution entry point to be analyzed for Fluoride concentration by the Department's Inorganic Chemistry Laboratory.
- 19.3.2 Sampling Procedures:
  - 19.3.2.1 Use only Fluoride Sample Bottles supplied by the Department when submitting monthly samples.
  - 19.3.2.2 Collect the sample at the entry point to the distribution system.
  - 19.3.2.3 The sample should be taken in a clean container sufficient in size to provide a sample quantity

for both field analysis and monthly sample collection. Both the field analysis sample and monthly sample should be collected at the SAME TIME.

19.3.2.4 Analyze the field portion of the collection sample by either method listed in 19.2.2 and record the result in the Water Sample Collection Report for the Inorganic and Radiochemical Laboratory supplied with the sample bottle (see Illustration 19.1).

19.3.2.5 Submit the monthly sample and Water Sample Collection Report to the Department's Inorganic and Radiochemical Laboratory either by courier, mail, or hand delivery. In order to be analyzed, the lab must receive the sample within 28 days from the time of collection.

Illustration 19.1 Water Sample Collection Report

ARKANSAS DEPARTMENT OF HEALTH Bureau of Environmental Health Services Division of Public Health Laboratories Water Sample Collection Report for the Inorganic and Radiochemistry Laboratory				
<b>Bar Code:</b>				
Collection Report #	Note: Sample will not be analyzed unless form is completely filled out			Lab use Only
<b>F</b>	Water System Name		Lab Sample Number	
LOCATION SITE CODE	Sampling Location		Lab Sample Number	
	County	County Code	Submitter Code	Shipped VIA Code
Collected by	Date Collected	Received By	Date Received	
Title	Time Collected	Received From	Collector? <input type="checkbox"/> Yes <input type="checkbox"/> No	Time Received
SAMPLE SPECIMEN	PURPOSE	CATEGORY	Program Area Code <b>E10</b>	Rejection Code
EPT (Entry Point)	CMP (Compliance)	PUB (Public/Community)	Chemistry Code _____ <input type="checkbox"/> Field Preservative <input type="checkbox"/> Label Information <input type="checkbox"/> Quantity Received <input type="checkbox"/> Seal Information <input type="checkbox"/> Container Description <input type="checkbox"/> Condition of Sample	
Resample of Lab# _____	SOURCE		Lab Comments	
	Field Preservative			
	Comments			
Field pH	Field Fluoride	Field Temp	Field Turbidity	Residual Chlorine
<b>Analyses Requested</b>				
Inorganic			Radiochemistry	
<b>Lab Use Only</b>				
[X] Fluoride Only				

NOTE: In the form to the left, Water Systems are only responsible for providing the information requested in the areas shaded in gray: collected by, date collected, title (of collector), time collected, and Field Fluoride. Other report information is completed by the Department and sent to the water system with the sample bottle(s).

Submitting water systems should retain a copy of the completed form for their records.

## 19.4 PUBLIC NOTICE

### 19.4.1 Maximum Contaminant Level (MCL) Exceedance (Tier 2):

19.4.1.1 Water Systems exceeding a Fluoride MCL (see 19.1.1) in any monthly sample must notify every user of the water system of the exceedance as soon as practical but within thirty (30) days after becoming aware of the violation.

- 19.4.1.2 Public notification must reach every user either by hand/direct delivery or by mail.
- 19.4.1.3 For those users not contacted through the initial notice, water systems must notify those users of the violation through alternate methods; i.e., newspapers, e-mail, or community organizations.
- 19.4.1.4 Water Systems exceeding the Fluoride MCL in any monthly sample must repeat public notice every three (3) months as long as the violation persists.
- 19.4.1.5 Water Systems exceeding the Fluoride MCL in any monthly sample must include the violation(s) in the water system's Consumer Confidence Report (CCR).

19.4.2 Secondary Maximum Contaminant Level (SMCL) Exceedance (Tier 3):

- 19.4.2.1 Water Systems exceeding a Fluoride SMCL (see 19.1.2) in any monthly sample must notify every user of the water system as soon as practical but within twelve (12) months after becoming aware of the violation.
- 19.4.2.2 Public notification must reach every user either by hand/direct delivery or by mail.
- 19.4.2.3 For those users not contacted through the initial notice, water systems must notify those users of the violation through alternate methods; i.e., newspapers, e-mail, or community organizations.
- 19.4.2.4 Water Systems exceeding the Fluoride SMCL in any monthly sample must include the violation(s) in the water system's Consumer Confidence Report (CCR).

## 19.5 EMERGENCY PROCEDURES

- 19.5.1 All water systems that adjust Fluoride concentration in their finished water should develop an emergency plan in case of a serious Fluoride overfeed or abnormal concentration.
- 19.5.2 The plan should include coordination with water system operators, the Department, community/city officials, emergency response services, and the press.
- 19.5.3 The plan should be included and posted as part of the water system's Emergency Plan.
- 19.5.4 In the case of a serious overfeed, Fluoride feeders should be shut down immediately and the distribution system flushed until an acceptable level of Fluoride is observed. The overfeed should be reported to the Department as soon as possible.

## 19.6 REPORTING & RECORDKEEPING

- 19.6.1 Public Water Systems that adjust Fluoride concentration in their finished water should record daily in their Chemical Operations Report:
  - 19.6.1.1 Total gallons of water treated,
  - 19.6.1.2 Amount and type of Fluoride Chemical added,
  - 19.6.1.3 And daily Fluoride concentration.
- 19.6.2 Chemical Operations Reports must be submitted to the Department by the tenth (10<sup>th</sup>) of the month following completion.
- 19.6.3 Failure to submit Chemical Operations Reports will result in a Monitoring and Reporting Violation.
- 19.6.4 Chemical Operations Reports must be kept on file by the water system and made available for sanitary surveys for a period not less than ten (10) years.

19.6.5 Unless a longer record retention period is specified elsewhere or required by the National Primary Drinking Water Regulations, all records including analyses results, reports, forms, charts, daily logs, and electronic files shall be retained for a minimum of three (3) years and shall be made available for review if requested.

Illustration 19.2 Chemical Operations Report (Short Form)

**PUBLIC WATER SYSTEM - CHEMICAL TREATMENT RECORD**  
**Arkansas Department of Health - Division of Engineering**

Public Water System Name			ID #	County				Month and Year		
Previous Meter Reading			Chemicals Applied						Residual	
Meter Reading	Date	Thousands of Gallons Treated	Chlorine						Location	MG/L
			Pounds Used	MG/L	Pounds Used	MG/L	Pounds Used	MG/L		
	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									

NOTE: In the form above, empty columns under "Chemicals Applied" may be used for Fluoride addition.

Both the short and long versions of the Chemical Operations Report have columns available for Fluoride addition and are available through the Department.

**ARKANSAS STATE BOARD OF HEALTH**

**DEPARTMENT OF HEALTH  
CENTER FOR LOCAL PUBLIC HEALTH  
ENVIRONMENTAL HEALTH BRANCH  
ENGINEERING SECTION**

**RULES AND REGULATIONS**

**PERTAINING**

**TO**

**PUBLIC WATER SYSTEMS**

Promulgated under the authority of Act 96 of 1913  
and  
Act 8 of the Second Extraordinary Session of 1961, as amended

This Revision Effective February 24, 2014

By the Arkansas State Board of Health

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## **I. AUTHORITY**

### **A. State Authority**

The following Rules and Regulations Pertaining to Public Water Systems are duly adopted and promulgated by the Arkansas State Board of Health pursuant to the authority expressly conferred by the Laws of the State of Arkansas including, without limitation, Act 96 of 1913, as amended (Ark. Code Ann. § 20-7-109).

### **B. Incorporation by Reference**

The Rules and Regulations Pertaining to Public Water Systems incorporate by reference the federal National Primary Drinking Water Regulations found in 40 CFR Parts 141, 142 and 143.

## **II. PURPOSE**

These Rules and Regulations are adopted for the purpose of ensuring that all persons in the State of Arkansas receiving water from a public water system are provided with ample quantities of safe, palatable water which is in full compliance with the National Primary Drinking Water Regulations.

## **III. DEFINITIONS**

For the purpose of these Regulations, the following terms are defined:

### **A. Contaminant:**

Any physical, chemical, biological, or radiological substance or matter in water.

### **B. Cross-Connection:**

A physical connection between a public water supply and either an unsafe or a questionable quality water supply or any toxic or objectionable material.

### **C. Distribution System:**

All systems of conduits and their appurtenances by which water is distributed to consumers.

### **D. Financial Capacity:**

Financial resources of the water system including, but not limited to, the revenue sufficiency, credit worthiness and fiscal controls.

**E. Ground Water:**

Naturally occurring water occupying the zone of saturation in the ground below the surface of the earth.

**F. Managerial Capacity:**

The management structure of the water system including, but not limited to, ownership accountability, staffing, organization and effective linkages.

**G. Maximum Contaminant Level (MCL):**

The maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of a public water system, except in the case of turbidity and other specific contaminants where the maximum permissible level is measured at the point of entry to the distribution system. Contaminants added to the water under circumstances controlled by the user, except for those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition. It is not the intent of these Regulations to include individual service pipes from the property side of the water meter to buildings and plumbing within or in connection with buildings served, since this is covered in the State Plumbing Code.

**H. National Primary Drinking Water Regulations:**

The current, effective drinking water regulations promulgated by the United States Government.

**I. Owner:**

Any person, firm, corporation, institution or governmental agency, or their agent, owning, operating, or modifying any water system, distribution system or water treatment plant.

**J. Public Water Supply Reservoir:**

A lake or reservoir, not owned by the United States of America, which is utilized as a source, directly or indirectly, either permanently, temporarily, or as a standby, for a public water system.

**K. Public Water System:**

Public water system or PWS means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or serves an average of at least twenty-five individuals daily at least 60 days per year. Such term includes: (1) any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and (2) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. This includes sources for bottled water.

**1. Community Public Water System:**

A public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

**2. Non-Community Public Water System:**

A public water system that serves at least 15 service connections or at least 25 persons per day that is not a community water system, or a water source that is not a community water system that is utilized as a source for bottled water.

**a) Non-Transient Non-Community Public Water System:**

A Non-Community Water System that serves at least 25 of the same individuals at least 180 days (or portions thereof) per year.

**b) Transient Non-Community Public Water System:**

Any Non-Community Water System that is not a Non-Transient Non-Community Public Water System.

**L. Restricted intake zone**

An area immediately adjacent to a surface water source intake, in which no activity unrelated to the operation of the intake or water system is permitted.

**M. Restricted buffer zone**

An area, larger than the restricted intake zone, surrounding a surface water intake, a spring, or a wellhead, in which activity is restricted to those activities that will not have the potential to cause contamination of the water source.

**N. Surface Water Influenced Ground Water:**

A ground water with significant occurrence of insects or other macro-organisms, algae, or large diameter pathogens such as *Giardia lamblia*, or which is subject to significant changes in water quality which are determined to be in direct relationship with the climatological or surface water conditions.

**O. Surface Water:**

Water that flows over or rests upon the surface of the earth. The term surface water includes rivers, lakes, impoundments, reservoirs and springs in addition to other man made and naturally occurring bodies of water on the surface of the earth. Thermal springs with minimum water temperatures greater than 120 degrees Fahrenheit are not considered surface water.

Surface water shall not include those springs for which a comprehensive hydrogeologic and microbiologic study has been performed by the owner which indicates a lack of surface water influence, and which has been accepted by the

Department and the Regional Office of the U.S. Environmental Protection Agency, unless additional information refutes the original report's conclusions.

**P. Technical Capacity:**

The physical infrastructure of the water system including, but not limited to, the source water adequacy, infrastructure adequacy (source, treatment, storage, and distribution) and the ability of system personnel to implement the requisite technical knowledge.

**Q. Water Treatment Plant:**

A group or assemblage of processes, devices, and structures used for treating or conditioning water for public drinking or domestic purposes.

**R. Water Operator**

Any person who during the performance of their regular duties, at any community public water system; any non-transient non-community public water system; or any transient non-community public water system that utilizes a surface water or surface water influenced source, exercises individual judgment, whether directly or indirectly, that might affect the safety, quality, or quantity of water delivered from the water system. (The term Operator generally includes, but is not limited to, Managers, Assistant Managers, Superintendents, Assistant Superintendents, Construction and Maintenance Foremen, treatment plant personnel and other persons responsible for the operation and maintenance of wells, reservoirs, water treatment facilities, water distribution facilities, and pumping facilities.)

**S. Water Operator of Record:**

That person, not including elected officials performing their duties of office, whose primary responsibility is the highest level of management and/or operation of the water system, and compliance with the relevant state and federal drinking water regulations.

**T. Water Operator(s) in Responsible Charge**

The water operator(s) designated by the owner to be the licensed operator(s) who is in direct supervision of the water system regarding the daily operational activities and protocols that an operator(s) follows when operating a public water system, water treatment facility and/or distribution facility.

#### **IV. APPLICABILITY**

These Rules and Regulations apply to all public water systems in the State of Arkansas, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year, including federally owned or maintained public water systems. These Rules & Regulations shall also apply to owners and their agents who plan, design, or construct modifications or additions to public water systems.

These Rules and Regulations shall apply to all public water systems utilized as a source for bottled water without regard to population served.

## **V. WATER QUALITY**

### **A. Drinking Water Standards**

The quality of the water made available must conform to the National Primary Drinking Water Regulations. The Arkansas Department of Health may require the quality of the water to conform to the National Secondary Drinking Water Regulations.

### **B. Approval**

The quality of new or additional sources of supply must be approved by the Arkansas Department of Health before being made available for public use. Production of water that poses no threat to the consumer's health depends on continuous protection. Because of human frailties associated with protection, priority should be given to selection of the purest source. Polluted sources should not be used unless other sources are not feasible and then only when adequate personnel, equipment, and operating procedures are proposed or in-place to purify and otherwise continuously protect the drinking water supply.

## **VI. ALTERATIONS OR CHANGES REQUIRED**

### **A. Authority to Issue Orders**

The Arkansas Department of Health may, in order to protect the public health and to ensure compliance with these and other applicable regulations, issue orders to public water systems requiring any one or more of the following actions:

1. The securing of a new source;
2. The modification of treatment facilities;
3. The addition of treatment facilities;
4. The securing of new or additional testing equipment;
5. The modification or expansion of monitoring or operating procedures;
6. The updating and submission to the Arkansas Department of Health of the system's long range plan, or the submission of other financial or technical reports requested by the Department, to document the system's technical, financial, and managerial capacity to comply with the requirements of the Safe Drinking Water Act.

7. The conducting of a Comprehensive Performance Evaluation on the system in accordance with the protocols established by the Environmental Protection Agency.

## **B. Provision of Emergency Water Supply**

Upon determination by the Director of the Arkansas Department of Health that a public health emergency exists, the Arkansas Department of Health may order a public water system to provide water to another public water system for the duration of the emergency, provided that the receiving public water system agrees to pay a reasonable rate for the water provided. The Department of Health must make a formal determination that the supplying system has excess capacity, and that the supplying system will not be harmed by the Order.

## **C. Compliance with Arkansas Department of Health Orders**

The person, firm, corporation, institution, governmental agency, or municipality owning a public water system, shall, at its own expense, comply with such orders in a reasonable length of time. Approval of any proposed change or new construction, by the Arkansas Department of Health, is required prior to initiating the change or the new construction.

# **VII. OPERATION**

Every owner must operate the water supply, including water treatment plant and distribution system, so as to meet the standards set forth in the National Primary Drinking Water Regulations, and take every reasonable precaution to protect the water from contamination. Every owner of a surface water system must operate the treatment facility within the operating criteria specified at the time of approval by the Arkansas Department of Health, or as specified in writing to the owner by the Arkansas Department of Health at any time following the approval. (See also Section XXI.)

## **A. Monitoring**

For purposes of determining compliance with the National Drinking Water Regulations, the Arkansas Department of Health Laboratory will be used unless otherwise approved by the Arkansas Department of Health.

The Arkansas Department of Health may, by using a published policy, signed by the Director of the Department, and approved by the U.S. Environmental Protection Agency, utilize any discretion allowed in the National Primary Drinking Water Regulations for monitoring requirements or for Maximum Contaminant Level or Treatment Technique compliance.

## **B. Records**

The owner shall make such suitable analyses and keep such records of operation as required by the Arkansas Department of Health. True and accurate reports of such analyses and operational records for each month shall be submitted to the Arkansas Department of Health by the tenth day of the following month. (See also Section XVII.)

Unless a longer record retention period is specified elsewhere or required by the National Primary Drinking Water Regulations, all records including analyses results, reports, forms, charts, daily logs, and electronic files shall be retained for a minimum of three (3) years and shall be made available for review if requested.

## **C. Responsibility**

Every owner or their agents shall be responsible for compliance with these Regulations and shall submit samples of water to the Arkansas Department of Health Laboratory whenever requested by the Arkansas Department of Health. Such samples must be representative of the water in the system and must not be tampered with in any manner which may affect the analytical results.

## **D. License**

The owner of any community public water system, non-transient non-community public water system, or any other non-community public water system which utilizes a surface water or surface water influenced source shall utilize water operators duly licensed under the provisions of Act 333 of 1957, as amended, and such Rules and Regulations as may be adopted under the provisions of Act 333 of 1957 as amended. (See Arkansas Code Annotated § 17-51-101 et seq )

The owner shall place the direct supervision of the water system under an available Water Operator(s) in Responsible Charge holding a valid license equal to or greater than the classification of the treatment facility and/or distribution facility.

