GROUND WATER RULE

ADH Compliance Short School

The GROUND WATER RULE (GWR) Overview

- Applies to all Public Water Systems (PWS) serving ground water
- Wholesale systems supplying ground water
- Consecutive systems buying ground water
- Mixed systems using both ground water and surface water not combined
- Does not apply to systems who combine all their ground water with surface water (or groundwater under the influence of surface water) prior to treatment meeting Subpart H (Surface Water Treatment Rule)

The GROUND WATER RULE (GWR)
Overview

Purpose:

Provides an additional barrier from microbial contamination and from pathogens entering drinking water by correcting deficiencies identified in the sanitary survey

Examples: well defects, sources of contamination, water treatment plant (WTP) defects

GWR COMPONENTS

1. Triggered Monitoring (triggered by total coliform positive (TCP) distribution sample collected as part of routine monitoring)
2. Compliance Monitoring
3. Sanitary Surveys
4. Corrective Action Plan
5. Source Water Assessment Monitoring (State option)

GWR COMPLIANCE STRATEGIES

- Triggered source water monitoring
- Compliance Monitoring - Treatment to 4 log (99.99%) inactivation and/or removal of viruses OR

Most water system in Arkansas comply with the Ground Water Rule by performing triggered source water sampling when a positive coliform sample result is obtained during routine monthly monitoring. A small number of water systems comply through ensuring and documenting adequacy of the disinfection process (4 log viral removal/inactivation).

TRIGGERED MONITORING

- **Triggered by a TCP Routine sample under the Revised Total Coliform Rule (RTCR).**
  - **1 sample from each source collected within 24 hours of notification**
  - **Applies to wholesale & purchase systems, too.**
- **Applies to all GWR systems that do not provide 4-log inactivation or removal of viruses.**

TRIGGERED MONITORING

- If a purchase system gets a TCP, it must notify the source system so that they will be aware of the possible need to perform source water sampling per federal regulations.
- However, in Arkansas, most purchase systems have master meters that are far enough from the source system treatment that 4-log virus inactivation has occurred if there is a chlorine residual. This would negate the need for source sampling.
- The ADH will confirm with the source system, if source water sampling is required.

TRIGGERED MONITORING

- Consecutive systems (purchase systems)
  - Must advise source system of routine bacteriological positive sample (TCP)
  - Must record chlorine residual on bacteriological sample collection form
  - Must provide public notice if source system has a treatment technique or monitoring violation

TRIGGERED MONITORING

- As long as you record your chlorine residual on your bacti sample collection form and on your monthly Bacteriological Monitoring Record (BMR) the source system will likely not be required to collect triggered (raw) water samples from their wells. The ADH will make that decision.

- Distribution systems have been evaluated to determine if the State established criteria has been met.

- If the chlorine residual has not been recorded on the bacti sample collection form or is not present then the source system will be required to collect source water samples.

Arkansas Department of Health

4815 West Markham Street • Little Rock, Arkansas 72205-3867 • Telephone (501) 661-2000
Governor Mike Beebe
Paul K. Halverson, DrPH, FACHE, Director and State Health Officer

Engineering Section, Slot H37 Ph 501-661-2623 Fax 501-661-2032
www.HealthyArkansas.com/eng/ After Hours Emergency 501-661-2136

Monday, December 07, 2009

ANYTOWN WATERWORKS PWS# 999
JOHN SMITH
1905 VIRUS WAY
ANYTOWN, AR 72990

Example Report:
Routine Distribution TC+ Result –
Triggers Collection of Raw Sample(s)

RE: GWR Triggered Monitoring

Dear: JOHN SMITH

Your system or a public water system which purchases water from you has had either a total coliform positive result on one or more of the routine monthly distribution system samples collected for compliance with the TCR, or your system has had an E. coli positive raw water sample (see results below).

The **Ground Water Rule** requires that you collect at least one raw water sample either on the combined raw water line *prior to treatment* at each water treatment plant or from each of your well(s) that were in operation on the date the TCR compliance sample(s) was collected. This notice approves you to monitor at either location. Additionally, if source sample(s) are E. coli positive, additional source monitoring will be required.

0 BOTTLE(S) ARE BEING SENT TO YOU FOR GROUNDWATER SOURCE SAMPLING

System Name: ANYTOWN WATERWORKS

Lab No.	Site	Site Address	County	Collected	Time	Received	Time	Collected By
1014307	999B001	ANYTOWN GENERAL STORE 1212 H2O St.	ARKA	12022009	0800	12032009	0742	J SMITH

Specimen code WEL **Purpose** REG **Category** PUB **Rejection**

Result: P TOTAL COLIFORMS **Present**
EA E. coli **Absent**

Comments:

Chlorine Residual: 0.3

Actions to Take: The sample above has triggered source water monitoring for your system. You must collect a single sample from either a raw water tap on the combined raw water header prior to treatment at each of your water treatment plants or a single sample from a raw water tap at each of your wells that were in operation on the day that the above distribution sample was collected.