## **E. Cross-Connection Program**

The owner shall institute a routine cross-connection program to locate and eliminate cross-connections. The program shall include routine inspections of commercial and industrial establishments and the routine maintenance of a listing of locations of cross-connection control devices. Each program shall include the mandatory testing of backflow prevention devices by certified testers, on a frequency approved by the Arkansas Department of Health.

## **F. Fluoridation**

### **1. Application**

In accordance with Act 197 of 2011 (§ 20-7-136) , the owner of a public water system

that produces and treats raw water and that directly or through a consecutive system or systems supplies five thousand (5,000) persons or more shall implement a fluoridation program so as to maintain an optimum fluoride concentration in the water. For such systems and for any public water system that controls the fluoride concentration, the optimum concentration shall be 0.7 milligrams per liter with a control range of 0.6 milligrams per liter to 1.2 milligrams per liter.

## 2. Equipment, testing and reporting

A public water system that controls the fluoride concentration shall comply with the applicable sections of this regulation. In addition, such public water systems shall comply with the fluoride equipment, record keeping, testing, reporting and related requirements identified as a “must” for Community Public Water Systems contained in Sections II, III, and IV of *Engineering and Administrative Recommendations for Water Fluoridation*, 1995, Centers for Disease Control and Prevention, except that entry point rather than distribution system monitoring shall be utilized for measuring the fluoride concentration. Other exceptions on a case-by-case basis may be allowed but only as specified in writing by the Arkansas Department of Health.

## 3. Compliance

Pursuant to § 20-7-136 (d) and (e), implementation of a fluoridation program is not required: 1) until funds sufficient to pay capital start-up costs for fluoridation equipment for the system have become available from any source other than tax revenue or service revenue collected by the water system or the entity which owns or controls it; or 2) for a water system in this state that receives its water from a community in another state until a substantially similar fluoridation program is enacted in the other state. Reasonable items for fluoridation start-up include those indispensable to the proper and safe addition and handling of fluoride compounds such as piping, feeder, chemical storage, safety, testing and related equipment and facilities.

## **G. Approved Chemicals, Materials, Equipment, and Processes**

All chemicals added to the water and all materials in contact with in-process or treated water shall be certified as being in compliance with ANSI/NSF Standards 60 and 61, as applicable. In addition, all products required to be “lead free” as determined through Section 1417 of the Safe Drinking Water Act (42 U.S.C. 300g-6) shall be certified as being in compliance with NSF/ANSI 372 or Annex G of NSF/ANSI 61. Certification shall be made by an independent agency. Self-certification by the manufacturer will not be accepted.

All unit processes, equipment, chemicals and appurtenances shall be in accordance with the latest edition of the applicable AWWA standards, and approved by the Arkansas Department of Health.

For treatment facilities utilized for treating water solely for bottled water, at its discretion, the Department may allow certification with the equivalent U.S. Food and Drug Administration food contact or food additive standard in lieu of certification with the appropriate ANSI/NSF 60/61 and AWWA standards.

## **H. Emergency Planning**

Each Community Public Water System and each Non-Transient Non-Community Public Water System shall have a written emergency plan. The emergency plan shall include, at a minimum, names and telephone numbers of responsible utility personnel, procedures to be followed in the event of loss of electricity, source, treatment, storage, or distribution facilities, and procedures to be followed in the event of a loss of distribution system pressure or a known or suspected introduction of contaminants into the distribution system, as approved by the Arkansas Department of Health.

## **I. Long Range Planning**

Each Community Public Water System and each Non-Transient Non-Community Public water system shall have a written long-range plan. The long-range plan shall address, at a minimum, projected needs for source, treatment, storage and distribution for a planning period of at least ten years, and shall demonstrate the system's technical, financial, and managerial capacity to comply with the requirements of the Safe Drinking Water Act.

## **J. New Systems/Modification of Existing Systems**

Prior to the startup of a new public water system or specified extensions or modifications of existing systems, the Owner shall notify the Department of Health that the system is in full compliance with the approved plans, specifications, and special conditions imposed by the Department, and obtain written approval from the Department to initiate use of the new system or modifications. The Department shall issue written approval or disapproval within five working days of the receipt of the certification. If the Department fails to issue an approval or disapproval within five working days following the Department's receipt of the certification, use of the project may be initiated. The Department may grant verbal interim approvals in emergency or critical situations.

# **VIII. GROUND WATER SUPPLIES**

## **A. Location**

### **1. Surface Drainage**

Every well must be located on a site having good surface drainage, at a higher elevation than, and at a safe distance from, any barnyard, privy, soil pipe, any pipe through which sewage may back up or overflow or from any other possible source of pollution and in such a manner as to prevent the contamination of the

water by either underground seepage or channels, lakes, ponds and surface drainage.

## **2. Proximity to Sources of Contamination**

The horizontal distance from any such possible source of contamination such as privies, septic tanks, sewers, sub-surface pits, sub-surface sewage disposal fields, and barnyards must not be less than 100 feet. This distance shall be used only where a sanitary survey performed by the Arkansas Department of Health indicates it to be safe, and greater distances shall be required where local conditions necessitate. Chemical storage or disposal facilities shall not be located within 100 feet of the well, without written approval of the Arkansas Department of Health.

## **3. Proposed Well Sites**

The location of each proposed well must be approved in writing by the Arkansas Department of Health prior to commencing construction.

## **4. Location Below Grade Prohibited**

No wellhead, well casing or well pump (except submersible pumps) shall be located in any pit, room or spaces extending below ground directly over the well.

## **5. Ownership of Restricted Buffer (Wellhead Protection) Zone**

The owners of water supplies utilizing a well source shall effectively control a restricted buffer (wellhead protection) zone around the well at 100 feet in radius. Deviation from ownership of the restricted buffer (wellhead protection) zone may be approved by the Arkansas Department of Health for a portion of the restricted buffer (wellhead protection) zone when that portion is owned by another entity and permanent protective easements approved by the Department of Health prohibit the conveyance, use, or storage of potential contaminants within the easement.

## **B. Well Construction**

All public water wells, whether community or non-community, shall be constructed in accordance with the latest edition of AWWA Standard A100 and approved by the Arkansas Department of Health. A copy of the well construction log shall be filed with the Arkansas Department of Health.

## **1. Casing**

Every well must have an outside water tight casing extending below the ground surface to such a depth as may be necessary, depending upon the character of the underground formations, to exclude the entrance of undesirable water and sub-surface contamination, as determined by the Arkansas Department of Health. The outer casing should be seated securely into an impervious formation whenever possible, otherwise the casing should extend as far as practical below the water table. The casing, when it extends into a pump room, shall project above the pump room floor, and safely above maximum flood elevation.

The annular space between the excavation line and the outside of the casing shall be filled with impervious cement grout in such a manner as to prevent surface water or shallow ground water from running directly down the outside of the casing. The required depth of the grout seal will be determined by the Arkansas Department of Health after a review of the geological formation.

## **2. Surface Protection**

When required, the well must be protected at the surface by a water tight slab or platform extending a minimum of two feet in all directions from the well and sloped to provide drainage away from the well.

## **3. Wellhead and Pump**

The discharge tee of the pump, together with the valves, shall be above the pump room floor. Any pump placed immediately over the well casing must have a watertight metal base to form a cover for the well. The base plate of the pump shall be recessed on the under side to permit the casing to extend into it at least one inch above the level of the concrete foundation. All air-relief vent openings must be at least 24 inches above the floor and must be screened and protected against the possibility of contaminating material entering the vent. Each wellhead shall be provided with a raw water sample tap and the means for measuring drawdown. Exceptions to this may be allowed for pitless adapters provided they conform with all requirements of the latest edition of "Recommended Standards for Waterworks" by the Great Lakes – Upper Mississippi river Board of State Sanitary Engineers (Ten States Standards).

## **4. Abandonment of Wells**

All abandoned wells in consolidated formations must be filled from bottom to within two feet of the top with cement. All wells in unconsolidated formations must be filled with sand or natural material from the bottom to twelve (12) feet

from the ground surface, and with bentonite or cement from twelve (12) feet to two (2) feet from the ground surface. The record of abandonment must be filed with the Arkansas Department of Health. See "Arkansas Water Well Construction Code" - Arkansas Water Well Construction Commission - for more detailed information on requirements.

### **C. Raw Water Quality**

The raw water at the wellhead shall not contain organic, inorganic or radiochemical contaminants that would not be removed or reduced to acceptable levels by a reasonable method of water treatment.

## **IX. SURFACE WATER SUPPLIES**

### **A. Raw Water Quality**

The water at the intake, based on the monthly arithmetical average number of coliform organisms, shall not exceed 5,000 per 100 ml. in any month; nor exceed this number in more than 20 percent of the samples examined during any month; nor exceed 20,000 per 100 ml. in more than 5 percent of such samples.

The water at the intake shall not contain organic, inorganic, or radiochemical contaminants that would not be removed or reduced to acceptable levels by a reasonable method of water treatment.

### **B. Watershed and Reservoir Sanitation**

Protective distances stated in this section are minimum distances that may be used only under ideal circumstances. Greater protection will be required in most cases; the extent of the protective area will be determined by a field inspection of the proposed site by the staff of the Department.

#### **1. Recreational Use**

Artificial lakes and all other bodies of water serving as reservoirs for city or other public water supplies shall not be used for recreational or other purposes in a manner whereby the water supply might become contaminated and thus become a potential hazard to public health. (Also see Ark. Code Ann. § 14-234-405 and Ark. Code Ann. § 14-251-106.)

#### **2. Water Intake Structures**

Intake structures shall be located and designed such that the best possible water quality can be obtained. Multi-level intake ports shall be provided.

Buoys shall be located in the water supply reservoir at a minimum distance of 300 feet from the intake and the use of the water or land within this 300 foot zone shall be restricted to water supply activity only (restricted intake zone). Greater distances may be required when deemed necessary by the Arkansas Department of Health.

### **3. Ownership of Restricted Zones**

#### **a) River Sources**

The owners of water systems utilizing river intakes shall own and effectively control a restricted buffer zone around the water intake. The minimum restricted buffer zone shall include all land from the riverbank to a line 300 feet back, if within a one fourth mile radius of the intake. The maximum extent of this zone will be determined by the Arkansas Department of Health on an individual basis after a sanitary survey of the intake site has been made.

The Department may reduce the downstream protected zone if a weir or other physical barrier precludes downstream water from backing up to the intake.

#### **b) Public Water Supply Reservoirs**

The owners of water systems shall own and effectively control a restricted buffer zone around the reservoir. The restricted buffer zone shall include all of the land bounded by a fixed line which is at least 300 feet horizontally from the shore line when the reservoir is at the maximum high water level contour as established by the Arkansas Department of Health. Use of the restricted buffer zone will be determined by the Arkansas Department of Health.

#### **c) Other Reservoir Sources**

In the case of large multi- purpose reservoirs developed, owned and operated by the federal government, the water system owner shall effectively control a restricted buffer zone on land around the water intake structure. The extent of this restricted buffer zone will be determined on an individual basis by the Arkansas Department of Health after a sanitary survey of the proposed intake site has been made. All possible sources of contamination are prohibited within this restricted buffer zone.

**d) Spring Sources**

The owners of water supplies utilizing spring sources shall own and effectively control a restricted buffer zone around the spring. The minimum restricted buffer zone shall be all property with a 300 foot radius of the spring enclosure. The maximum extent of this buffer zone will be determined by the Arkansas Department of Health on an individual basis after a sanitary survey has been made of the spring site.

**4. Deviations from the Restricted Buffer Zone**

Deviations from the minimum restricted buffer zone may be approved by the Arkansas Department of Health for a portion of the restricted buffer zone when that portion is owned by another governmental entity and protective easements to prohibit the conveyance, use, or storage of potential contaminants within the easement are granted to the public water system.

**5. Pollution of the Watershed**

**a) Objectionable Substances**

No sewage, garbage, dead animals, refuse, industrial wastes or other objectionable substances shall be deposited in the reservoir, or in the restricted zones of any surface water source or surface water influenced ground water source.

None of the above substances may be deposited, discharged, or disposed of within the watershed of the water source, without the written approval of Arkansas Department of Health.

**b) Domestic Animals**

Horses, cows, sheep, goats, swine, fowl, or other domestic animals are prohibited in the restricted zones. Domestic animal lots and pens located on the watershed of a water supply shall be maintained in a manner acceptable to the Arkansas Department of Health.

**c) Human Habitation**

Residences, dwellings, houses, cottages, camps, cabins, tents, trailers, club houses, or other places where people reside, congregate, or are employed are prohibited in the restricted buffer zone around the

reservoir; provided, however, that the water utility may, upon approval by the Arkansas Department of Health, construct such structures in the restricted buffer zone that are necessary for the protection of the reservoir. All sewage disposal facilities located on the watershed of the reservoir shall be constructed and maintained in accordance with the requirements of the Arkansas Department of Health.

**d) Picnicking and Camping**

Camping is prohibited in the restricted buffer zone of the water supply. Picnicking is prohibited in the restricted intake zone.

**e) Swimming, Bathing, Skiing**

Swimming, bathing, or skiing in the restricted intake zone of the water supply, or other zones as specified by the Arkansas Department of Health, is prohibited.

**C. Filtration Required**

**1. Approval Required**

Filtration of all surface water sources and surface water influenced groundwater sources, by a method approved by the Arkansas Department of Health, is required.

**2. Use of Discretion**

The Arkansas Department of Health may, by using a published policy, signed by the Director of the Department and approved by the U.S. Environmental Protection Agency, utilize discretion allowed in the National Primary Drinking Water Regulations to allow an alternate MCL for turbidity.

**D. Determination of Level of Treatment Required**

The Arkansas Department of Health shall:

Set the level of removal/inactivation for enteric cysts and viruses (logarithmic removal rates) required for each surface water source and each surface water influenced groundwater source.

Determine treatment plant efficiency for removal of enteric cysts and viruses.

Determine the contact time or other operational parameter associated with each treatment plant and its equipment, based on information submitted by the owner or established by the staff of the Arkansas Department of Health, for

assigning the level of inactivation of enteric cysts and viruses provided by the disinfection system.

Determine if each ground water source utilized by a public water system is surface water influenced.

## **X. WATER TREATMENT PLANTS**

### **A. Location**

Plants shall be located on sites having good drainage and not subject to flooding. They shall also be located so that no conduit, basin or other structure containing or conducting water in the process of treatment can possibly be affected by leakage from any sewer, drain or other source of contamination.

### **B. Chemical Feed and Dosing**

Adequate quantities of suitable chemicals shall be provided as required for the approved treatment processes. All chemical feed machines shall be kept in good repair and accurately adjusted so that proper and efficient dosage of chemicals can be maintained at all times. Proper safety equipment shall be provided, and safety procedures followed, where chemicals are used or stored.

### **C. Mixing and Flocculation**

Facilities shall be designed and operated to insure adequate mixing of chemicals with the untreated water and to maximize particle formation. All mixing devices shall be maintained in good repair so as to provide efficient mixing of the chemicals.

### **D. Sedimentation Basins**

Sedimentation basins shall be designed and operated so as to maximize particulate removal. Sedimentation basins shall be cleaned as often as necessary so as to reduce algal growth and minimize taste and odors in the settled water.

### **E. Filters**

Filters shall be designed and operated so as to maximize contaminant removal. Filters shall be inspected periodically and kept in good operating condition. All valves, controls, and regulators shall be maintained in good working order. The rate of backwash shall be sufficient to rid the filter of all accumulations. Filter-to-waste facilities are required.

## **F. Disinfection Equipment**

All disinfection equipment shall be maintained in good working condition. All leaks shall be corrected immediately. Ammonia or other suitable leak indicators shall be kept on hand at all times and shall be used for the determination of leaks. Disinfection equipment shall be kept clean and free from deposits so as to not impede the feed or regulating devices. Adequate heating, safety equipment, spare parts, and ventilation facilities shall be provided.

## **G. Laboratory**

Adequate laboratory facilities suitable for the control of the treatment processes involved shall be provided and shall be certified by the Arkansas Department of Health, if necessary.

## **H. Plant Maintenance**

All treatment plants shall be kept and maintained in a clean and sanitary manner. All accumulations of trash, chemical bags, cans, etc., shall be removed from the premises daily. Surrounding grounds shall be maintained in a suitable manner.

# **XI. POTABLE WATER STORAGE TANKS**

## **A. Location**

Potable water storage tanks shall be located above ground water level unless otherwise approved in writing by the Arkansas Department of Health. The location must be such that surface water and underground drainage will be away from the structure. They shall not be placed in close proximity to any sewer, privy, septic tank, absorption field or other source of pollution from which either surface or underground drainage might flow toward the storage tank. The minimum distances from any sources of pollution shall be in accordance with Section VIII. A. Any sewer located within 100 feet of any storage tank that has a portion which is located below grade should be constructed with water-tight mechanical joints.

## **B. Drainage**

All potable water storage tanks shall be protected against flooding. The ground surface shall be sloped to drain or divert surface water away from the storage tank and shall be so graded that no surface water will pool within the vicinity of the storage tank. Floors of passageways, galleries or compartments adjacent to any potable water storage tank shall have free drainage to the surface of the ground or into a

drainage pit equipped with proper drainage pumps of ample capacity which are properly maintained.

### **C. Overflows**

Overflow pipes shall discharge freely at least 12 inches above ground or flood level or into an open basin from a point not less than 12 inches above the top of spill line of the basin. They shall be protected against backflow. The overflow outlet shall be turned downward or to the side, and protected to prevent the entrance of rain, dust, birds, insects, rodents, or other contaminating material.

### **D. Design and Operation**

Sufficient useable storage shall be provided with consideration given to average daily demand, peak hourly demand, power outages, and fire flows, if applicable. Particular care shall be taken to insure that construction joints are water tight and free of any material likely to deteriorate or fail due to weathering. Storage tanks shall be kept free from cracks. All inlet and outlet pipes shall be properly supported and shall be provided with a flexible joint, or equal, to prevent cracking the pipe if unequal settlement should occur. Wall castings shall be provided with suitable collars to insure watertight connections.

All potable water storage tanks shall be designed, inspected, repaired, and painted in accordance with the latest edition of the applicable AWWA standards. A routine maintenance program, including regular cleaning and painting, shall be applied to all potable water storage tanks. All leaks shall be promptly repaired.

### **E. Covers**

Suitable and substantial covers shall be provided for all potable water storage tanks. They shall be water tight and of some permanent material and shall be constructed so as to provide drainage away from the cover and to prevent the entrance of contamination. The surface of covers shall not be used for any purpose in connection with which contamination material is likely to be produced.

### **F. Manholes**

Manhole openings shall be fitted with raised water tight walls projecting at least 4 inches above the surrounding surface, with a solid water tight cover with edges projecting downward at least 2 inches around the outside frame, or be fitted with a gasketed, weather tight cover. The manhole covers shall be provided with a sturdy locking device and should be kept locked at all times except when actually in use.

### **G. Vents and Other Openings**

Any necessary vents or opening through covers of storage tanks for water level control gauges or other purposes shall be constructed so as to prevent the entrance of

dust, rain, bird, insects and any other material that might include contamination. Any such opening shall be provided with a pipe sleeve or other device making a watertight junction with the storage tank cover and extending without openings to at least 12 inches above the surface of the cover with a stuffing box at the top. No such vents or openings shall be provided near sources of dust, smoke and the like nor where surface water might splash into them. Vents must be protected with a 24-mesh screen.

## **H. Cleaning and Disinfection**

Potable water storage tanks shall be cleaned as often as necessary. They shall be effectively disinfected before being placed into service in accordance with the "American Water Works Association Standard for Disinfection of Water Storage Facilities" (the latest edition of AWWA C652-92 or the latest revision thereof). Before the storage tank is placed in service, two consecutive series of samples that are not collected on the same day must show that the water is bacteriologically safe for drinking purposes.

## **XII. DISINFECTION REQUIRED**

Disinfection of all public water supplies by a method approved by the Arkansas Department of Health must be provided. Disinfection must include adequate contact holding time prior to pumping into the distribution and storage system. An adequate residual of the disinfectant must be carried to all points throughout the distribution system.

## **XIII. BOOSTER PUMP STATIONS**

Booster pump stations shall be located on sites having good surface drainage and not subject to flooding. When the pump suction lines are connected to the distribution system, they must be automatically controlled so as not to reduce the suction line pressure to less than 20 pounds per square inch. The suction line on any booster pump shall be so located and constructed to prevent contamination of the water supply.

## **XIV. DISTRIBUTION SYSTEM**

All public water supply distribution systems shall be tested and constructed using materials and construction methods in accordance with the latest edition of the applicable AWWA standards and approved by the Arkansas Department of Health.

## **A. Sanitary and Safety Hazards.**

The operating routine shall include necessary protective measures to detect and remove or destroy any contaminant of concern or regulation that might enter the distribution system. Every precaution must be taken against the possibility of sewage contamination of the water in the distribution system. Water mains and sanitary sewers shall be constructed as far apart as practicable, and shall be separated by undisturbed and compacted earth. A minimum horizontal distance of ten feet should be maintained between water lines and sewer lines or other sources of contamination. Water lines and sewers shall not be laid in the same trench except on the written approval of the Arkansas Department of Health. Water mains necessarily in close proximity to sewers must be placed so that the bottom of the water line will be at least 18 inches above the top of the sewer line at its highest point. If this distance must unavoidably be reduced, the water line or the sewer line must be encased in watertight pipe with sealed watertight ends extending at least ten feet either side of the crossing. Any joint in the encasement pipe is to be mechanically restrained. The encasement pipe may be vented to the surface if carrying water or sewer under pressure. Where a water line must unavoidably pass beneath the sewer line, at least 18 inches of separation must be maintained between the outside of the two pipes in addition to the preceding encasement requirement. Exceptions to this must be approved in writing by the Arkansas Department of Health

A minimum horizontal distance of three feet shall be maintained between water lines and other underground utilities of a nonsanitary nature (gas, electric, etc.). Exceptions to this must be approved in writing by the Arkansas Department of Health and Human Services.

## **B. System Design**

### **1. General**

The distribution system shall be properly arranged and of ample capacity to insure a supply of water to all parts of the system to meet any reasonable demand, including fire, if applicable, without producing a condition of negative pressure in any part of the system. A minimum pressure of 20 pounds per square inch shall be maintained, except under emergency conditions such as a fire flow or main break. Pipes shall have sufficient structural strength and shall be properly supported and reinforced where necessary to guard against structural failures and resulting sanitary hazards. All drains, such as hydrant drips or valve pits, shall discharge onto the ground surface where possible, or into dry pits or gravel pockets, but not into any sewer.

### **2. Location Records**

An accurate up-date record shall be kept of the location of every item in the distribution system with all mains, valves and other underground structures

carefully referenced to reasonably permanent aboveground objects in order that the underground structure may be properly located. Such records should show all pipes carrying domestic sewage or toxic industrial wastes located within 10 feet of any element of the distribution system.

### **3. Depth of Mains**

All water pipes must be located at sufficient depth to protect the pipe from the direct effect of traffic and at least below maximum frost depth of the locality, or be otherwise protected.

### **4. Valves**

Valves shall be located at frequent intervals along all water mains and at such points to permit closing off of any section of a water main for repairs or testing without affecting water service to any extended area. All valves shall be tested for leakage and operation by routine inspection at frequent intervals. Leaky stuffing boxes shall be properly and promptly repaired.

### **5. Blowoff Drainage**

Blowoffs shall be so located that the distribution system may be properly flushed, and so that danger of contamination of the water line by backflow will be eliminated. No blowoff shall be connected to any sewer or storm drain, submerged in any surface water or installed in any manner that will permit backsiphonage into the distribution system. The discharge of the blowoff shall be located above natural grade, and be screened, capped, or plugged.

## **C. Water Main Construction**

Construction shall be carried out so as to insure a water distribution system free from leaks, thoroughly supported to prevent settlement or breakage of pipes and thoroughly sterilized to remove all possibility of infection or contamination. Particular care must be taken to guard against the entrance of sewage into the trench during or after construction. Any sewage matter that might be found in the trench shall be carefully removed and the location sterilized with a suitable chlorine compound spread over the area. Ample provision must be made to remove all ground or surface water from the trenches and no such water shall be allowed to enter the pipe. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times. They shall be carefully inspected and thoroughly cleaned before laying. After laying and before completion of backfill, lines shall be tested in accordance with the latest edition of the applicable AWWA specifications for the pipe material being used.

## **D. Used Pipe**

The use of secondhand or used pipe is prohibited unless it was previously used for the distribution of potable water, or approved by the Arkansas Department of Health.

## **E. Disinfection of Pipe**

Before being placed in service, all new water distribution systems, extensions to existing systems, any valved section of such extension or any replacement of the water distribution system shall be properly disinfected. Prior to disinfection, all dirt shall be removed by thorough flushing. All valves and appurtenances affected shall be operated while the pipeline is filled with the disinfecting agent. Following disinfection, all treated water shall be thoroughly flushed from the pipeline and bacteriological samples shall be taken to determine the efficiency of the disinfection procedure. Before the system or line is placed in service, two consecutive series of samples that are not collected on the same day must show that the water is bacteriologically safe for drinking purposes. Disinfection shall conform with American Water Works Association, "Standard Specifications for Disinfecting Water Mains," C651-92, or the latest revision thereof.

## **F. Plumbing Inspection and Sewage Disposal Required**

### **1. Approved Sewage Disposal Required**

No public water system shall provide service to a new building or residence in an unsewered area until the customer provides written documentation that the Department of Health has approved plans for construction of a sewage disposal facility for the building or residence, or that no disposal system approval is required by the Department of Health for the building.

### **2. Plumbing Inspection Required**

No public water system shall provide new service to any building or residence until the customer provides written documentation that the service line and building plumbing were inspected by the system's certified plumbing inspector, and found to be in substantial compliance with the State Plumbing Code (Rules and Regulations Governing Construction, Installation, and Inspection of Plumbing and Drainage).

#### **a) No System Plumbing Inspector**

If the system has no certified plumbing inspector, the written documentation shall be obtained from the Department of Health's Area Plumbing Inspector or a certified inspector designated by the Area Inspector.

**b) Temporary Construction Service**

Temporary service for construction purposes, in unsewered areas, may be provided only after compliance with Section XIV. F. 1, above.

**XV. RETURN OF COOLING WATER**

The return of heating or cooling water to a potable water storage reservoir or distribution system is prohibited.

**XVI. CROSS CONNECTIONS**

Any physical connection is prohibited whereby a public water system whether community or non-community, is connected to an unsafe or questionable water supply system either inside or outside of any building or buildings.

**A. Prohibited Services**

Domestic water shall not be supplied to any device, equipment, or service connection which may permit the contamination of the water supply by backsiphonage or backflow. Provision of water service to any service connection found to contain a cross-connection shall immediately be terminated, unless a backflow prevention device of a type approved by the Arkansas Department of Health is installed between the cross-connection and the public water system.

**XVII. NOTIFICATION**

**A. Notification of Arkansas Department of Health**

The owner shall report to the Arkansas Department of Health within the 48 hour time limit prescribed by the Arkansas Department of Health the failure to comply with any primary drinking water regulation including failure to comply with monitoring requirements. The owner is not required to report analytical results to the Arkansas Department of Health in cases where the analysis was performed by the Arkansas Department of Health Laboratory.

The owner shall report to the Arkansas Department of Health within four hours of the discovery and evaluation of any emergency condition located in the water system which affects the ability of the water system to deliver adequate quantities of safe water to its customers. Examples of such emergencies include loss of pressure in the distribution system, failure of the source or treatment facility or parts thereof, voluntary

or mandatory water conservation efforts, or the known or suspected introduction of any contaminant into the water system.

The owner shall report to the Arkansas Department of Health, within two working days, of any change of the Operator of Record for the water system. The owner shall report both the names of the former Operator of Record and the new Operator of Record.

## **B. Notification of the Public**

The owner shall, as directed in writing by the Arkansas Department of Health or as required by the National Primary Drinking Water Regulations, notify the public of its failure to comply with the National Primary Drinking Water Regulations, and/or its failure to comply with these regulations, or of any emergency condition. Public notification shall be given using the wording directed by the Arkansas Department of Health. The public notification shall be given in a timely manner as directed by the Arkansas Department of Health.

In lieu of applying specific National Primary Drinking Water Regulations public notification requirements to bottled water, the Engineering Section shall notify the water bottler and the appropriate state regulatory program when the Department has determined that there has been a failure of the bottled water source to comply with the monitoring, Maximum Contaminant Level, or Treatment Technique requirements of the National Primary Drinking Water Regulations, as applied Non-Transient Non-Community Public Water Systems.

## **XVIII. APPROVED LABORATORIES**

The Arkansas Department of Health Laboratory shall conduct analyses for the purpose of determining compliance with the National Primary Drinking Water Regulations. Routine examinations on a daily, weekly, or monthly basis may be conducted in a public water system plant laboratory certified by the Arkansas Department of Health.

## **XIX. VARIANCES AND EXEMPTIONS**

A review of chemical and physical analyses for public water systems in the State of Arkansas indicates that a program of variances and exemptions is not needed by the State. If the need arises, the Arkansas Department of Health is authorized to implement a program of variances and exemptions consistent with the requirements of the National Primary Drinking Water Regulations.

## **XX. PRELIMINARY REPORTS**

Before detailed plans and specifications are prepared for the construction of new public water systems or major improvements to existing public water systems are prepared, the owner or his authorized agent shall submit to the Arkansas Department of Health a preliminary report containing data and information sufficient for the complete understanding of the proposed work. The "Recommended Standards for Waterworks" by the Great Lakes - Upper Mississippi River Board of State Sanitary Engineers (Ten States Standards) is recommended as a guide. An inspection by Arkansas Department of Health staff of all proposed surface water and all groundwater source locations shall be conducted as part of the review of the preliminary report.

For proposed new Community Public Water Systems and Non-Transient Non-Community Public Water Systems, the preliminary report shall include sufficient information to demonstrate the system's technical, financial, and managerial capacity to comply with the requirements of the Safe Drinking Water Act (See Section VII. H.). The Department shall not approve the construction of any new Community Public Water System or Non-Transient Non-Community Public Water System unless the Department formally concurs that the report demonstrates the system's technical, financial, and managerial capacity to comply with the requirements of the Safe Drinking Water Act.

## **XXI. SUBMISSION OF PLANS AND SPECIFICATIONS**

### **A. Submission of Plans**

The owner or his authorized agent shall submit two complete sets of engineering plans and specifications to, and receive written approval of, the Arkansas Department of Health, before constructing or entering into a contract to construct a water supply system, source of supply, water purification plant and/or distribution system, or any alterations thereto. Thereafter such engineering plans and specifications must be adhered to unless deviations are submitted to, and receive written approval of, the Arkansas Department of Health. The Arkansas Department of Health may, upon approval of a written agreement between the owner and the Arkansas Department of Health, delegate plan review responsibility for minor distribution improvements to the owner.

### **B. Extensions to Existing Distribution Systems**

If the engineering plans are solely for the extension to an existing distribution system, only such information as is necessary for a clear understanding of the proposed extension will be required. This information must, in general, conform to the requirements for a complete system.

All construction plans and specifications for the construction of new systems or extensions, expansions or modifications of existing systems submitted to the Department for review shall be in full compliance with all Plan Review Policy Statements issued by the Department and signed by the Director of the Department of Health.

**C. Construction Verification:**

The owner or his authorized agent shall retain the design engineer, another competent engineer, or, if approved by the Arkansas Department of Health, the supplying water utility, to ensure that the project is constructed in accordance with the engineering plans and specifications as approved by the Department. The Department may require the inspecting engineer or utility to submit a statement following substantial completion documenting that a project was constructed in accordance with the Department approved plans and specifications.

**XXII. ENGINEERS REPORT**

**A. Design Data**

A report, written by the designing or consulting engineer, shall be presented with all engineering plans and shall give all data upon which the design is based, or which is required for the complete understanding of the engineering plans.

**B. Surface Water Supply.**

If a surface supply is proposed, the nature and extent of the watershed with special reference to its sanitary condition and anticipated maximum and minimum water yield shall be fully and explicitly discussed, together with proposed methods and regulations for the prevention of accidental or other pollution. A small scale map of the watershed, showing the roads and number and character of the buildings, shall be included in the report. Other features that should be discussed in the report are storage, capacity, average depth, general nature and area of the storage reservoir, probable water quality of the source, and proposed treatment processes. Treatment must be based on a thorough study of raw water quality.

**C. Ground Water Supply.**

If a well supply is proposed, the number, depth, size and construction, method of pumping, type of strainer, geological formations through which wells will be drilled, and probable yield of the wells shall be given. Treatment must be provided based upon a thorough study of raw water quality. If collecting galleries are to be used, describe their construction. A map shall be submitted showing the location of all buildings, privies, sewers, underground conduits or other possible sources of contamination within 1320 feet of the proposed wells, galleries or gravity conduits.

#### **D. Unsupplied Area**

Should there be areas within the area served by the public water system which, on account of topography or other reasons, cannot feasibly be supplied with water, a definite statement to this effect must be made and the probable future methods of supplying water to the area should be discussed.

#### **E. Estimate of Cost**

An estimate of the cost for the construction of the water supply, source of supply, water treatment plant and/or distribution system shall accompany all engineering plans. The estimate shall include quantities of the necessary materials.

#### **F. Plan Review Fee.**

In accordance with Act 469 of 1965, as amended (Ark. Code Ann. § 20-123 et seq.), a review fee of one percent (1%) of the estimated cost shall be submitted with the engineering plans and specifications. The maximum fee is five hundred dollars (\$500.00). A minimum fee of \$50.00 is required. Unless the maximum fee is paid, a detailed cost estimate must accompany the engineering plans and specifications. No fee is required for preliminary engineering reports.

### **XXIII. RIGHT OF ACCESS**

The owners of public water systems shall permit reasonable access to personnel of the Arkansas Department of Health for the purpose of inspection of facilities and records, or collection of samples. Access shall be permitted whether or not there is any question that the system is in compliance with applicable legal requirements.

### **XXIV. ADMINISTRATIVE PENALTY AUTHORITY**

The Arkansas Department of Health shall have the authority to assess administrative penalties against any public water system and/or its authorized agent for failure to comply with any portion of these regulations, provided that such penalties and procedures are in accordance with Arkansas Statutes.

### **XXV. ANNUAL FEES**

The annual fees for public water systems provided for in Arkansas Statutes § 20-28-101 et seq are established at \$0.30 per service connection per month for community and nontransient noncommunity water systems, with a minimum fee of \$250; and at \$125 for transient noncommunity water systems.

## **XXVI. SEVERABILITY**

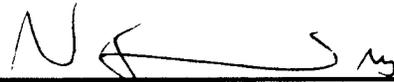
If any provision of these Rules and Regulations, or the application thereof to any person or circumstances is held invalid, such provisions or applications of these Rules and Regulations which can give effect without the invalid provisions or applications, and to this end the provisions hereto are declared to be severable.

## **XXVII. REPEAL**

All Regulations and parts of Regulations in conflict herewith are hereby repealed.