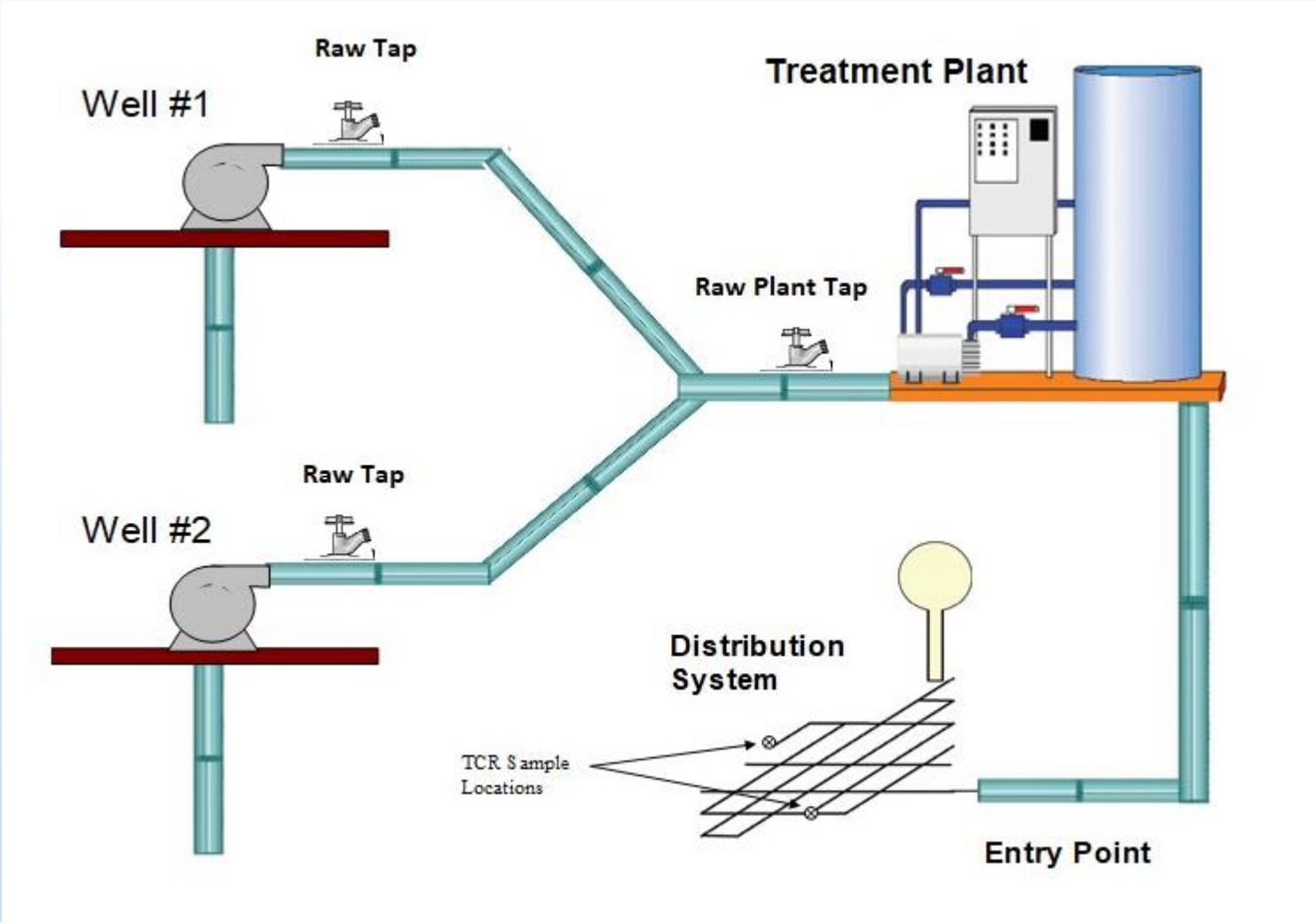
The sample(s) must be collected within 24 hours of receiving this notice.

Select the Site Code and Sample Location from the list of your treatment plant(s) and well(s) below: Enter in the "Site Code" box and "Definite Location of Sample" box on the bacti report form **exactly** as shown.

	Site Code	Location		Site Code	Location
WTP:	99901	WTP #1 (DOWNTOWN)	WELL:	999101	WELL #10A
WTP:			WELL:	999102	WELL #11
WTP:			WELL:	999103	WELL #12A
WTP:			WELL:	999104	WELL #15
WTP:	99902	WTP #2 (MT HOLLY)	WELL:	999201	WELL #17
WTP:			WELL:	999202	WELL #18
WTP:			WELL:	999203	WELL #19
WTP:			WELL:	999204	WELL #20
WTP:	99903	WTP #3 (MORNING STAR)	WELL:	999301	WELL #16 MORNIIG STAR

TRIGGERED MONITORING

	SITE CODE	LOCATION		SITE CODE	LOCATION
WTP:	99901	WTP #1 DOWNTOWN	WELL:	999101	WELL #10A
				999102	WELL #11
				999103	WELL #12A
				999104	WELL #15
	99902	WTP #2 MOUNT HOLLY		999201	WELL #17