## **CERTIFICATION**

This will certify that the foregoing Rules and Regulations Pertaining to Public Water Systems were adopted by the Arkansas State Board of Health at a regular session of the Board held in Little Rock, Arkansas on January 23, 2014.



Nathaniel Smith, MD, MPH, Secretary  
Arkansas State Board of Health  
Director and State Health Officer  
Arkansas Department of Health



# National Primary Drinking Water Regulations

Contaminant	MCL or TT <sub>1</sub> (mg/L) <sub>2</sub>	Potential health effects from long-term <sub>3</sub> exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L) <sub>2</sub>
<b>OC</b> Acrylamide	TT <sub>1</sub>	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/wastewater treatment	zero
<b>OC</b> Alachlor	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	zero
<b>R</b> Alpha/positron emitters	15 pCi/L (picocuries per Liter)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	zero
<b>IOC</b> Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	0.006
<b>IOC</b> Arsenic	0.010	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production wastes	0
<b>IOC</b> Asbestos (fibers >10 micrometers)	7 MFL (million fibers per Liter)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7MFL
<b>OC</b> Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	0.003
<b>IOC</b> Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	2
<b>OC</b> Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	zero
<b>OC</b> Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	zero
<b>IOC</b> Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	0.004
<b>R</b> Beta photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation	zero
<b>DBP</b> Bromate	0.010	Increased risk of cancer	Byproduct of drinking water disinfection	zero
<b>IOC</b> Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	0.005
<b>OC</b> Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	0.04
<b>OC</b> Carbon tetrachloride	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities	zero
<b>D</b> Chloramines (as Cl <sub>2</sub> )	MRDL=4.0 <sub>1</sub>	Eye/nose irritation; stomach discomfort; anemia	Water additive used to control microbes	MRDLG=4.0 <sub>1</sub>
<b>OC</b> Chlordane	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide	zero
<b>D</b> Chlorine (as Cl <sub>2</sub> )	MRDL=4.0 <sub>1</sub>	Eye/nose irritation; stomach discomfort	Water additive used to control microbes	MRDLG=4.0 <sub>1</sub>
<b>D</b> Chlorine dioxide (as ClO <sub>2</sub> )	MRDL=0.8 <sub>1</sub>	Anemia; infants, young children, and fetuses of pregnant women: nervous system effects	Water additive used to control microbes	MRDLG=0.8 <sub>1</sub>
<b>DBP</b> Chlorite	1.0	Anemia; infants, young children, and fetuses of pregnant women: nervous system effects	Byproduct of drinking water disinfection	0.8
<b>OC</b> Chlorobenzene	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories	0.1
<b>IOC</b> Chromium (total)	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	0.1
<b>IOC</b> Copper	TT <sub>2</sub> Action Level=1.3	Short-term exposure: Gastrointestinal distress. Long-term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits	1.3
<b>M</b> <i>Cryptosporidium</i>	TT <sub>1</sub>	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero

## LEGEND

**D** Disinfectant

**IOC** Inorganic Chemical

**OC** Organic Chemical

**DBP** Disinfection Byproduct

**M** Microorganism

**R** Radionuclides

Contaminant		MCL or TT <sub>1</sub> (mg/L) <sub>2</sub>	Potential health effects from long-term <sub>3</sub> exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L) <sub>2</sub>
<b>IOC</b>	Cyanide (as free cyanide)	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories	0.2
<b>OC</b>	2,4-D	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops	0.07
<b>OC</b>	Dalapon	0.2	Minor kidney changes	Runoff from herbicide used on rights of way	0.2
<b>OC</b>	1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	zero
<b>OC</b>	o-Dichlorobenzene	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories	0.6
<b>OC</b>	p-Dichlorobenzene	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories	0.075
<b>OC</b>	1,2-Dichloroethane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
<b>OC</b>	1,1-Dichloroethylene	0.007	Liver problems	Discharge from industrial chemical factories	0.007
<b>OC</b>	cis-1,2-Dichloroethylene	0.07	Liver problems	Discharge from industrial chemical factories	0.07
<b>OC</b>	trans-1,2-Dichloroethylene	0.1	Liver problems	Discharge from industrial chemical factories	0.1
<b>OC</b>	Dichloromethane	0.005	Liver problems; increased risk of cancer	Discharge from drug and chemical factories	zero
<b>OC</b>	1,2-Dichloropropane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
<b>OC</b>	Di(2-ethylhexyl) adipate	0.4	Weight loss, liver problems, or possible reproductive difficulties	Discharge from chemical factories	0.4
<b>OC</b>	Di(2-ethylhexyl) phthalate	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories	zero
<b>OC</b>	Dinoseb	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables	0.007
<b>OC</b>	Dioxin (2,3,7,8-TCDD)	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories	zero
<b>OC</b>	Diquat	0.02	Cataracts	Runoff from herbicide use	0.02
<b>OC</b>	Endothall	0.1	Stomach and intestinal problems	Runoff from herbicide use	0.1
<b>OC</b>	Endrin	0.002	Liver problems	Residue of banned insecticide	0.002 <del>zero</del>
<b>OC</b>	Epichlorohydrin	TT <sub>1</sub>	Increased cancer risk; stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals	0.7
<b>OC</b>	Ethylbenzene	0.7	Liver or kidney problems	Discharge from petroleum refineries	zero
<b>OC</b>	Ethylene dibromide	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries	zero <sub>6</sub>
<b>M</b>	Fecal coliform and <i>E. coli</i>	MCL <sub>6</sub>	Fecal coliforms and <i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes may cause short term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.	Human and animal fecal waste	
<b>IOC</b>	Fluoride	4.0	Bone disease (pain and tenderness of the bones); children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	4.0
<b>M</b>	<i>Giardia lamblia</i>	TT <sub>7</sub>	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
<b>OC</b>	Glyphosate	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use	0.7
<b>DBP</b>	Haloacetic acids (HAA5)	0.060	Increased risk of cancer	Byproduct of drinking water disinfection	n/a <sub>9</sub>
<b>OC</b>	Heptachlor	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide	zero
<b>OC</b>	Heptachlor epoxide	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor	zero
<b>M</b>	Heterotrophic plate count (HPC)	TT <sub>7</sub>	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment	n/a

LEGEND

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**DBP** Disinfection Byproduct

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Contaminant	MCL or TT <sub>1</sub> (mg/L) <sup>2</sup>	Potential health effects from long-term <sub>3</sub> exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L) <sup>2</sup>
<b>OC</b> Hexachlorobenzene	0.01	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories	zero
<b>OC</b> Hexachlorocyclopentadiene	0.05	Kidney or stomach problems	Discharge from chemical factories	0.05
<b>IOC</b> Lead	TT <sub>5</sub> ; Action Level=0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities; Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits	zero
<b>M</b> <i>Legionella</i>	TT <sub>7</sub>	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems	zero
<b>OC</b> Lindane	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens	0.0002
<b>IOC</b> Mercury (inorganic)	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands	0.002
<b>OC</b> Methoxychlor	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	0.04
<b>IOC</b> Nitrate (measured as Nitrogen)	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	10
<b>IOC</b> Nitrite (measured as Nitrogen)	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	1
<b>OC</b> Oxamyl (Vydate)	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes	0.2
<b>OC</b> Pentachlorophenol	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood-preserving factories	zero
<b>OC</b> Picloram	0.5	Liver problems	Herbicide runoff	0.5
<b>OC</b> Polychlorinated biphenyls (PCBs)	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals	zero
<b>R</b> Radium 226 and Radium 228 (combined)	5 pCi/L	Increased risk of cancer	Erosion of natural deposits	zero
<b>IOC</b> Selenium	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines	0.05
<b>OC</b> Simazine	0.004	Problems with blood	Herbicide runoff	0.004
<b>OC</b> Styrene	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills	0.1
<b>OC</b> Tetrachloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners	zero
<b>IOC</b> Thallium	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories	0.0005
<b>OC</b> Toluene	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories	1
<b>M</b> Total Coliforms	5.0 percents	Coliforms are bacteria that indicate that other, potentially harmful bacteria may be present. See fecal coliforms and <i>E. coli</i>	Naturally present in the environment	zero
<b>DBP</b> Total Trihalomethanes (THMs)	0.080	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection	n/a <sup>4</sup>
<b>OC</b> Toxaphene	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle	zero
<b>OC</b> 2,4,5-TP (Silvex)	0.05	Liver problems	Residue of banned herbicide	0.05
<b>OC</b> 1,2,4-Trichlorobenzene	0.07	Changes in adrenal glands	Discharge from textile finishing factories	0.07
<b>OC</b> 1,1,1-Trichloroethane	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories	0.2
<b>OC</b> 1,1,2-Trichloroethane	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories	0.003
<b>OC</b> Trichloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories	zero

LEGEND

**D** Disinfectant

**IOC** Inorganic Chemical

**OC** Organic Chemical

**DBP** Disinfection Byproduct

**M** Microorganism

**R** Radionuclides

Contaminant	MCL or TT <sub>1</sub> (mg/L) <sup>2</sup>	Potential health effects from long-term <sup>3</sup> exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L) <sup>2</sup>
<b>M</b> Turbidity	TT <sub>1</sub>	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause short term symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff	n/a
<b>R</b> Uranium	30µg/L	Increased risk of cancer, kidney toxicity	Erosion of natural deposits	zero
<b>OC</b> Vinyl chloride	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories	zero
<b>M</b> Viruses (enteric)	TT <sub>1</sub>	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
<b>OC</b> Xylenes (total)	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories	10

#### LEGEND

<b>D</b> Disinfectant	<b>IOC</b> Inorganic Chemical	<b>OC</b> Organic Chemical
<b>DBP</b> Disinfection Byproduct	<b>M</b> Microorganism	<b>R</b> Radionuclides

#### NOTES

- Definitions
  - Maximum Contaminant Level Goal (MCLG)—The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are
  - Maximum Contaminant Level (MCL)—The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment
  - Maximum Residual Disinfectant Level Goal (MRDLG)—The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
  - Maximum Residual Disinfectant Level (MRDL)—The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for
  - Treatment Technique (TT)—A required process intended to reduce the level of a contaminant in
  - Viruses: 99.99 percent removal/inactivation
  - Legionella*: No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated according non-enforceable to the treatment techniques in the surface water treatment rule, *Legionella* will also be controlled.
  - Turbidity: For systems that use conventional or direct filtration, at no time can turbidity (cloudiness of water) go higher than 1 nephelometric turbidity unit (NTU), and samples for turbidity must be technology and taking less than or equal to 0.3 NTU in at least 95 percent of the samples in any month. Systems that use filtration other than conventional or direct filtration must follow state limits, which must include turbidity at no time exceeding 5 NTU.
  - HPC: No more than 500 bacterial colonies per milliliter
  - Long Term 1 Enhanced Surface Water Treatment: Surface water systems or ground water systems under the direct influence of surface water serving fewer than 10,000 people must comply with the control of microbial applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, updated watershed control drinking water. requirements for unfiltered systems).
  - Long Term 2 Enhanced Surface Water Treatment: This rule applies to all surface water systems or ground water systems under the direct influence of surface water. The rule targets additional *Cryptosporidium* treatment requirements for higher risk systems and includes provisions to reduce risks from uncovered finished water storages facilities and to ensure that the systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts. (Monitoring start dates are staggered by system size. The largest systems (serving at least 100,000 people) will begin monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) will not begin monitoring until October 2008. After completing monitoring and determining their treatment bin, systems generally have three years to comply with any additional treatment requirements.)
  - Filter Backwash Recycling: The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.
- Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent
- Health effects are from long-term exposure unless specified as short-term exposure.
- Each water system must certify annually, in writing, to the state (using third-party or manufacturers certification) that when it uses acrylamide and/or epichlorohydrin to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05 percent dosed at 1 mg/L (or equivalent); Epichlorohydrin = 0.01 percent dosed at 20 mg/L (or equivalent).
- Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level,
- A routine sample that is fecal coliform-positive or *E. coli*-positive triggers repeat samples—if any repeat sample is total coliform-positive, the system has an acute MCL violation. A routine sample that is total coliform-positive and fecal coliform-negative or *E. coli*-negative triggers repeat samples—if any repeat sample is fecal coliform-positive or *E. coli*-positive, the system has an acute MCL violation. See also Total Coliforms.
- EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:
  - Cryptosporidium*: 99 percent removal for systems that filter. Unfiltered systems are required to include *Cryptosporidium* in their existing watershed control provisions.
  - Giardia lamblia*: 99.9 percent removal/inactivation
- No more than 5.0 percent samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or *E. coli*. If two consecutive TC-positive samples, and one is also positive for *E. coli* or fecal coliforms, system has an acute MCL violation.
- Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:
  - Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L)
  - Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L)

# National Secondary Drinking Water Regulation

National Secondary Drinking Water Regulations are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, some states may choose to adopt them as enforceable standards.

<u>Contaminant</u>	<u>Secondary Maximum Contaminant Level</u>
<u>Aluminum</u>	<u>0.05 to 0.2 mg/L</u>
<u>Chloride</u>	<u>250 mg/L</u>
<u>Color</u>	<u>15 (color units)</u>
<u>Copper</u>	<u>1.0 mg/L</u>
<u>Corrosivity</u>	<u>noncorrosive</u>
<u>Fluoride</u>	<u>2.0 mg/L</u>
<u>Foaming Agents</u>	<u>0.5 mg/L</u>
<u>Iron</u>	<u>0.3 mg/L</u>
<u>Manganese</u>	<u>0.05 mg/L</u>
<u>Odor</u>	<u>3 threshold odor number</u>
<u>pH</u>	<u>6.5-8.5</u>
<u>Silver</u>	<u>0.10 mg/L</u>
<u>Sulfate</u>	<u>250 mg/L</u>
<u>Total Dissolved Solids</u>	<u>500 mg/L</u>
<u>Zinc</u>	<u>5 mg/L</u>

## For More Information

EPA's Safe Drinking Water Web site:  
<http://www.epa.gov/safewater/>

EPA's Safe Drinking Water Hotline:  
(800) 426-4791

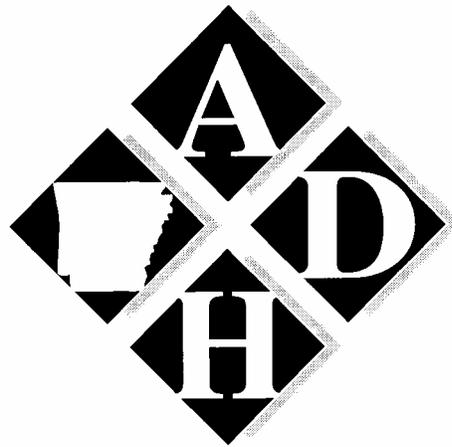
To order additional posters or other ground water and drinking water publications, please contact the National Service Center for Environmental Publications at :  
(800) 490-9198, or  
email: [nscep@bps-lmit.com](mailto:nscep@bps-lmit.com).



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# **Water Operator Licensing Law**

**Act 333 of 1957**



**Arkansas Department of Health**

**Bureau of Environmental Health Services**

**Division of Engineering**

**1997**

## **ACT 333 OF 1957** (As Amended)

### AN ACT TO PROVIDE FOR LICENSING OF PUBLIC WATER SUPPLY OPERATORS

Act 333 of 1957 has been amended by Act 1001 Of 1991, Act 787 of 1995 and Act 494 of 1997. (Title 17, Chapter 51, Sections 1 and 2, of the Arkansas Code of 1987 Annotated (1995 Supp.).

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF ARKANSAS:

17-51-101. Definitions. As used in this chapter, unless the context otherwise requires:

- (a) 'Water system operator' means any person who, during the performance of his regular duties at a community public water system, a non-transient non-community public water system, or any other noncommunity public water system which utilizes a surface water or surface water influenced source, exercises individual judgment by which, whether directly or indirectly, the safety, quality, and quantity of water delivered from the water system might be affected;
- (b) 'Board' means the State Board of Health;
- (c) 'Committee' means the Drinking Water Advisory and Operator Licensing Committee;
- (d) 'Public Water System' means all sources and their surroundings from which water is derived for drinking or domestic purposes by the public, and all structures, conduits, and appurtenances in connection therewith by which water for such use is obtained, treated, conditioned, stored and delivered to the public;
- (e) 'Community public water system' means any public water system which serves at least fifteen (15) connections or twenty-five (25) persons who are year-round residents;
- (f) 'Non-Community public water system' means a public water system that serves fifteen (15) service connections or twenty-five (25) persons, at least sixty (60) days per year, that is not a community public water system;

- (g) 'Late renewal' means an application for renewal when the application for renewal or the associated fee is received more than thirty (30) days following the beginning of a renewal period;
- (h) 'Department' means the Arkansas Department of Health;
- (i) 'Treatment' means the application of physical processes and/or the addition of chemicals to water which a public water system provides to the public, for the purposes of improving the quality of the water, except that the addition of gaseous chlorine, sodium hypochlorite, or calcium hypochlorite alone shall not be defined as treatment;
- (j) Non-transient non-community public water system means a public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons over six (6) months per year.
- (k) Drinking Water Operator Certification Program means those activities conducted by the Department of Health and the Drinking Water Advisory and Operator Licensing Committee related to the training, examination, and licensing and certification of public water system operators.

17-51-102 Penalties.

- (a) Any person or persons, representing a firm, corporation, municipality, or other political authority who violates any of the provisions of this chapter shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not less than one hundred dollars (\$100) nor more than five hundred (\$500) or by imprisonment in the county jail for not more than thirty (30) days, or by both such fine and imprisonment. Each day during which a violation continues shall be a separate offense.
- (b) Every firm, person, or corporation who violates this act or any of the rules or regulations issued or promulgated by the State Board of Health, or who violates any condition of a license, permit, certificate, or any other type of registration issued by the board may be assessed a civil penalty by the board. The penalty shall not exceed one thousand dollars (\$1,000) for each violation. Each day of a continuing violation may be deemed a separate violation for purposes of penalty calculation.

- (c) All fines collected under this section shall be deposited in the State Treasury and credited to the Waterworks Operators Licensing fund to defray the costs of administering this section.
- (d) Subject to such rules and regulations as may be implemented by the Chief Fiscal Officer of the State, the disbursing officer of the Department of Health is authorized to transfer all unexpended funds relative to fines collected under this subsection, as certified by the Chief Fiscal Officer of the State, to be carried forward and made available for expenditures for the same purpose for any following year.

17-51-103. Powers and duties of the Board.

- (a) The board shall have the authority to:
  - (1) Adopt rules and regulation in accordance with this chapter as may be necessary for the administration and enforcement of this chapter;
  - (2) Set fees to cover the cost of the administration of this chapter;
  - (3) Revoke a water system operator's license for cause;
  - (4) Establish minimum educational standards for all applicants for licensure.

17-51-104. Drinking Water Advisory and Operator Licensing Committee Creation - Members.

- (a) There is created the Drinking Water Advisory and Operator Licensing Committee to consist of seven (7) members to be appointed by the board;
  - (1) One (1) shall be a member of the staff of the Division of Engineering of the Department of Health who shall be a registered engineer and who shall act as executive secretary for the board for water system operator licensing activities, and also act as executive secretary for the committee;
  - (2) One (1) shall be an engineer on the teaching staff of any state-supported institution of higher education who shall be either a sanitary engineer, civil engineer, environmental engineer, or chemical engineer with expertise in the drinking water field;

- (3) Four (4) members shall be active water system operators who shall hold the highest grade licenses;
  - (4) One (1) member shall be a consulting engineer specializing in drinking water systems design;
- (b) Initial appointments shall be as follows:
- (1) One (1) member shall serve a term of one (1) year;
  - (2) One (1) member shall serve for two (2) years;
  - (3) One (1) member shall serve for three(3) years;
  - (4) One (1) member shall serve for four (4) years;
  - (5) One (1) member shall serve for five (5) years;
  - (6) One (1) member shall serve for six (6) years; and
  - (7) Each subsequent regular appointment shall be for a term of six (6) years, provided that no person shall be appointed to serve more than one (1) full six year term.
- (c) In event of vacancy, a new member shall be appointed by the board to serve out the unexpired term.
- (d) A member of the committee may be removed for cause only after the board has made an investigation at which the accused has had an opportunity to defend himself against any and all charges.
- (e) The committee shall serve without remuneration, but shall be entitled to reimbursement for actual expenses incurred in the performance of their duties.
- (f) All members of the committee shall be residents of the State of Arkansas. All members of the Water Operator Licensing Committee at the time of the effective date of this chapter shall be automatically appointed to terms on the committee which correspond to their remaining terms on the Water Operator Licensing Committee.
- (g) The member of the committee who is a member of the staff of the Division of Engineering of the department shall serve at the pleasure of the Director of the Department of Health.

17-51-105. Drinking Water Advisory and Operator Licensing Committee - Duties.

- (a) The duties of the committee shall be as follows:

- (1) to assist the department in examining applicants for water system operator licenses;
- (2) to advise the department as to the fitness of the applicant for licensing and certification;
- (3) to advise the board in cases of suspension and revocation of license;
- (4) to advise the board and department in all matters, upon request by the board or department, or upon its own motion, relating to the operations of, and the development of regulations for, the Public Water System Supervision Program operated by the Division of Engineering of the Department; and
- (5) to advise the board or department in all matters, upon request by the board or department, relating to training programs for water system operators.

17-51-106. Fees.

(a) The board shall have the authority to:

- (1) Set fees to cover only the cost of the administration of this chapter;
- (2) Establish fees for:
  - (A) Examination;
  - (B) Licensing;
  - (C) Renewal of license;
  - (D) Penalty for late renewal;
  - (E) Evaluation for reciprocity; and
  - (F) Temporary permit issuance or renewal.

(b) Fees shall not exceed:

- (1) Fifty dollars (\$50.00) for examination;
- (2) Twenty-five dollars (\$25.00) for licensing;
- (3) Fifty dollars (\$50.00) for renewal of license;
- (4) Ten dollars (\$10.00) for penalty for late renewal;
- (5) Fifty dollars (\$50.00) for evaluation for reciprocity; and
- (6) Twenty-five dollars (\$25.00) for temporary permits or renewal of temporary permits.

(c) Disposition of funds.

- (1) All fees collected under this chapter are declared special revenues and shall be deposited in the State Treasury to the credit of the Public Health Fund, and such monies shall be expended only for the administration of this chapter.
- (2) Subject to such rules and regulations as may be implemented by the Chief Fiscal Officer of the State, the disbursing officer for the Department of Health is authorized to transfer all unexpended funds relative to the Drinking Water Operator Certification Program that pertain to fees collected, as certified by the Chief Fiscal Officer of the State, to be carried forward and made available for expenditures for the same purpose in any following fiscal year.

17-51-201. License required.

- (a) In order to safeguard the public health, all operators of community and certain non-community public water systems, from which water is sold, distributed, or otherwise offered for human consumption, whether such water systems are publicly or privately owned and operated, shall be licensed and certified as competent by the department under the provisions of this chapter and under such rules and regulations as the board may adopt under the provisions of this chapter.
- (b) It shall be unlawful for any person, municipality, political subdivision, corporation, partnership, sole proprietorship, or any authority that furnishes water for domestic consumption to operate any type of community public water system, non-transient non-community public water system, or any other non-community public water system utilizing a surface water or surface water influenced source, unless the operator in charge is duly licensed and certified competent by the Department of Health.
- (c) It shall be unlawful for any person to perform the duties of an operator without being duly licensed or to falsely represent himself as a licensed operator.
- (d) It shall also be unlawful for any public or private official, not duly licensed, to attempt to influence the judgment of a licensed operator in matters where the public health may be involved unless this official is an authorized representative of the Department of Health.

17-51-202. Classifications - Examinations.

- (a) Water system operators shall be licensed in appropriate grades according to responsibilities and in accordance with classifications designated by the board which consider both the population served and the level of treatment required to produce an acceptable quality water.
- (b) Applicants for examination for licensing shall be examined in the various phases of water system operation as designated by the board.
- (c) At its discretion the committee may delete or modify any of the adopted requirements where they are not applicable, but the licenses granted shall be limited and valid only under the conditions described.
- (d) The committee at its discretion may waive the requirements, or any part of the requirements, for formal examination of an applicant for a license if the applicant holds a valid license or certificate from another state in which the requirements for license in the appropriate grade are at least equal to the requirements set forth by the board.
- (e) The department shall conduct examinations to establish the qualifications of applicants for licensure. The department shall conduct regular examination sessions, at least annually, and may conduct additional examination sessions whenever it deems necessary.

17-51-203. Issuance - Temporary Permits

- (a) The department shall license and certify all applicants for licenses under this chapter who satisfy the requirements of this chapter. Licenses shall be granted according to classifications set forth by the board.
- (b) In an emergency, the department at its discretion may grant temporary permits for operation of a water system when and only when the public health and safety are not jeopardized. The temporary permit shall be valid for a period of not more than one (1) calendar year, and may be renewed only once, with the approval of the department.

17-51-204. Renewal - Standing

- (a) Licenses shall be valid for a period of two (2) years and shall be renewable by the department upon application without examination, provided the applicant is in good standing.

- (b) The licensee, in order to remain in good standing, shall demonstrate his interest in the technical developments of water system operation by fulfilling requirements as the board may direct.

17-51-205. Suspension - Revocation - Reinstatement

- (a) The department shall suspend the license of an operator for cause.
- (b) The suspension shall remain in effect until the case can be reviewed by the committee, where the licensee shall have the opportunity to present his defense.
- (c) After the committee has reported its findings to the board, the board shall uphold the department's suspension of the license, reinstate the licensee, or revoke the license.
- (d) A license so revoked may be reinstated only if all the conditions that caused revocation have been removed.

17-51-206. All rules and regulations promulgated pursuant to this act shall be reviewed by the Joint Interim Committee on Public Health, Welfare, and Labor or an appropriate subcommittee thereof.

17-51-207. All provisions of this act of a general and permanent nature are amendatory to the Arkansas Code of 1987 Annotated and the Arkansas Code Revision Commission shall incorporate the same in the Code.

17-51-208. If any provision of this act or the application thereof to any person or circumstances is held invalid, such invalidity shall not affect other provisions or applications of the act which can be given effect without the invalid provision or application, and to this end the provisions of this act are declared to be severable.

17-51-209. All laws and parts of laws in conflict with this act are hereby repealed.

As Approved

(This is a compilation of Act 333 of 1957 and its subsequent revisions or additions by Act 1001 Of 1991, Act 787 of 1995 and Act 494 of 1997. Compiled June 26, 2001.)

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# ARKANSAS STATE BOARD OF HEALTH

## SHARED SERVICES DIVISION OF ENGINEERING

### RULES AND REGULATIONS PERTAINING TO WATER OPERATOR LICENSING

Promulgated under the authority of Act 333 of 1957,  
Act 1001 of 1991 and Act 494 of 1997

This Revision Effective  
**January 1, 2003**  
By the Arkansas Board of Health

Arkansas Department of Health  
Little Rock, Arkansas  
Fay Boozman, M.D., Director

## SECTION I. AUTHORITY

The following Rules and Regulations Pertaining to Water Operator Licensing are duly adopted and promulgated by the Arkansas State Board of Health pursuant to the authority expressly conferred by the Laws of the State of Arkansas including, without limitation, Act 96 of 1913, as amended, and Act 333 of 1957 as amended. (See Arkansas Codes Annotated, Title 17, Chapter 51, Sections 101 - 106, and Sections 201 - 205)

## SECTION II. PURPOSE

These Rules and Regulations are adopted for the purpose of ensuring that all public water systems in the State of Arkansas are operated by personnel who have shown their competence and knowledge of the public health and scientific principles necessary to produce and deliver adequate quantities of water which meets or exceeds the National Primary and Secondary Drinking Water Standards.

## SECTION III. DEFINITIONS

- A. **ADVANCED TREATMENT** means the application of physical processes (Some examples are aerators, clarifiers or filters.) to water, for the purposes of improving the quality or condition of the water.
- B. **BOARD** means the Arkansas State Board of Health.
- C. **COMMITTEE** means the Drinking Water Advisory And Operator Licensing Committee.
- D. **DEPARTMENT** means the Arkansas Department of Health.
- E. **LATE RENEWAL** means an application for renewal when the application for renewal or the associated fee is received more than thirty (30) days following the beginning of a renewal period.
- F. **OPERATE** means to make decisions or conduct acts that contribute to the production, treatment, or delivery of potable water by the water system, if such decisions or acts involve process control or system integrity.
- G. **OPERATING SHIFT** means that period of time during which operator decisions that affect public health are necessary for proper operation of the water system.
- H. **OWNER** means any person, firm, corporation, institution, or governmental agency, or their agent, owning, operating, or modifying any public water system, water distribution facility or water treatment facility.
- I. **PUBLIC WATER SYSTEM or PWS** means all sources and their surroundings

from which water is derived for drinking or domestic purposes by the public, and all structures, conduits, and appurtenances in connection therewith by which water for such use is obtained, treated, conditioned, stored or delivered to the public, if such system has at least fifteen service connections or serves an average of twenty-five individuals daily at least 60 days per year.

1. COMMUNITY PUBLIC WATER SYSTEM means any public water systems, which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
  2. NON-COMMUNITY PUBLIC WATER SYSTEM means a public water system that serves at least 15 service connections or 25 persons per day that is not a community water system.
    - a. NON-TRANSIENT NON-COMMUNITY PUBLIC WATER SYSTEM means a Non-Community Water System that serves at least 25 of the same individuals at least 180 days (or portions thereof) per year.
    - b. TRANSIENT NON-COMMUNITY PUBLIC WATER SYSTEM is any Non-Community Public Water System that is not a Non-Transient Non-Community Public Water System.
  3. CONSECUTIVE SYSTEMS are public water systems that obtain all or part of their water supply, either directly or indirectly, from another public water system.
  4. SMALL WATER SYSTEM shall mean a Public Water System serving a total population of less than 500, including the population of any consecutive Public Water Systems that it operates.
- J. SURFACE WATER means water that flows over or rests upon the surface of the earth.
- K. SURFACE WATER INFLUENCED SOURCE means any source with significant occurrence of insects or other macro-organisms, algae, or large diameter pathogens such as *Giardia lamblia*, or which is subject to significant changes in water quality which are determined to be in direct relationship with the climatological or surface water conditions.
- L. TREATMENT means the application of physical processes and/or the addition of chemicals to water which a public water system provides to the public, for the purposes of improving the quality of the water, except that the addition of gaseous chlorine, calcium hypochlorite or sodium hypochlorite alone shall not be defined as treatment.

- M. WATER DISTRIBUTION FACILITIES shall mean that portion of the public water system in which water is stored and conveyed from the water treatment facilities or other supply point to the premises of a water consumer. This type of facility would also include groundwater sources without treatment.
1. A single pressure plane distribution facility is a distribution network that has only one pressure gradient downstream of the source of supply.
  2. A multiple pressure plane distribution facility is a distribution network that has more than a single pressure gradient downstream of the source of supply. A booster pump station or a pressure reducing valve could create the additional pressure gradient. A booster pump or a pressure reducing valve serving an individual or small group of service connections would not be considered as a separate pressure gradient.
- N. WATER OPERATOR means any person who during the performance of their regular duties, at all community public water system, all non-transient non-community public water system, or any other non-community public water system that utilizes a surface water source or surface water influenced source, exercises individual judgment, whether directly or indirectly, that might affect the safety, quality, or quantity of water delivered from the water system. (The term Operator generally includes, but is not limited to, Managers, Assistant Managers, Superintendents, Assistant Superintendents, Construction and Maintenance Foremen, treatment plant personnel and other persons responsible for the operation and maintenance of wells, reservoirs, water treatment facilities, water distribution facilities, and pumping facilities.)
- O. WATER OPERATOR(S) IN RESPONSIBLE CHARGE is defined as the water operator(s) designated by the owner to be the licensed operator(s) who is in direct supervision of the water system regarding the daily operational activities and protocols that an operator(s) follows when operating a public water system, water treatment facility and/or distribution facility.
- P. WATER OPERATOR-IN-TRAINING means any Water Operator who has successfully completed the formal license examination, but has not met the experience requirement.
- Q. WATER TREATMENT FACILITIES shall mean that portion of the public water system in which water is obtained and treated.

#### SECTION IV. APPLICABILITY

These Rules and Regulations apply to Public Water Systems and any individual who seeks certification or licensure to perform the duties of a Water Operator or other activities for which certification or licensure as a Water Operator is available from the Department of Health. All Public Water Systems and any individual performing the duties of a Water Operator must comply with these Rules and Regulations.

## SECTION V. LICENSE TYPE AND GRADE OF LICENSE REQUIRED

- A. The owners of all community public water systems, all non-transient non-community public water systems, and those other non-community public water systems that utilize a surface water source or surface water influenced groundwater source must place the direct supervision of the water system under an available Water Operator(s) in Responsible Charge holding a valid license equal to or greater than the classification of the treatment facility and/or distribution facility.
- B. All Community public water systems, all Non-Transient Non-Community public water systems and those other non-community public water systems that utilize a surface water source or surface water influenced groundwater source must have a licensed operator available for each operating shift.
- C. Water Operators that perform water treatment facility duties must hold a valid active Water Treatment Operator License. Water Operators that perform duties in a water distribution facility must hold a valid active Water Distribution Operator License. Water Operators that perform both water treatment facility and water distribution facility duties must hold a valid active Water Treatment Operator License and a valid active Water Distribution Operator License.
- D. Water Treatment Facilities shall be classified as Grade I, Grade II, Grade III and Grade IV facilities according to the facilities size and complexity of treatment, with Grade IV being the largest most complex.
- E. Water Distribution Facilities shall be classified as Very Small Water System, Grade I, Grade II, Grade III and Grade IV facilities according to the facilities size and complexity of treatment, with Grade IV being the largest most complex.
- F. Water Treatment Facilities and Distribution Facilities shall be classified in accordance with Table 1. Water Operators, Operators In Responsible Charge or Operators-In-Training of these facilities shall be licensed in the appropriate grades and license types in accordance with Table 1. (See page 5 and Attachment 1.)
- G. Community and non-transient non-community public water systems and any other non-community public water system that utilizes a surface water source or surface water influenced source shall be classified based on the highest level of certification required to operate any of the system's treatment facilities and the highest level of certification required to operate any of the system's distribution facilities.