IF BOTH WELLS WERE PRODUCING ON DAY OF TCP TAKE FROM COMBINED TAP

IF ONLY ONE WELL PRODUCING ON DAY OF TCP TAKE FROM THAT RAW TAP

ENTRY POINT ON GRAPHIC IS COMPLIANCE MONITORING SAMPLE LOCATION (FIRST CUSTOMER)

TRIGGERED MONITORING

- **If a triggered source water sample is positive for *E. coli*, the State will require the system to:**
    - **Collect 5 additional raw water samples from the well(s) within 24 hours of receiving notification of the positive result.**
    - **If the *E. coli* positive sample is from the combined raw water line prior to treatment, then collect additional raw water samples from each well that was in service at the time the TCR monitoring was conducted.**

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Engineering Section, Slot H37 Ph 501-661-2623 Fax 501-661-2032
www.HealthyArkansas.com/eng/ After Hours Emergency 501-661-2136

Monday, December 14, 2009

ANYTOWN WATERWORKS
JOHN SMITH
1905 VIRUS WAY
ANYTOWN, AR 72990

PWS# 999

Example Report:
Triggered Raw Sample - E. coli + Result
Requires Collection of Additional Raw Samples

RE: GWR Triggered Monitoring

Dear: JOHN SMITH

Your system or a public water system which purchases water from you has had either a total coliform positive result on one or more of the routine monthly distribution system samples collected for compliance with the TCR, or your system has had an E. coli positive raw water sample (see results below).

The **Ground Water Rule** requires that you collect at least one raw water sample either on the combined raw water line *prior to treatment* at each water treatment plant or from each of your well(s) that were in operation on the date the TCR compliance sample(s) was collected. This notice approves you to monitor at either location. Additionally, if source sample(s) are E. coli positive, additional source monitoring will be required.

8 BOTTLE(S) ARE BEING SENT TO YOU FOR GROUNDWATER SOURCE SAMPLING

System Name: ANYTOWN WATERWORKS

Lab No.	Site	Site Address	County	Collected	Time	Received	Time	Collected By
1014948	99901	WHS #1 (DOWNTOWN)	ARKA	12092009	0845	12102009	0752	J SMITH

Specimen code: WEL Purpose: RWE Category: PUB Relection:

Result: P TOTAL COLIFORMS Present
EP E. COLI Present

Comments:

Chlorine Residual: 0.0

Actions to Take: The above raw water sample was E. coli positive. You must conduct additional monitoring at each well represented by this sample. If **one** well is represented by this sample, collect 5 additional raw water samples from that well; if **2** wells are represented collect at least 3 samples from each well; if **3 or 4** wells are represented collect at least 2 samples from each well; and if **5 or more** wells are represented collect at least 1 sample from each well.

Monitoring must be conducted at the raw water tap on the well(s) within **24 hours** of receiving this notice.

Select the Site Code and Sample Location from the list of your treatment plant(s) and well(s) below: Enter in the "Site Code" box and "Definite Location of Sample" box on the bacti report form **exactly** as shown.

	Site Code	Location		Site Code	Location
WTP:	99901	WTP #1 (DOWNTOWN)	WELL:	A999101	WELL #10A
WTP:			WELL:	A999102	WELL #11
WTP:			WELL:	A999103	WELL #12A
WTP:			WELL:	A999104	WELL #15
WTP:	99902	WTP #2 (MT HOLLY)	WELL:	A999201	WELL #17
WTP:			WELL:	A999202	WELL #18
WTP:			WELL:	A999203	WELL #19
WTP:			WELL:	A999204	WELL #20
WTP:	99903	WTP #3 (MORNING STAR)	WELL:	A999301	WELL #16 MORNIIG STAR

TRIGGERED MONITORING

- If a system has one well, 5 raw samples are required
- 2 wells – 3 samples each
- 3 or 4 wells – 2 samples each
- 5 wells or more – 1 sample each

BACTERIOLOGICAL FORM

ARKANSAS DEPARTMENT OF HEALTH
Public Health Laboratory, 201 South Monroe Street
Little Rock, AR 72205-5425

WATER ANALYSIS-BACTERIOLOGICAL

LABORATORY USE ONLY
DO NOT WRITE IN THIS SPACE →

Sample Shipped Via (Laboratory Use Only)

Laboratory Number (Laboratory Use Only)

Date and Time Received (Laboratory Use Only)

SECTION 1 – Date and Time Sample Collected (Required)

MONTH	DAY	YEAR	HOUR (Must Check Box)
			Exact Time _____ ☐ AM ☐ PM

SECTION 2 – Public, Non-Community and Semi-Public System Use Only

Water System Name	Water System ID Number (Required)		Site Code
			Xxx101
Definite Location of Sample	City	County	Collected By:
Well 1			