## Public Water System and Operator Required Licenses

### WATER TREATMENT OPERATOR LICENSE

TYPE OF TREATMENT	POPULATION SERVED (Include consecutive system population.)	IS ORC* OR A SUPERIOR?	LICENSE GRADE REQUIRED
CHEMICAL ADDITION	25 TO 3,299	//////////	I
	3,300 TO 9,999	YES	II
		NO	I
	10,000 TO 49,999	YES	III
		NO	II
	50,000 OR GREATER	YES	IV
		NO	III
	ADVANCED TREATMENT	25 TO 3,299	//////////
3,300 TO 9,999		YES	III
		NO	II
10,000 OR GREATER		YES	IV
		NO	III

### WATER DISTRIBUTION OPERATOR LICENSE

DISTRIBUTION FACILITY COMPLEXITY	POPULATION SERVED (Include consecutive system population, if operated by this water system.)	IS ORC* OR A SUPERIOR?	LICENSE GRADE REQUIRED
SINGLE PRESSURE PLANE - NO PUMP(S) EXCEPT SOURCE/WTP PUMP(S)	25 TO 499	//////////	SMALL SYSTEM
	500 TO 3,299	//////////	I
		3,300 TO 9,999	YES
	NO		I
	10,000 TO 49,999	YES	III
		NO	II
	50,000 OR GREATER	YES	IV
		NO	III
MULTIPLE PRESSURE PLANES	25 TO 499	//////////	I
	500 TO 3,299	//////////	II
	3,300 TO 9,999	YES	III
		NO	II
	10,000 OR GREATER	YES	IV
		NO	III

\*Operator in Responsible Charge

(Table 1)

- H. During routine sanitary surveys of public water systems, Department staff shall examine the organizational structure of each system, and identify all positions or classes of positions for which licensure is required and determine if they are a supervisory position for licensing purposes.
- I. The licensure determinations may be appealed by the public water systems to the Committee for their review and determination.
- J. Licensed operators must notify this office in writing of any changes in their employment, contract operation or volunteer status with a Public Water System.

**SECTION VI. EDUCATION REQUIREMENTS**

- A. Applicants for licensing shall have a high school diploma or General Equivalency Diploma or GED. On a case by case basis, the Committee may determine that an applicant's experience or relevant training can be substituted for the requisite high school diploma or General Equivalency Diploma. Any training or experience used for such substitution shall not be used to meet the minimum experience requirement.
- B. The mandatory minimum training requirements that must be met for each license grade and license type are contained in Table 2.

<b>TRAINING HOUR REQUIREMENTS FOR LICENSE EXAMS</b>										
<b>Course Name</b>	<b>Length</b>	<b>D-SS</b>	<b>D-1</b>	<b>D-2</b>	<b>D-3</b>	<b>D-4</b>	<b>T-1</b>	<b>T-2</b>	<b>T-3</b>	<b>T-4</b>
Rules, Regs, SDWA Compliance	8 hr	X	X	X	X	X	X	X	X	X
Basic Water Works Math	8 hr.	X	X	X	X	X	X	X	X	X
Applied Water Works Math	8 hr.			X	X	X		X	X	X
Distribution Basic	24 hr.	X	X	X	X	X				
Distribution Intermediate	24 hr.			X	X	X				
Distribution Advanced	24 hr.					X				
Treatment Basic	24 hr.						X	X	X	X
Treatment Intermediate	24 hr.							X	X	X
Treatment Advanced	24 hr.								X	X
	Tot. hrs.	40	40	72	72	96	40	72	96	96

**Table 2**

- C. Applicants for licensure must meet the minimum mandatory training

requirements prior to sitting for the license exam. It is the responsibility of the applicant to meet the mandatory training prior to sitting for an exam. Failure to meet the training requirements for the license exam grade and type taken will result in the invalidation of the license exam and forfeiture of the exam fee.

- D. The Licensing Committee, after determining that a required training course is not, and has not been, reasonably available in a geographical area of the State, may waive the mandatory training requirement for that course and area, for a specified period of time.
- E. All operators sitting for an exam after January 1, 2003 must meet the required training. Equivalent training attended prior to this date may be substituted for the required training requirements.
- F. Operators upgrading a license in good standing will be considered to have the training required for the license held.
- G. Education substitution for post secondary degrees will be as follows:
  - 1. Bachelors or Associates of Science or Applied Science Degree in an applicable physical science may be substituted for all the minimum training requirements except the Rules and Regulations Course and the course required for the specific license examination to be taken.
  - 2. A Bachelors or Associates of Applied Science in Water and Wastewater Technology may be substituted for the entire minimum training requirements except the Rules and Regulations Course.
  - 3. Post secondary degrees used to meet Education requirements cannot also be used to meet Experience requirement.

## SECTION VII. EXAMINATION REQUIREMENTS

- A. Applicants for licensing shall be examined to determine their skills, knowledge, ability, and judgment in the safe and proper operation of a public water system. The examination must consist of validated questions and be developed utilizing proper exam development procedures and validation protocols.
- B. An individual desiring to obtain a Water Operator License by examination shall file a license application, including the required license and exam fees, with the certification program not later than 60 days preceding the date of examination. The application will be valid for one year.
- C. An individual desiring to be examined shall be required to provide adequate photographic identification prior to receiving and when returning an

examination. All exams and related materials must be returned, prior to leaving the exam session. Failure to return the exam and related materials will result in administrative actions, penalties or criminal charges.

- D. Separate examinations shall be prepared for each certification classification. For grades I-IV a separate examination shall be prepared for the water treatment plant operation license and the distribution facility operation license.
- E. Grade I-IV examinations shall be written and consist of at least 100 questions. The very small system examination shall be written and consist of at least 50 questions. All examinations will be closed book, with math formulas provided.
- F. All examinations shall be scored by the Committee, or by others designated by the Committee, and the applicant shall be notified of the outcome. The test booklet shall not be returned to the applicant.
- G. Applicants who fail to pass the examination may repeat the examination at subsequent examination sessions. An additional examination fee is required for each examination. This fee must be received 15 days prior to sitting for the exam. An additional application is not required for repeated examinations, if the examination is repeated within one (1) year.

#### SECTION VIII. EXPERIENCE REQUIREMENTS

- A. Evaluation of the Experience requirement shall be based on completion of the following periods of approved work:

1.	Grade IV Treatment License	Three (3) years
	Grade IV Distribution License	Three (3) years
2.	Grade III Treatment License	Two (2) years
	Grade III Distribution License	Two (2) years
3.	Grade II Treatment License	One (1) Year
	Grade II Distribution License	One (1) year
4.	Grade I Treatment License	Six (6) months
	Grade I Distribution License	Six (6) Months
5.	Small System Distribution License	No experience requirement
- B. In order for work to meet the Experience requirement it must be from work or the supervision of work that is directly related to the license being obtained.
- C. Certain post-secondary degrees may be substituted for experience credit towards meeting the experience requirement. The degree must be shown on

the license application to be considered for credit. Experience credit will be allowed as shown in Table 3 at the end of this section.

- D. Post secondary degree used to meet Experience requirement cannot be used to meet Education requirements.

<b>POST SECONDARY DEGREE EXPERIENCE CREDIT</b>			
<b>Post Secondary Degree</b>	<b>License</b>	<b>Experience Allowed</b>	<b>License Appropriate Water System Experience Required</b>
Bachelor of Science degrees in Engineering, Chemistry, Biology, or other applicable physical sciences	Grade I	6 Months	Not Applicable
	Grade II	9 Months	3 Months
	Grade III	18 Months	6 Months
	Grade IV	24 Months	12 Months
Associate of Applied Science Degrees in Water and Wastewater Technology	Grade I	6 Months	Not Applicable
	Grade II	9 Months	3 Months
	Grade III	18 Months	6 Months
	Grade IV	24 Months	12 Months
Associate of Applied Science Degrees in Engineering, Electronics, Environmental Science, or other applicable physical sciences	Grade I	6 Months	Not Applicable
	Grade II	6 Months	3 Months
	Grade III	9 Months	6 Months
	Grade IV	12 Months	12 Months

**Table 3**

**SECTION IX. ISSUANCE OF LICENSES AND PERMITS**

- A. A license shall not be issued to any applicant until the education, examination and experience requirements have been successfully completed, or until the applicant has been successfully evaluated for reciprocity.
- B. An Operator-In-Training certificate shall be issued to a license applicant when the experience requirement has not been completed and the license examination has been successfully completed.
- C. Temporary permits will not be issued. To issue a Temporary Permit to an unlicensed operator of a public water system the Department must assure that its issuance will not jeopardize public health and safety. The Department cannot provide this assurance due to improved knowledge of water borne disease outbreaks and because Public Water Systems have an increased risk of microbial contamination.
- D. Inactive Licenses are no longer allowed. Licenses placed in the inactive status, when it was allowed, may be reinstated at any time, after approval by the

Department, by paying the required reinstatement fees and passing an examination on current Public Water System regulations, policies, and Safe Drinking Water Act compliance requirements. The Department shall require license examination be passed to reinstate the license if the inactive period exceeds ten (10) years. Examinations may be waived provided the operator can prove through closely related work that the operator has kept current with present Public Water System requirements.

## SECTION X. FEES ESTABLISHED

### A. Examination

The fee shall be \$25.00 per examination, the initial exam fee shall be paid at the time of License Application and all subsequent exam fees must be received 15 days in advance of the examination.

### B. License

The fee shall be \$10.00, paid at the time of License Application.

### C. License Renewal

The fee shall be \$10.00 for each two (2) year renewal period for each license or Operator-In-Training certificate renewed.

### D. Penalty for Late Renewal

The fee for penalty for late renewal shall be \$5.00.

### E. Reciprocity Evaluation

The fee for evaluating an applicant for reciprocity shall be \$25.00 per license evaluated.

### F. Reinstatement of Inactive License

The fee for reinstating an Inactive License shall be \$10.00 for each renewal period during which the license has not been active, provided that the total fee shall not exceed \$35.00.

### G. Reinstatement of Revoked License

The fee due to revocation shall be \$10.00 for each two (2) year renewal period and \$10.00 for a re-issuance of License.

## SECTION XI. EXAMINATION SESSIONS

A. Arkansas Water Works and Water Environment Association District Meeting

The Arkansas Department of Health shall assign personnel to conduct examinations for applicants for Licenses in each Arkansas Water Works and Water Environment Association District, upon request, during the months of July and November, at a predetermined and publicized location and time.

B. Annual Industry Association Conferences

The Arkansas Department of Health shall assign personnel to conduct examinations for applicants for Licenses in conjunction with the annual conferences of all major industry associations, upon request, with time and place to be publicized.

C. Other scheduled examination sessions.

The Arkansas Department of Health shall assign personnel to conduct examinations for applicants for Licenses at other examination sessions set by the Committee, at a predetermined and publicized location.

D. Special examinations

Any applicant for License may request a special examination to be given at a date other than the normally scheduled exam session. This request must be in writing to the Executive Secretary of the Licensing Committee and should detail the reasons the special examination is needed.

## SECTION XII. LICENSES

A. Issued

On satisfactory fulfillment of the certification requirements the Executive Secretary of the Committee shall issue a suitable license to the applicant designating their competency. The license shall state the licensed individual's name, the license grade and the license number.

B. Permanent

The license shall be permanent unless revoked for cause; replaced by a higher grade license; invalidated due to Section XI, Subsection A; or invalidated due to obtaining or renewing the license through fraud; deceit; or the submission of inaccurate qualifications or renewal data.

C. Reciprocity

Any applicant holding a valid License from another State with at least equal requirements of Act 333 of 1957, as amended, and its Rules and Regulations shall be issued a Water System Operator License. Such license shall be issued only after an evaluation has been made by the Department to insure that the applicant's out-of-state License is current and has equal requirements to the License to be issued. To obtain a license by reciprocity a license application and documentation of the License held must be filed with the required fees in Section VIII, Subsection B and E included.

D. Suspension

The Department with the knowledge and approval of the Director of the Arkansas Department of Health shall suspend a Water Operator's license, Operator-In-Training certificate or deny issuance of a license or certificate for cause, including but not limited to when it is found the license holder, operator in training or applicant:

1. Has practiced fraud or deception;
2. That reasonable care, judgment, or the application of their knowledge or ability was not used in the performance of their duties that resulted in water quality being compromised or any non-compliance with any state or federal requirement;
3. That the license holder, operator in training or applicant is incompetent, unable or not willing to perform their duties properly.

The suspension or denial shall remain in effect until the Committee reviews the case.

E. Revocation

The Committee shall hold a public hearing into the suspension. The Department will present their case and the Water Operator will have the opportunity to present his or her defense. The Committee shall then uphold or deny the suspension. If the suspension is upheld, the Committee shall report the findings of the Public Hearing to the Board and recommend the license remain suspended for a recommended time period or be revoked. The Board shall then reinstate, suspend or revoke the license.

F. Reinstatement

Any Licensed Water System Operator or Operator-In-Training who for any reason, other than revocation, desires to have a license reinstated may request, in a hearing before the Committee; that the Committee re-instate the license, with or without conditions. If the license is re-instated, payment of the applicable fees under Section VIII, Subsection C and F must be remitted.

## SECTION XIII. MAINTENANCE OF LICENSE

- A. In order to renew a Water Operator License or Operator-In-Training Certificate, the operator must certify to the Committee the attendance, at a minimum, of twenty-four (24) hours per two year renewal period of approved training instruction. No additional training instruction will be required to renew additional licenses each renewal period. At least twelve (12) of the approved hours must be in subjects directly applicable to the field of water supply, treatment, distribution, pumping, metering, or management; or the study of approved materials on the same subjects. The remaining twelve (12) hours of approved training may be indirectly applicable subject matter, such as personal operator safety, wastewater, plumbing inspection or cross-connection control certification courses. The various water operator associations' annual and monthly district meetings will be considered as directly applicable training. This subsection is effective with the start of the July 1, 2003 to June 30, 2005 renewal period.
- B. The Water Operator is responsible for submitting adequate documentation of the completion of the required training, at the time of license renewal. This documentation must include the date, subject, sponsor, and number of approved training hours for each training session completed and submitted for training credit.
- C. A License that has not been renewed in accordance with this section, within ninety days after the license has expired, shall be lapsed and invalid.
- D. Any licensee whose License has expired can request, within one (1) year of the date of expiration, the license be reinstated by the Department upon documentation of past renewal training requirements and the payment of the fees as stated in Section VIII, Subsection C and D.
- E. A Water Operator license or Operator-In-Training certificate that has been expired for more than one (1) year cannot be reinstated. It is necessary for such a license or certificate holder to reapply and be reexamined according to the requirements for new applicants.

#### SECTION XIV. SPECIAL PURPOSE LICENSE

A special purpose license is authorized for Transient Non-Community Public Water Systems that utilize groundwater sources that are Surface Water Influenced Sources. The license shall be restricted to these systems that utilize cartridge/bag filtration technology. The License exam will be a modified Small Water System License with specific questions added related to the very specialized simple to operate water treatment equipment (cartridge filtration) and microbial inactivation processes, being utilized by these systems to meet the Safe Drinking Water Act. The Act requires these systems to be operated by qualified personnel and this license will be used to demonstrate the operators of these systems meet that requirement.

The license exam shall have a minimum of 50 questions related to the topics of cartridge/bag filtration technology, microbial inactivation processes, surface water

treatment regulations, water distribution questions, and groundwater sources. Holders of this license shall be required to meet the same maintenance of license requirements as a Small System Distribution License holder or attend an Arkansas Department of Health renewal training course, each renewal period, designed specifically to address this type of system and the technology to which this license applies.

Operators of these specific systems may also utilize the Treatment and Distribution Licenses required of Surface Source Transient Non-Community Public Water System's.

#### SECTION XV. DRINKING WATER ADVISORY AND OPERATOR LICENSING COMMITTEE

- A. The Committee shall elect a Chair who shall serve for a term of one year. The election shall occur at the first meeting of the state fiscal year.
- B. The Committee shall utilize "Robert's Rules of Order" as a guide for procedures for conducting business.
- C. In the event that more than one person is appointed to the Committee at a particular Board meeting, the new appointees shall draw lots to determine which of the vacant terms that each shall fill.

#### SECTION XVI. MEETINGS

The Licensing Committee shall meet at least once a year and in special meetings called by the Chair or requested by the Arkansas Department of Health.

#### SECTION XVII. ADMINISTRATIVE PENALTY AUTHORITY

The Arkansas Department of Health shall have the authority to assess administrative penalties against any individual or any public water system for failure to comply with any portion of these regulations, in accordance with the requirements of ACA §§ 20-7-101, et seq, and ACA §§ 14-262-101, et seq.

#### SECTION XVIII. SEVERABILITY

If any provision of these Rules and Regulations, or the application thereof to any person or circumstances is held invalid, such invalidity shall not effect other provisions or applications of these Rules and Regulations which can be given effect without the invalid provisions or applications, and to this end the provisions hereto are declared to be severable.

## CERTIFICATION

This will certify that the foregoing Rules and Regulations Pertaining to Water Operator Licensing were adopted by the Arkansas Board of Health at a regular session of said Board held in Eureka Springs, Arkansas, on the twenty-third day of October, AD two thousand.

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Fay Boozman, M.D.  
Secretary of the Arkansas Board of Health  
Director, Arkansas Department of Health

Dated at Little Rock, Arkansas, this Thirtieth day of September, AD two thousand and two.