SECTION 3 – Private Submitters, ADH, Local Health Units Only

Definite Location of Sample		Collected By:
City	County	Note: $17.00 Fee Per Sample ☐ Credit on File, No Fee Included

Send Report To:
Name _____
Address _____
City/State/Zip _____

HL-01 (R 04/17)

SECTION 4 – Sample Type
☐ Public Community ☐ Non-community ☐ Semi-Public
☐ Private - $17 Fee REQUIRED

SECTION 5 – Source
☒ Well ☐ Surface ☐ Cistern ☐ Spring

SECTION 6 – Purpose
☐ Boil Order ☐ Special/Investigation ☐ New Construction
☒ Raw Water ☐ Raw Water with Count
☐ Regular Distribution Sample
Resample Type: ☐ Repeat
Original Lab # ☐ Replacement
Required ☒ Triggered Raw
Original Lab # _____
Chlorine Residual _____ (circle one) Free or Total

ENVIRONMENTAL HEALTH SPECIALIST ONLY
☐ Swim Beach ☐ Investigation

LABORATORY USE ONLY
Rejection/Disclaimer Code_____ Initials_____
Analyst Notes:

TRIGGERED MONITORING

- Correct information on forms is important to receive credit for collecting the raw sample
- These are issues experienced by our Staff:
- Incorrect site code – correct sites are at the bottom of your notice
- Incorrect "Definite Location of Sample" – listed at bottom of your notice
- "Collected by" not filled in
- Failing to include "Original Lab Number"

PUBLIC WATER SYSTEM - BACTERIOLOGICAL MONITORING RECORD

Arkansas Department of Health / Engineering Section

PUBLIC WATER SYSTEM NAME **AnyTown Waterworks** PWS ID #

MONTH **December** YEAR **2009** COUNTY

DATE	SAMPLE SITE #	TYPE -- REGULAR OR RESAMPLE	CL2 RESIDUAL (MG/L)	LAB RESULTS	LAB #	ORIGINAL LAB # (Of Triggering Sample)	DAY/DATE RESULTS RECEIVED
12/1/2009	999B007	regular	0.5	A	1014304		12/4/2009
12/1/2009	999B006	regular	0.5	A	1014305		12/4/2009
12/1/2009	999B003	regular	0.5	A	1014306		12/4/2009
12/4/2009	999B007	regular	0.2	P/ EA	1014307		12/6/2009
12/4/2009	999B003	regular	0.5	A	1014308		12/6/2009
12/10/2009	999B005	Resample	0.5	A	1014859	1014307	12/9/2009
12/10/2009	999B007	Resample	0.5	A	1014860	1014307	12/9/2009
12/10/2009	999B007	Resample	0.5	A	1014861	1014307	12/9/2009
12/10/2009	99901	Triggered	0	A	1014862	1014307	12/9/2009
12/10/2009	99902	Triggered	0	A	1014863	1014307	12/9/2009
12/15/2009	999B007	regular	0.5	A	2034667		12/22/2009
12/16/2009	999B003	regular	0.5	A	2034668		12/22/2009
12/17/2009	999B005	regular	0.5	A	2034669		12/22/2009
12/18/2009	999B004	regular	0.5	A	2034670		12/22/2009
12/19/2009	999B001	regular	0.5	P/EA	2034671		12/22/2009
12/23/2009	999B007	Resample	0.5	A	3351332	2034671	12/26/2009
12/23/2009	999B001	Resample	0.5	A	3351333	2034671	12/26/2009
12/23/2009	999B002	Resample	0.5	A	3351334	2034671	12/26/2009
12/23/2009	999B003	Resample	0.5	A	3351335	2034671	12/26/2009
12/23/2009	99901	Triggered	0.5	A	3351336	2034671	12/26/2009
12/23/2009	99902	Triggered	0.5	P/EP	3351337	2034671	12/26/2009
12/27/2009	999201	Additional	0.5	A		3351337	12/30/2009
12/27/2009	999201	Additional	0.5	A		3351337	12/30/2009
12/27/2009	999201	Additional	0.5	A		3351337	12/30/2009
12/27/2009	999202	Additional	0.5	A		3351337	12/30/2009
12/27/2009	999202	Additional	0.5	A		3351337	12/30/2009
12/27/2009	999202	Additional	0.5	A		3351337	12/30/2009

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

Printed Nam_____ Signature _____

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

TRIGGERED MONITORING

- **E. coli positive result from source water sampling, provide Tier 1 Public Notice within 24 hours of notification.**
  - **Applies to wholesale and purchase**
  - **Media broadcasting, hand delivery, public locations, official websites**
- **E. coli positive, collect additional samples or take corrective action.**
  - **Samples must be collected within 24 hours of notification.**
- **If the resample E. coli pos – PWS MUST take corrective action. (consult w/ State w/in 30 days)**

COMPLIANCE MONITORING
Treatment for 4-Log Viral Removal/Inactivation

- Although considered a “corrective action”, treatment and documentation of treatment to 4-log viral removal/inactivation is an option that will avoid the requirement to sample source water in the event of a total coliform result from RTCR monitoring.
- However, if this option is chosen by the water system or required by the state, then any failure to adequately treat, monitor, or document adequate treatment can result in a treatment technique violation and required public notice.