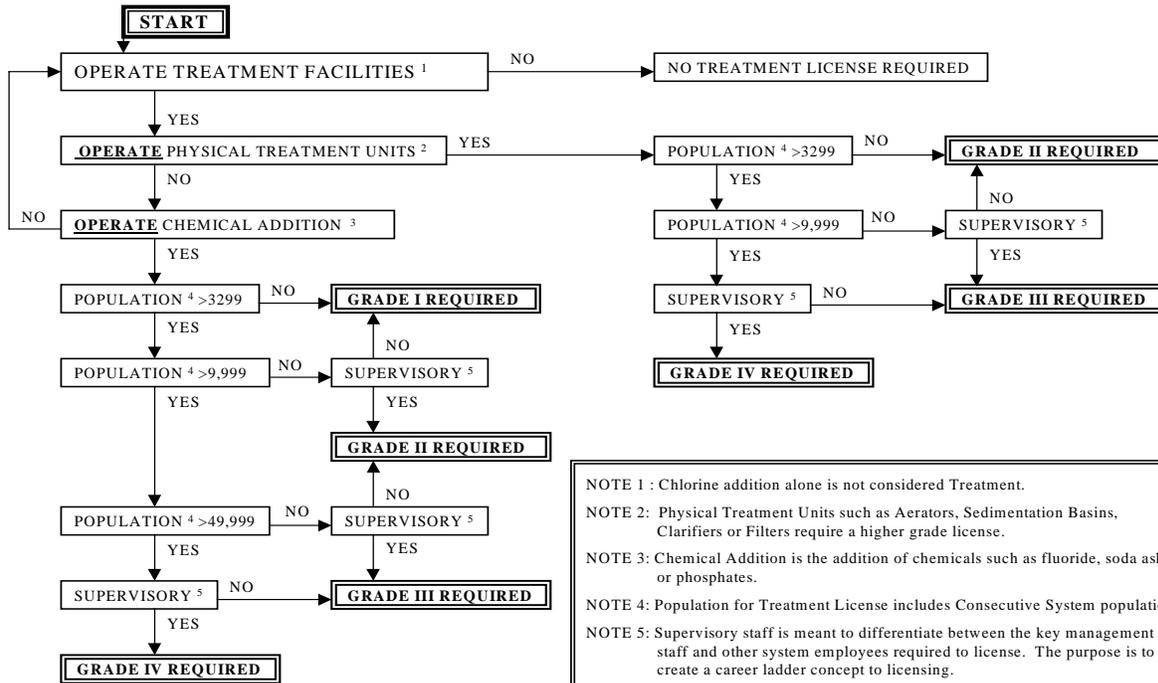
The preceding Rules & Regulations have been filed in my office and are hereby adopted on the \_\_\_\_\_ day of \_\_\_\_\_, AD two thousand and two.

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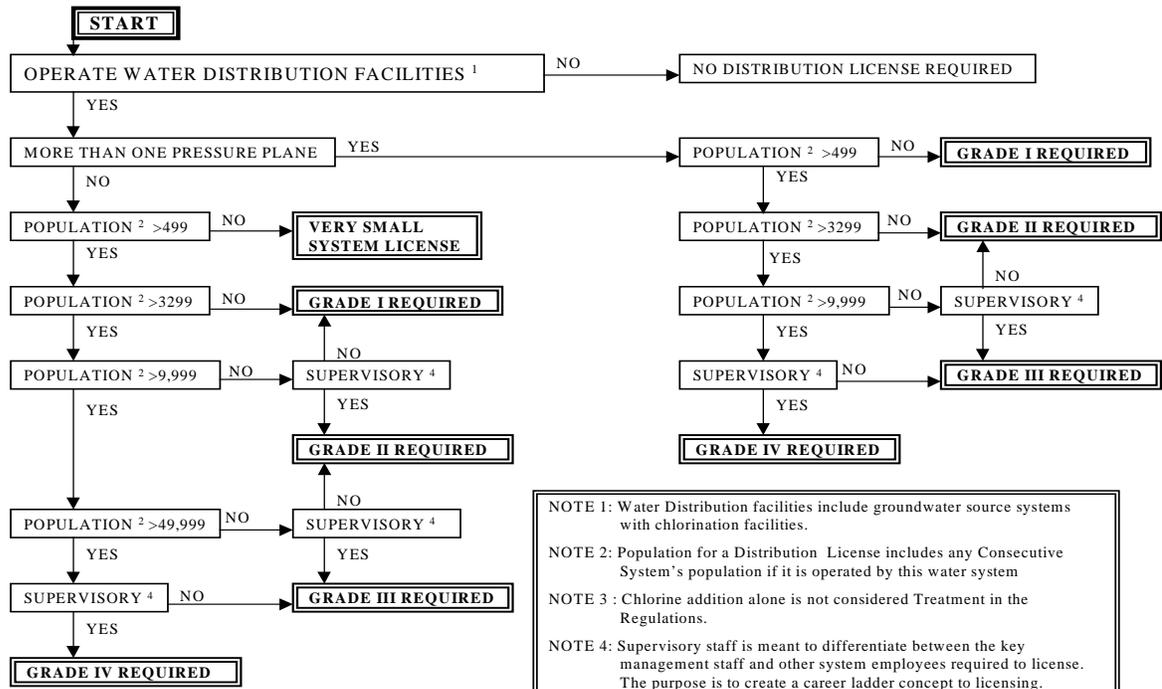
Mike Huckabee  
GOVERNOR

(Attachment 1)

TREATMENT LICENSE GRADE REQUIRED



DISTRIBUTION LICENSE GRADE REQUIRED



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## **APPENDIX E – EMERGENCY PLANNING**

### **THE EMERGENCY PLANNING PROCESS**

The emergency planning process is described in the following section. Some of the items listed under each step may not be applicable to your water system or there may be other items that you need to add.

#### **STEP 1 - ESTABLISH A PLANNING TEAM**

- Form the Team
- Establish Authority
- Issue a Mission Statement
- Establish a Schedule and Budget

#### **STEP 2 - ANALYZE CAPABILITIES AND HAZARDS**

- Where Do You Stand Right Now?
- Review Internal Plans and Policies
- Meet with Outside Groups
- Identify Codes and Regulations
- Identify Critical Products, Services and Operations
- Identify Internal Resources and Capabilities
- Identify External Resources
- Conduct a Vulnerability Analysis
- List Potential Emergencies
- Estimate Probability
- Assess the Potential Human Impact
- Assess the Potential Property Impact
- Assess the Potential Business Impact
- Assess Internal and External Resources

#### **STEP 3 - DEVELOP THE PLAN**

- Plan Components
- Emergency Management Elements
- Emergency Response Procedures
- Support Documents
- The Development Process
- Identify Challenges and Prioritize Activities
- Write the Plan
- Establish a Training Schedule
- Continue to Coordinate with Outside Organizations
- Maintain Contact with other Corporate Offices
- Review, Conduct Training and Revise
- Seek Final Approval
- Distribute the Plan

#### **STEP 4 - IMPLEMENT THE PLAN**

- Integrate the Plan into Company Operations
- Conduct Training
- Planning Considerations
- Training Activities
- Employee Training
- Evaluate and Modify the Plan

### **HAZARD SPECIFIC INFORMATION**

This section lists common hazards that your emergency plan should specifically address. All of these emergencies could affect your water system, although the impact of a Hurricane will probably be less than the impact of the Hurricane on a water system located in a coastal area. For each of these items, your emergency plan should include a page or section for response to that item.

- Life Safety
- Fire
- Hazardous Materials Incidents
- Floods and Flash floods
- Hurricanes
- Tornadoes
- Severe Winter Storms
- Earthquakes
- Technological Emergencies
- Terrorist Attacks / Vandalism
- Failure of major equipment
- Loss of electrical power
- Contamination of the water system

**HAZARDOUS SUBSTANCES**

This part contains a partial listing of “Extremely Hazardous Substances” from the list maintained by U.S. EPA’s Chemical Emergency Preparedness and Prevention office. This sub-listing is of chemicals commonly used by public water systems. If your water system stores or uses these chemicals in excess of the poundage shown, your water system most likely is a “**facility**” and has to meet emergency planning and reporting requirements under SARA Title III. Note that since gaseous chlorine normally comes in 150 pound or 2000 pound cylinders, water systems using gaseous chlorine are probably affected.

<u>NAME</u>	<u>TPQ, pounds</u>	<u>EHS RQ, pounds</u>
Ammonia	500	100
Chlorine	100	10
Ozone	100	100

TPQ = Threshold Planning Quantity

EHS RQ = Extremely Hazardous Substances, Reporting Quantity

**INFORMATION SOURCES**

Most of parts of this section are taken from publications of the Federal Emergency Management Agency (FEMA). Contact information for FEMA and other information sources are listed below:

FEMA Headquarters  
 Federal Emergency Management Agency  
 500 C Street SW  
 Washington, DC 20472  
 (202) 646-2500

FEMA Region VI Offices  
 Denton, TX  
 (817) 898-5104

USEPA  
 Mail Code 5101  
 401 M Street SW  
 Washington, DC 20460  
 (202) 260-0030

USEPA  
 Region VI  
 1445 Ross Avenue  
 Dallas, TX  
 (214) 665-2283

(214) 665-8338

Federal Bureau of Investigation  
Little Rock Field Office  
Two Financial Center, Suite 200  
10825 Financial Centre Parkway  
Little Rock, Arkansas 72211  
(501) 221-9100

U.S. Department of Labor  
Occupational Safety and Health Administration  
425 West Capitol  
Little Rock, Arkansas  
(501) 324-6256

Hazardous Materials Spills or Pipeline Leaks  
National Response Center 24 hours a day  
(800) 424-8802

Arkansas Department of Emergency Management  
P. O. Box 758  
Conway, Arkansas 72032  
(Previously known as the Office of Emergency Services)  
(501) 329-5601

**Arkansas Department of Health Numbers are Listed Below:**

Arkansas Department of Health  
(501) 661-2000  
(800) 462-0599  
After Hours Emergency (800) 554-5738

Engineering Section  
(501) 661-2623  
(800) 462-0599

Radiation Control and Emergency Management  
(501) 661-2301

Division of Epidemiology  
(501) 661-2893

Division of Emergency Medical Services  
(501) 661-2262

**OTHER RESOURCES**

County Judge's Office  
County Department of Emergency Management  
Department of Health, Local Health Unit  
Local Hospitals  
The Red Cross  
Local Law Enforcement  
Local Utilities

## **PUBLICATIONS**

AWWA M19 Emergency planning for Water Utility Management

AWWA Minimizing Earthquake Damage, A Guide for Water Utilities

FEMA Emergency Management Guide for Business and Industry

**APPENDIX F – MODEL EMERGENCY PLAN (SMALL SYSTEMS)**

**EMERGENCY ACTION PLAN AND PROCEDURES**

\_\_\_\_\_ Waterworks

PWS # \_\_\_\_\_

**STREET** \_\_\_\_\_.  
**TELEPHONE** \_\_\_\_\_.  
**CITY/STATE** \_\_\_\_\_.  
**FAX** \_\_\_\_\_.

**PURPOSE AND OBJECTIVE**

The purpose of this emergency plan is to develop the capability to deliver water to our customers under emergency conditions. The objective of this plan is to minimize the effects of natural or caused disasters on the water system. Prior planning and training will allow the water utility to respond in a more efficient and timely manner to emergency situations in order to maintain a quality water at a sufficient quantity. It is to that end that this emergency plan is developed.

This emergency plan should be updated annually to meet the changing needs and requirements of the water system. In addition, emergency equipment (i.e. generators, etc.) should be checked to verify it is in working order on a routine schedule.

This emergency plan was last updated on \_\_\_\_\_.

**RESPONSIBILITIES AND CHAIN-OF-COMMAND**

If a disaster occurs during regular business hours, all utility personnel will be utilized in areas of need, and whenever possible, all employees are expected to stay at their work stations unless instructed otherwise.

If a disaster occurs outside of regular business hours, employees should, when possible, report for their regularly scheduled work shift, unless called back to work before then.

If a disaster occurs outside of regular business hours, and the disaster is of such magnitude in the Association that the phone communications with the water system manager or emergency contact person cannot be established, all employees of the \_\_\_\_\_ Waterworks should report to the office at \_\_\_\_\_ (Location, Address, City, State).

**PERSONS TO NOTIFY**

Notify the following individuals of the emergency situation as soon as possible following the emergency. The persons are listed below in order of CHAIN-OF-COMMAND.

- 1. **UTILITIES DIRECTOR** \_\_\_\_\_  
OFFICE PHONE NUMBER \_\_\_\_\_  
HOME PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY NUMBER \_\_\_\_\_

- 2. **WATER SUPERINTENDENT** \_\_\_\_\_  
 OFFICE PHONE NUMBER \_\_\_\_\_  
 HOME PHONE NUMBER \_\_\_\_\_  
 24 HOUR EMERGENCY NUMBER \_\_\_\_\_
  
- 3. **DISTRIBUTION AND MAINTENANCE DIRECTOR** \_\_\_\_\_  
 OFFICE PHONE NUMBER \_\_\_\_\_  
 HOME PHONE NUMBER \_\_\_\_\_  
 24 HOUR EMERGENCY NUMBER \_\_\_\_\_
  
- 4. **CHIEF WATER TREATMENT PLANT OPERATOR** \_\_\_\_\_  
 OFFICE PHONE NUMBER \_\_\_\_\_  
 HOME PHONE NUMBER \_\_\_\_\_  
 24 HOUR EMERGENCY NUMBER \_\_\_\_\_
  
- 5. **WATER TREATMENT PLANT OPERATOR** \_\_\_\_\_  
 OFFICE PHONE NUMBER \_\_\_\_\_  
 HOME PHONE NUMBER \_\_\_\_\_  
 24 HOUR EMERGENCY NUMBER \_\_\_\_\_
  
- 6. **SEWER TREATMENT PLANT OPERATOR** \_\_\_\_\_  
 OFFICE PHONE NUMBER \_\_\_\_\_  
 HOME PHONE NUMBER \_\_\_\_\_  
 24 HOUR EMERGENCY NUMBER \_\_\_\_\_
  
- 7. **OFFICE MANAGER** \_\_\_\_\_  
 OFFICE PHONE NUMBER \_\_\_\_\_  
 HOME PHONE NUMBER \_\_\_\_\_  
 24 HOUR EMERGENCY NUMBER \_\_\_\_\_
  
- 8. **WATER ASSOCIATION BOARD PRESIDENT** \_\_\_\_\_  
 OFFICE PHONE NUMBER \_\_\_\_\_  
 HOME PHONE NUMBER \_\_\_\_\_  
 24 HOUR EMERGENCY NUMBER \_\_\_\_\_

**EMERGENCY PHONE NUMBERS**

The following list of telephone numbers are provided for quick reference in the event of a major emergency.  
POST THESE EMERGENCY NUMBERS NEAR TELEPHONES FOR QUICK REFERENCE.

ARKANSAS DEPARTMENT OF HEALTH (EMERGENCY/AFTER HOURS)	1-501-661-2623	1-800-554-5738
OFFICE OF EMERGENCY SERVICES		
ARKANSAS ONE CALL	1-800-482-8998	
ARKANSAS STATE POLICE		
COUNTY SHERIFF'S DEPARTMENT		
CITY POLICE DEPARTMENT		
CITY FIRE DEPARTMENT		
HOSPITAL NAME		
PHONE NUMBER		

24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

ELECTRIC COMPANY \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

GAS COMPANY \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

TELEPHONE COMPANY \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

RADIO STATION \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

TELEVISION STATION \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

NEWSPAPER COMPANY \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

As soon as possible, the water system ( \_\_\_\_\_ Manager \_\_\_\_\_ or other designated person/s) should notify all consecutive systems to which water is sold of the emergency situation and advise them of what steps are being taken to deal with the emergency.

Consecutive System \_\_\_\_\_ Operator \_\_\_\_\_ Office/Home Phone \_\_\_\_\_  
Consecutive System \_\_\_\_\_ Operator \_\_\_\_\_ Office/Home Phone \_\_\_\_\_

**RESPONSES TO EMERGENCIES**

IN THE EVENT OF AN EMERGENCY:

1. Assess the situation. Determine what type of emergency exists.
2. Try to remain CALM.
3. Follow the instructions in the emergency plan and contact the necessary personnel listed in RESPONSIBILITIES AND CHAIN-OF-COMMAND.

The first step in responding to an emergency situation is making an assessment of the situation. An accurate assessment requires accurate and complete information. The Manager or Designated person/s of the \_\_\_\_\_ Waterworks, will advise you of what areas of the water system to assess. Damage to one component of the system may affect other components of the system as well. Therefore, be as complete and concise as you can when evaluating damage to the water system. Dependent on the magnitude of the disaster, be prepared to respond to customer calls as soon as possible.

In event of an emergency which results in the inability of the water system to provide water service to a large segment area for a prolonged period of time, water points will be established to provide water for essential human needs. These water points will be established by:

1. Connection 2-inch steel pipe headers with multiple faucets to fire hydrants at locations where the distribution system remains pressurized. If possible, sterilize before use.

2. Locating water trailers at various locations throughout areas where service is not available. Preferable locations for water points are at or near fire stations so firemen could provide some supervision and control. If necessary, water personnel will be assigned to man the trailers.

The following persons will be responsible for establishing water distribution points and installing pipe headers with multiple faucets where needed.

NAME \_\_\_\_\_ NAME \_\_\_\_\_  
 NAME \_\_\_\_\_ NAME \_\_\_\_\_

Water trailers will be obtained from:

COMPANY/MILITARY UNIT \_\_\_\_\_  
 CONTACT PERSON \_\_\_\_\_  
 WORK PHONE \_\_\_\_\_ HOME PHONE \_\_\_\_\_  
 24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

COMPANY/MILITARY UNIT \_\_\_\_\_  
 CONTACT PERSON \_\_\_\_\_  
 WORK PHONE \_\_\_\_\_ HOME PHONE \_\_\_\_\_  
 24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

**TERRORIST ACTS OR INTENTIONAL CONTAMINATION OF WATER SUPPLY BY POINSONS OR TOXIC AGENTS AND HAZARDOUS CHEMICAL SPILLS.**

**TAKE ALL TERRORISTIC ACTS SERIOUSLY.**

Terroristic acts are usually reported by telephone. The receiver of such calls should get as much information from the caller as possible. In case of a hazardous chemical spill, follow the same procedures. Every attempt should be made to get the following information:

1. Has the poison or agent already been placed in the system?
2. What kind of contaminant was used or proposed to be used?
3. Where was the material introduced into the system.?
4. How much of the material was used?
5. When was the material applied?
6. How was the material applied?
7. Who is the caller and where do they live?
8. What organization does the caller represent and how can he/she be contacted?

If the contaminant has been introduced into the raw water supply:

1. Immediately shut off the raw water pumps.
2. Shut off all pumps and components of the water treatment plant. Isolate water treatment plant from distribution system.
3. Notify the person in charge (Utility Director/Water Manager or Designated person/s) as soon as possible of the threat/Terroristic activity. He/She will immediately notify the following people or will assign someone to make notifications:
  - a. The news media is to issue an order to not consume and/or use water due to the possibility of contaminants being present in the water. Hold press conference and issue news releases so those customers in the affected areas will be notified to not consume and/or use the water until further notice.
  - b. Call the Arkansas Department of Health , Engineering Section, at 1-501-661-2623 or 1-800-554-5738 (after hours/weekends). Tell them as much information as you have on the

contaminant which has been introduced in to the water supply. Give Department personnel a telephone number where they can contact the Manager or Operator on duty.

- c. The Poison Information Center in Little Rock will determine adverse health effects of the contaminant.
  - d. State Office of Emergency Services.
  - e. Local and State Police.
4. Be prepared to collect samples and transport them to the Arkansas Department of Health (ADH) for analysis. If analysis indicates there is no contaminant present, the ADH will lift the NO WATER consumption order.

If laboratory tests indicate positive results:

- a. Notify the media to advise customers in the affected areas to continue to not consume and/or use the water.
- b. Flush the sample distribution system until negative results are obtained.
- c. Increase chlorine concentrations in the distribution system.

If the contaminant has been introduced into the distribution system follow steps 3 and 4.  
In addition:

1. Immediately isolate the facility where the contaminant was reported to have been introduced.
2. Isolate storage tanks. Close critical distribution system valves to isolate segments of the system to minimized contaminants spread throughout the distribution system.
3. Open fire hydrants to flush contaminants out of the water mains.

**DO NOT ALLOW** customers to consume water from the system until the Arkansas Department of Health has determined the water is safe for human consumption again.

### MAJOR TRANSMISSION LINE LEAKS OR BREAKS

1. Isolate the damaged pipeline section through valving, and maintain service to the rest of the water system.
2. If necessary, shut off pumps and valve off storage tanks that feed water to areas where there are major line breaks to conserve water until repairs can be completed.
3. If any portion of the system suffers negative pressure and/or lack of pressure on the distribution system, notify the Arkansas Department of Health and the County Sanitarian. A BOILING WATER ORDER will be issued to the public and the news media. See Appendix A for Boil Water Order procedures.
4. Restore water to hospital and critical care facilities as soon as possible.
5. Repair main breaks as soon as possible. If amounts of unaccounted for water becomes excessive, continue to look for breaks in the distribution system.

6. If supplies are needed above those available at the time emergency, a list of suppliers is located in Appendix C. Contact the supplier and inform him of the emergency situation to expedite shipment of new supplies.
7. A list of local contractors and plumbing companies is attached in Appendix D in the event that water system employees are unable to respond to the emergency due to the extent of the emergency or personal injury. The Utility Manager \_\_\_\_\_ or Designated person/s \_\_\_\_\_ will be responsible for contracting with these companies for services in an emergency.

**POWER OUTAGE/MAJOR ELECTRICAL PROBLEMS**

1. Determine what part/s of the water distribution system are affected by the outage. Contact the Electric Company of the area affected, as listed under EMERGENCY NUMBERS, immediately so that power can be restored as soon as possible. Determine the length of time the failure will exist.
  - a. If sufficient water supply exists in the storage tanks to adequately cover the period of power outage, no other action will be necessary.
  - b. If the expected repair time exceeds water storage supply estimates, immediately notify the persons listed in the CHAIN-OF –COMMAND at the beginning of this document.
2. Start auxiliary generator as soon as possible if one is available. If the water department does not have an emergency generator, a portable generator will be made available to the water department through:

COMPANY/MILITARY UNIT \_\_\_\_\_  
 CONTACT PERSON \_\_\_\_\_  
 WORK PHONE \_\_\_\_\_ HOME PHONE \_\_\_\_\_  
 24 HOURS EMERGENCY PHONE NUMBER \_\_\_\_\_

Following instructions in the operational manual for starting and connecting the generator to pumping facilities

3. Monitor the water levels in storage tanks. If there is a loss of pressure or negative water pressure occurs in any part of the system, contact the Arkansas Department of Health . A BOIL WATER ORDER will be issued immediately for the affected areas of the distribution system. See Appendix A for Boil Water Order Procedures.
4. Issue a CONSERVATION OF WATER ORDER through the news media and by direct notification to large industrial water users.
5. If an extended outage occurs, establish water distribution points from water trailers. Notify the news media of locations of water distribution points for citizen’s use.
6. If a major equipment electrical problem exists (i.e. raw water pump, high service pump, or critical booster pump) assess the water treatment plants ability to continue operation using the remaining equipment. If the plant is unable to continue operation at adequate water supply levels, follow instructions above.
7. Call the following contractors to make major electrical repairs for the water system:

COMPANY NAME \_\_\_\_\_  
 CONTACT PERSON \_\_\_\_\_  
 WORK PHONE \_\_\_\_\_ HOME PHONE \_\_\_\_\_  
 24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

## INTERRUPTED TELEPHONE SERVICE

1. If a telemetering problem occurs immediately, contact the persons in the CHAIN-OF-COMMAND at the beginning of this document.
2. If the telemetering problem cannot be fixed by system personnel immediately contact the following repair services:

COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
WORK PHONE \_\_\_\_\_ HOME PHONE \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
WORK PHONE \_\_\_\_\_ HOME PHONE \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_

3. Monitor water levels in storage tanks and manually control the water level if necessary until the telemetering system is repaired.
4. Monitor water pressure in the distribution system. If at any time, the water pressure falls below 20-psi contact the Arkansas Department of Health . A BOIL WATER ORDER will be issued for the area of the system which has experienced low water pressure. See Appendix A for procedures for Boil Water Orders. Remember only the Arkansas Department of Health can lift Boil Water Orders.

## CHLORINE LEAKS AND CHLORINE EQUIPMENT FAILURE

Any chlorine leak is **extremely dangerous and maximum caution** should be used when repairing chlorine leaks. Use only SELF-CONTAINED BREATHING APPARATUSES when repairing chlorine leaks. Do not use canister-type-breathing masks.

For minor chlorine leaks:

1. Immediately determine the location of the leak. Then call the persons in the CHAIN-OF-COMMAND and notify them of the leak. Do not attempt to fix the leak until at least two persons are present.
2. Turn on floor level exhaust fan to vent chlorine gas from the room before entering.
3. One of the two persons should enter the leak location with a SCBA on. The second person should watch from a safe distance with a SCBA unit ready in case the first person requires assistance.
4. Turn valve on leaking tank off. Determine location of leak on cylinder or Chlorinator assembly.
5. When gases have been evacuated from chlorination room, proceed to fix the leak, replacing gaskets, lines, and/or valves as necessary to repair a leak. After repairing the leak, check for additional leaks before putting unit back in service via use of an ammonia bottle or a rag soaked with 26% ammonia.

In the event of a major chlorine leak additional steps should be taken:

1. Immediately evacuate all personnel by first moving at right angles to the wind direction.

2. Call the Utility Director \_\_\_\_\_ or Designated person/s \_\_\_\_\_ and state that there is a Major Chlorine Leak at \_\_\_\_\_ (site). Request that chlorine leak personnel be dispatched to the site of the leak.
3. If a major chlorine leak occurs which requires evacuation, contact the Utility Director or Designated person/s \_\_\_\_\_ and should contact the departments and agencies listed in the EMERGENCY PHONE NUMBERS section of this document. Advise them on the radius of the area that requires evacuation. In addition, all schools, hospitals, and industries in the evacuation zone should be contacted directly.
4. Only trained personnel wearing SCBA operated in the positive pressure mode should be permitted in the area.
5. Determine source of leak. Rotate leaks in cylinders and ton containers upward so only gaseous chlorine escapes.
6. Install Emergency capping kit appropriate for cylinder container that is leaking. Kit includes step-by-step instructions and tools.

**DAMAGED PUMP STATIONS**

1. Determine which pump stations contain damaged pumps. Prioritize order in which pump would be repaired based on areas of distribution system which contain critical water users such as hospitals and nursing homes and areas containing water storage facilities.
2. If possible reroute water so that the distribution system will remain pressurized while pump repairs are made. This may only involve engaging an auxiliary pump in the pump station or may involve transferring from one part of the system to another where they are interconnected.
3. If total pump failure occurs at stations where there is no interconnection to supply water low water pressure or loss of water pressure may occur. If water pressure falls below 20 psi, contact the Arkansas Department of Health (ADH). A BOIL WATER ORDER will be issued for the area of the system affected. See Appendix A for Boil Water Order Procedures. Remember only the Arkansas Department of Health can lift Boil Water Orders.
4. If pump repairs are expected to take more than two days arrange to establish emergency water stations in the areas without water. See Appendix for pump information and suppliers.

**STRUCTURAL DAMAGE**

Structural damage to a water treatment facility will be caused by earthquakes or explosions.

1. Assess structural damage throughout the water system as soon as possible following any disaster. Notify the Utility Director \_\_\_\_\_ or Designated person/s \_\_\_\_\_ structural damage assessment.
2. Prioritize repair of all damaged structures including water treatment facilities, pump station buildings, and storage facilities. Do not enter buildings that appear to have severe structural problems and might be in danger of collapsing.
3. If an elevated storage tank appears to be threatened and supports are undermined or weakened, shut off the control valve and drain the tank.



damaged. Prioritize thawing and/or repair of these lines. Thaw and/or repair impacting critical care facilities first.

2. Keep the water flowing in the distribution system whenever possible to prevent further freezing of lines. If this is not possible isolate areas with frozen and/or damaged mains (i.e. leaking or broken mains).
3. Be prepared to respond to customers with meters that have frozen and broken.
4. If a loss of pressure occurs in any areas(s) of the distribution system, contact the Arkansas Department of Health . A BOIL WATER ORDER will be issued for the affected area(s) of the water system. See Boil Water Order Procedures.

### **CHEMICAL OUTAGE**

If the water treatment plant runs out of a critical chemical for any reason or if the chemicals are unavailable from the primary supplier follow the steps listed below to avoid an emergency. See chemical inventory and suppliers section.

1. Contact the closest water treatment facility to this one and see if chemicals can be procured from them until shipment arrives or a new supplier can be procured.
2. Determine when the water treatment facility will be able to get delivery of chemicals. If the chemicals will be unavailable for an extended period of time, contact the Arkansas Department of Health to determine if other chemicals can be temporarily substituted.
3. Some form of chlorine must be fed at all times. If unchlorinated water enters the system contact, the Arkansas Department of Health immediately and a BOIL WATER ORDER will be issued. See Boil Water Order Procedures.

### **LACK OF PERSONNEL**

During a period in which there is a shortage of personnel, construction and maintenance activities can be suspended to reduce the manpower requirements dramatically. Cross-train personnel so that they can work several different job positions in emergency situations.

City managers and other designated persons should be trained to operate the water treatment facility in the event of a strike by utility employees.

### **MUTUAL AID AGREEMENTS**

Initiate mutual aid agreements and other cooperative agreements.

1. Provide agreements with related utility, service and civil defense agencies.
2. Define and assign responsibilities in emergencies.
3. Provide for exchange or assignment of personnel, equipment and materials.
4. Provide for coordination of communications, training, reconnaissance, assessment, inventory taking, etc.
5. Consider legal problems.

6. Plan to provide interconnections with adjacent systems.

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<b>BOIL WATER ORDER PROCEDURE</b>
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1. If the possibility exists that unchlorinated or contaminated water enters the water distribution system, a BOIL WATER ORDER will be issued for the part of the system affected. This situation may occur under the following circumstances:
  - a. There is a loss of pressure in the distribution system or negative pressure in the distribution system.
  - b. There is a failure of the chlorination system and unchlorinated water enters the distribution system.
2. Immediately contact the Arkansas Department of Health , Engineering Section at 1-501-661-2623 or at 1-800-554-5738 (AFTER HOURS/WEEKENDS). The Arkansas Department of Health will issue/confirm the BOIL WATER ORDER.
3. Contact the local news media (radio stations, television stations, and newspapers) as soon as possible to advise them of the BOIL WATER ORDER and the area(s) of the system are affected by the order. Refer to EMERGENCY PHONE NUMBERS in the front of this emergency plan for media telephone numbers.
4. In the event of a line break, when line pressure has been reestablished disinfect the line. Then submit bacteriological samples collected in the affected part of the system to the Arkansas Department of Health . When it is determined that the water samples are coliform bacteria free the Arkansas Department of Health will lift the Boil Water Order.
5. In the event of loss of chlorination facilities, repair or replace the defective equipment as soon as possible. If there is adequate water storage, shut down the water treatment plant until chlorination is restored to minimize the chance that unchlorinated water will enter the distribution system.
6. Contact the local news media and advise them when the Boil Water Order has been lifted by the Arkansas Department of Health .
7. Increase the chlorine residual to approximately 2 PPM until bacteriological samples have been determined to be coliform negative. Flush mains in the affected areas as a precautionary measure.

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## WATER SYSTEM MAPS

In this section include water treatment plant schematic drawings which indicate where critical controls and valves are located. In addition, indicate which chemicals are stored in which areas and where they are used in day-to-day operations. For instance if chlorine cylinders are stored in a separate room from the Chlorinator and injection system, clearly mark it on the schematic so that someone unfamiliar with the plant (i.e. fireman or emergency worker) would know where all chlorine cylinders were located for their own safety. The same would be applicable for critical controls and valves.

Include distribution maps that indicate the locations of critical valves in the distribution system with reference to fixed objects. Indicate which valves isolate which areas of the distribution.

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<b>CHEMICAL INVENTORY</b>
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CHEMICAL \_\_\_\_\_  
CHEMICAL USE \_\_\_\_\_  
POINT OF ENTRY \_\_\_\_\_  
FEEDER TYPE \_\_\_\_\_  
LOCATION OF STORAGE AREA \_\_\_\_\_  
FORM OF CHEMICAL:    GAS                    POWDER                    LIQUID  
AVERAGE AMOUNT MAINTAINED AT PLANT \_\_\_\_\_  
SUPPLIER \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
SUPPLIER PHONE NUMBER \_\_\_\_\_

CHEMICAL \_\_\_\_\_  
CHEMICAL USE \_\_\_\_\_  
POINT OF ENTRY \_\_\_\_\_  
FEEDER TYPE \_\_\_\_\_  
LOCATION OF STORAGE AREA \_\_\_\_\_  
FORM OF CHEMICAL:    GAS                    POWDER                    LIQUID  
AVERAGE AMOUNT MAINTAINED AT PLANT \_\_\_\_\_  
SUPPLIER \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
SUPPLIER PHONE NUMBER \_\_\_\_\_

CHEMICAL \_\_\_\_\_  
CHEMICAL USE \_\_\_\_\_  
POINT OF ENTRY \_\_\_\_\_  
FEEDER TYPE \_\_\_\_\_  
LOCATION OF STORAGE AREA \_\_\_\_\_  
FORM OF CHEMICAL:    GAS                    POWDER                    LIQUID  
AVERAGE AMOUNT MAINTAINED AT PLANT \_\_\_\_\_  
SUPPLIER \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
SUPPLIER PHONE NUMBER \_\_\_\_\_

CHEMICAL \_\_\_\_\_  
CHEMICAL USE \_\_\_\_\_  
POINT OF ENTRY \_\_\_\_\_  
FEEDER TYPE \_\_\_\_\_  
LOCATION OF STORAGE AREA \_\_\_\_\_  
FORM OF CHEMICAL:    GAS                    POWDER                    LIQUID  
AVERAGE AMOUNT MAINTAINED AT PLANT \_\_\_\_\_  
SUPPLIER \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
SUPPLIER PHONE NUMBER \_\_\_\_\_

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**CRITICAL CARE FACILITIES**

HOSPITAL \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_

HOSPITAL \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_

CRITICAL CARE FACILITY \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_

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**CONTRACTORS**

COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
WORK PHONE NUMBER \_\_\_\_\_  
HOME PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_  
SERVICE OR EQUIPMENT AND SUPPLIES \_\_\_\_\_

COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
WORK PHONE NUMBER \_\_\_\_\_  
HOME PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_  
SERVICE OR EQUIPMENT AND SUPPLIES \_\_\_\_\_

COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
WORK PHONE NUMBER \_\_\_\_\_  
HOME PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_  
SERVICE OR EQUIPMENT AND SUPPLIES \_\_\_\_\_

**ELECTRONIC AND TELEMETRY COMPANIES**

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COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
WORK PHONE NUMBER \_\_\_\_\_  
HOME PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_  
SERVICE OR EQUIPMENT AND SUPPLIES \_\_\_\_\_

COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
WORK PHONE NUMBER \_\_\_\_\_  
HOME PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_  
SERVICE OR EQUIPMENT AND SUPPLIES \_\_\_\_\_

**EQUIPMENT RENTAL COMPANIES**

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COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
WORK PHONE NUMBER \_\_\_\_\_  
HOME PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_  
SERVICE OR EQUIPMENT AND SUPPLIES \_\_\_\_\_

COMPANY NAME \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
WORK PHONE NUMBER \_\_\_\_\_  
HOME PHONE NUMBER \_\_\_\_\_  
24 HOUR EMERGENCY PHONE NUMBER \_\_\_\_\_  
SERVICE OR EQUIPMENT AND SUPPLIES \_\_\_\_\_