COMPLIANCE MONITORING

Treatment for 4-Log Viral Removal/Inactivation

Monitoring requirements

- > 3,300 pop. monitor continuously
- ≤ 3,300 pop. monitor daily
- State assigned residual disinfection concentration
- State approved location

COMPLIANCE MONITORING

> 3,300 people served

- **Continuously monitor residual disinfectant concentration and record its *lowest reading* each day**
- **If equipment fails: grab samples every 4 hours until return to service**
- **System must resume continuous monitoring within 14 days (repair or replace continuous monitor)**

COMPLIANCE MONITORING

≤ 3,300 people served

- Collect grab sample during the hour of peak flow or other state-specified time each operating day
- If daily grab sample falls below the specified minimum residual, follow-up samples must be taken every 4 hours until the residual is returned to the state-determined minimum level.
- May monitor and record continuously – record lowest reading

DATE	Previous Meter Reading		Hours Plant Run	Rainfall (in)	Temperature F or C		Lbs. Chemical Used (List Chemicals)						pH			TURBIDITY (NTU)			ODOR		ALKALINITY (ppm)			HARDNESS (ppm)		Fluoride (ppm)	Sampling Point: Entry point to distribution system		GWR CT		FILTER OPERATION			
	Master Meter Reading (gal)	Total Treated x1000 gal			Air	Water							Raw	Settled	Finished	Raw	Settled	Finished	Raw	Finished	Raw	Settled	Finished	Raw	Settled		Cl2 (free) Residual (mg/l) AM	Cl2 (free) Residual (mg/l) PM	GWR CT Conditions within limits below? Y / N	CT Compliance Met? Y / N	NUMBER USED	HOURS OPERATED	WASHED FILTER NUMBER(s)	WASH WATER USED x1000 gal
1																																
2																											0.4		Y	YES				
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10																																
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29																																
30																																
31																																
Total																																
Average																											0.4					
Maximum																											0.4					
Minimum																											0.4					

COMMENTS:

GWR CT Conditions

Maximum pH =<9
Minimum Temp >=14 C
Plant/Well Flow =<2000 gpm
High Service Flow =<3800 gpm
Clearwell Depth >=7 FT

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 # _____

Make a copy for your records & return by the 10th of the following month to the above address.

LGW - 2009

Sampling Point		GWR CT	
Disinfectant Residual (mg/l)		Flow rate, pH and Temp. within limits?	CT Compliance Met?
AM	PM	Y / N	Y / N
0.4		Y	YES

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

Public Water System Name & Entry Point	ID #	County	Month	Year

Previous Meter Reading			Chemicals Applied						Disinfectant Residual & CT		
			Chlorine						Sample Location	Flow rate(s), pH and Temperature within limits below?	GWR
Master Meter Reading (gal)	Date	Thousands of Gallons Treated	Pounds Used	mg/L	Pounds Used	mg/L	Pounds Used	mg/L	Residual (mg/l)		CT Compliance Met?
	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
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	28										
	29										
	30										
	31										
TOTAL											
AVG											
MAX											
MIN											

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 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 (Slot-37), 4815 West Markham, Little Rock AR 72205-3867

SGW-15

ASSESSMENT MONITORING

- If directed by the State, GWSs shall conduct Assessment monitoring.
- Assessment monitoring generally consists of monthly source samples for a period of 12 months.
- Required for all new wells.

SANITARY SURVEYS

- Every 3 years for groundwater systems; 2 years for surface systems
- Evaluate the elements
    - Source
    - Treatment
    - Distribution system
    - Finished water storage
    - Pumps, pump facilities, and controls
    - Monitoring, reporting, and data verification
    - System management & operation
- Identify significant deficiencies
    - Requires special notice to the public
        - Including fecal contamination of source water

GWR Violations – Tier 1

- **E. coli positive result from source water sampling, provide Tier 1 Public Notice within 24 hours of notification.**
  - **Applies to wholesale and purchase**
  - **Media broadcasting, hand delivery, public locations, official websites**

GWR Violations – Tier 2

Treatment Technique Violations -- Public Notice

- GWS that does not maintain 4 log virus removal at or before the first customer.
- Significant deficiency found during sanitary survey is not corrected w/in 120 days, interim measures not met or schedule not followed.
- Failure to consult w/ State w/in 30 days of notification.
- Corrective Action Plan (CAP) not completed w/in 120 days, interim measures not met or schedule not followed after fecal indicator + source sample(s)

GWR Violations – Tier 3

- **Monitoring Violations -- Public Notice**
  - **Failure to conduct triggered source water monitoring or to demonstrate compliance w/ 4-log virus inactivation by monitoring and reporting. (failure to submit operations reports)**
  - **Failure to conduct source water *E. Coli* monitoring.**
    Failure to notify other PWS of TCP trigger or *E. Coli* source.
  - **Positive source water sample – Tier 1 Public Notice required w/in 24 hours.**
  - **Failure to conduct source assessment monitoring for new sources.**

Corrective Action Plan

- If a significant deficiency is identified during the sanitary survey.

- E. coli detected in the source water or repeat samples.

Corrective Action Plan

- Corrective actions include:
  - Correct all significant deficiencies
  - Provide alternate source of water
  - Eliminate source of contamination
  - 4-log inactivation and/or removal of viruses

Corrective Action Plan

- System has 30 days to consult with State and devise an appropriate plan. State may have specific plan and schedule to follow.

- Corrective Action must take place within 120 days, or be in compliance, with state approved corrective action plan.


An example of inadequate well construction that leaves the well vulnerable to contamination.

An example of a properly constructed well.

UNDERSTANDING CT

- Federal regulations contain values for minimum chlorine contact time with drinking water to ensure that 4-log viral removal/inactivation has occurred.
- This is called “CT”, “chlorine contact time”.
- The state will evaluate well water disinfection applications and award the “contact time” that can be used in calculating CT
- These issues are relevant for systems that using treatment for 4-log viral removal/inactivation as a way of complying with the GWR.

UNDERSTANDING CT

Calculating CT

CT = C x T

C = concentration of disinfectant residual (mg/L)

- For systems using chlorine, C can be measured with: portable or continuous monitor using an EPA-approved method.
- C must be measured before or at first customer

T = contact time (minutes)

- between point of application of disinfectant & point where disinfectant residual is measured usually entry point to system
- Based on system components – volume of water from application point to entry point

Calculation:

$$\frac{\text{capacity (gal) of system component (pipe, storage tank)}}{\text{system flow (gpm)}}$$

- CT is expressed as (mg-min)/L

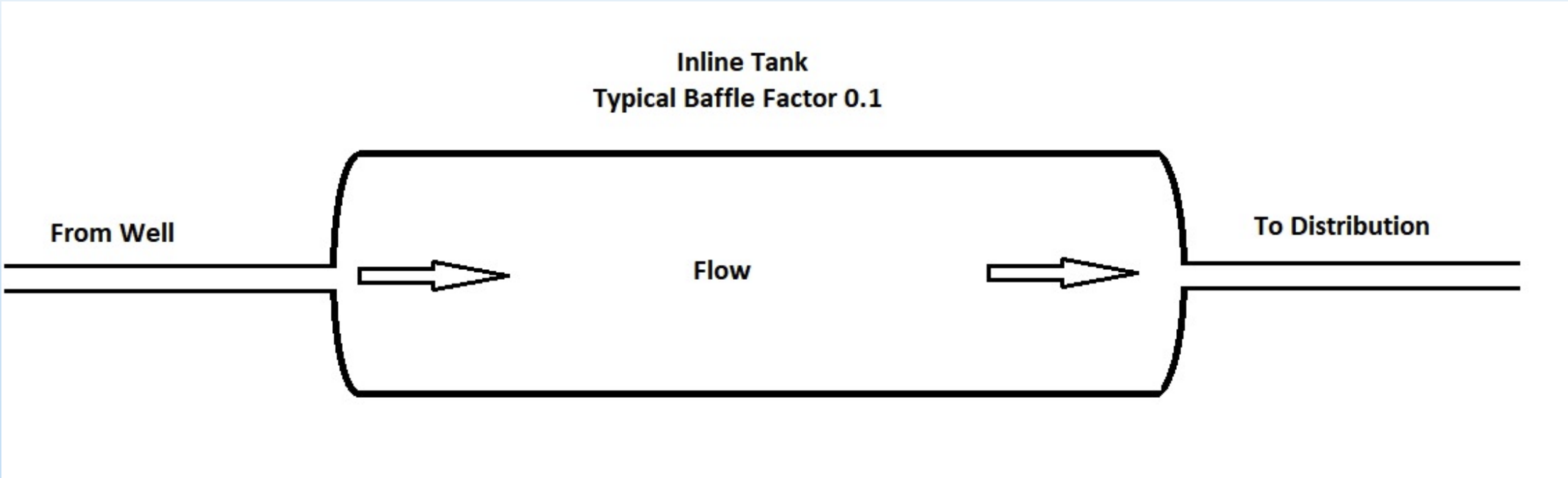
UNDERSTANDING CONTACT TIME

BAFFLE FACTORS

- Baffle factors in clear wells add “credit” to your CT.
- Baffles force the flow of water to utilize more of the tank or basin volume thus increasing CT.
- Must be an applicable baffle factor.
- The next 3 slides show types of tanks than are commonly used with ground water systems and shows the beneficial effect of baffles.

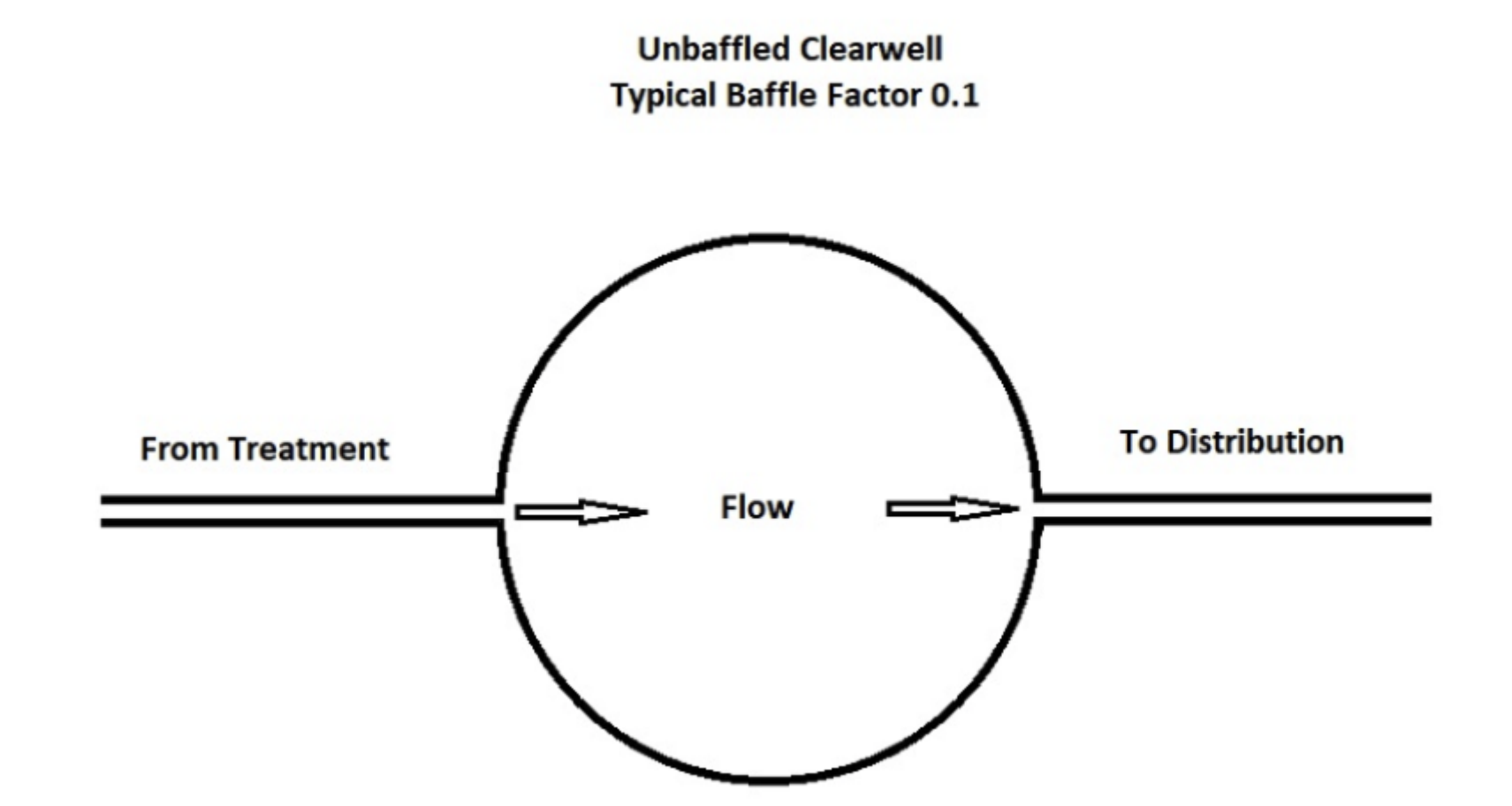
UNDERSTANDING CONTACT TIME

BAFFLE FACTORS



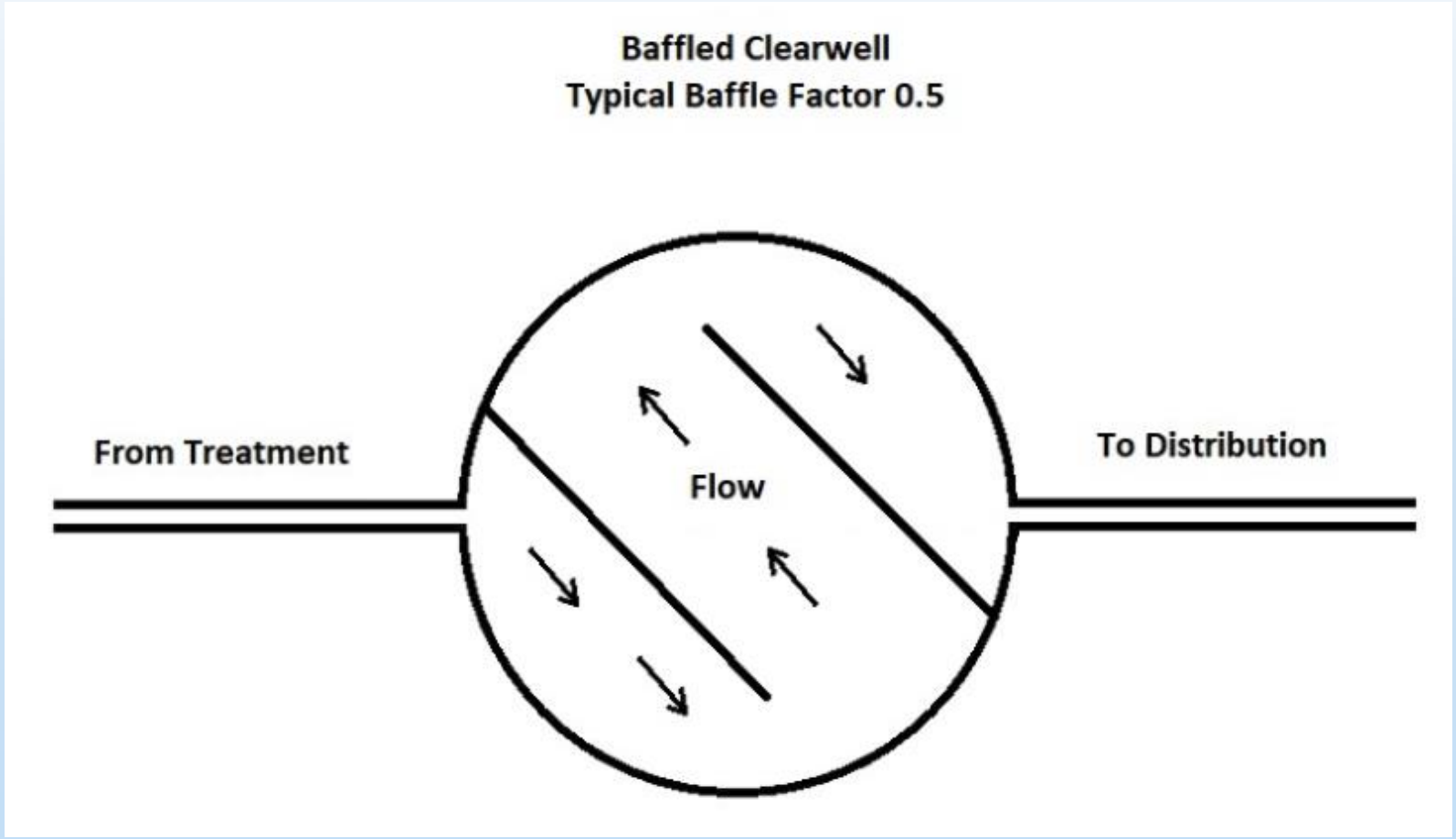
UNDERSTANDING CONTACT TIME

BAFFLE FACTORS



UNDERSTANDING CONTACT TIME

BAFFLE FACTORS



Required CT Values

CT VALUES* FOR
4- LOG INACTIVATION OF VIRUSES BY FREE CHLORINE

	pH	
Temperature (°C)	6-9	10
0.5	12	90
5	8	60
10	6	45
15	4	30
20	3	22
25	2	15

*Although units did not appear in the original tables, units are min-mg/L.

RECORDKEEPING

- Documentation of corrective actions - 10 years.
- Documentation of public notice - 3 years.
- Records of minimum residual - 10 years.
- Record of lowest residual and date and duration of any failure to maintain min residual for a period of more than 4 hours- 5 years.

REVIEW QUESTION

- Who is affected by the Ground Water Rule (GWR)

- A – All systems
- B – Ground water systems
- C – Small Systems
- D – Large systems

ANSWER

- B Ground water systems only

REVIEW QUESTION

- What is purpose of GWR?

- A – Annoy water operators with additional sampling requirements
- B – Give the lab more work
- C – Provide an additional barrier against pathogens

ANSWER

- C – Provide an additional barrier against pathogens

REVIEW QUESTION

How is Compliance Monitoring conducted?

A – Continuous monitoring of disinfectant residual
B – Grab samples of disinfectant residual
C – Only conducted by systems >3300
D – Only conducted by systems <3300

ANSWER

A – Continuous monitoring of disinfectant residual

AND

B – Grab samples of disinfectant residual

REVIEW QUESTION

- When will a triggered (raw) sample be required?

- A – Every month
- B – Once a year
- C – When a routine RTCR sample results in a total coliform positive

ANSWER

- C – When a routine RTCR sample results in a total coliform positive

REVIEW QUESTION

- How many samples are required for a triggered sample?

- A – Depends on the number of wells in use that day
- B – One sample per well
- C – 5 samples per well

ANSWER

- A – Depends on the number of wells in use that day
- The other answers are somewhat correct but A is the best answer

REVIEW QUESTION

- E. coli is identified in the triggered sample. How many samples are required?

- A – Depends on the number of well in use that day
- B – None
- C – 5 samples per well

ANSWER

- A – Depends on the number of well in use that day
- C - Is correct if the system has only one well

Questions?

- **Questions or Comments?**

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