

Arkansas Department of Health

Engineering Section, Operator Licensing Program

presents the course

Public Water System Compliance

**Monitoring and
Bacteriological Sampling**



The Safe Drinking Water Act requires all public water systems to collect and analyze samples for the presence of certain microbiological, bacteriological and chemical contaminants including inorganic and organic compounds.



Safe Drinking Water Act (SDWA) Requirements

- Each water utility has full responsibility for collecting and analyzing all compliance samples.
- The ADH Engineering Section and Laboratory make every effort to help PWSs meet monitoring compliance.
- All systems must be familiar with their monitoring requirements & schedules.



Monitoring-Record Keeping Requirements

| | |
|---|--------------|
| Action to correct violations, Public Notices..... | 3 years |
| Bacteriological Monitoring Record..... | 5 years |
| Consumer Confidence Reports..... | 3 years |
| Variances and exemptions..... | 5 years |
| Written reports, sanitary surveys, etc..... | 10 years |
| Treatment Operation Reports..... | 10 years |
| Chemical Analysis Reports..... | 10 years |
| Lead and Copper Rule Reports..... | 12 years |
| Optimal Corrosion Control Records..... | Indefinitely |
| Blueprints, Maps, Plans, Easements..... | Indefinitely |



National Primary Drinking Water Regulations

- Each public water system must take routine samples from the distribution system for microbiological analysis for coliform bacteria.
- The basis for the old 1989 TCR is the testing for coliform bacteria in the drinking water systems.
- The new 2013 RTCR basis is to place more emphasis on correcting sanitary deficiencies that contribute to coliform bacteria in the distribution system and a higher emphasis when E-Coli is detected.

Sample Site Plans

- Routine compliance samples and repeat or replacement samples (resamples) 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 ADH Engineering Section. Systems should regularly review their site plans and submit updates/revisions as needed. (Service area expansions, inactive sites, population changes, etc.)



Why Is A Site Plan Required?

- To ensure your samples are representative of the distribution system.
- A plan documents sampling sites for reference.
- A site plan facilitates planning in case of contamination.
- Required by the Regulation.



Sample Site Plan Contents

- An overall plan, sketch, drawing, map of the entire distribution system.
- Layout of distribution system lines (mains, laterals, tanks, etc.).
- Points of identification.



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SAMPLING SITE PLAN

SITE IDENTIFICATION FORM

Anytown Waterworks 001
PUBLIC WATER SYSTEM NAME **ID #**

| SITE NUMBER <u>1</u> | PWS ID # | SITE # | LOCATION (STREET ADDRESS) |
|----------------------|--------------|--------------|------------------------------------|
| REGULAR SAMPLE | <u>001 B</u> | <u>001</u> | <u>500 Main St</u> |
| REGULAR RESAMPLE | <u>001 B</u> | <u>001 A</u> | <u>***** (SAME AS ABOVE) *****</u> |
| DOWNSTREAM RESAMPLE | <u>001 B</u> | <u>001 B</u> | <u>600 Main St</u> |
| UPSTREAM RESAMPLE | <u>001 B</u> | <u>001 C</u> | <u>400 Main St</u> |
| ALTERNATE RESAMPLE | <u>001 B</u> | <u>001 D</u> | <u>550 Main St</u> |

| SITE NUMBER <u>2</u> | PWS ID # | SITE # | LOCATION (STREET ADDRESS) |
|----------------------|-------------|--------------|------------------------------------|
| REGULAR SAMPLE | <u>001B</u> | <u>002</u> | <u>300 Peach St</u> |
| REGULAR RESAMPLE | <u>001B</u> | <u>002 A</u> | <u>***** (SAME AS ABOVE) *****</u> |
| DOWNSTREAM RESAMPLE | <u>001B</u> | <u>002 B</u> | <u>400 Peach St</u> |
| UPSTREAM RESAMPLE | <u>001B</u> | <u>002 C</u> | <u>200 Peach St</u> |
| ALTERNATE RESAMPLE | <u>001B</u> | <u>002 D</u> | <u>250 Peach St</u> |

| SITE NUMBER <u>3</u> | PWS ID # | SITE # | LOCATION (STREET ADDRESS) |
|----------------------|-------------|--------------|------------------------------------|
| REGULAR SAMPLE | <u>001B</u> | <u>003</u> | <u>1201 My Lane</u> |
| REGULAR RESAMPLE | <u>001B</u> | <u>003 A</u> | <u>***** (SAME AS ABOVE) *****</u> |
| DOWNSTREAM RESAMPLE | <u>001B</u> | <u>003 B</u> | <u>1300 My Lane</u> |
| UPSTREAM RESAMPLE | <u>001B</u> | <u>003 C</u> | <u>1100 My Lane</u> |
| ALTERNATE RESAMPLE | <u>001B</u> | <u>003 D</u> | <u>1250 My Lane</u> |



Site Location Information

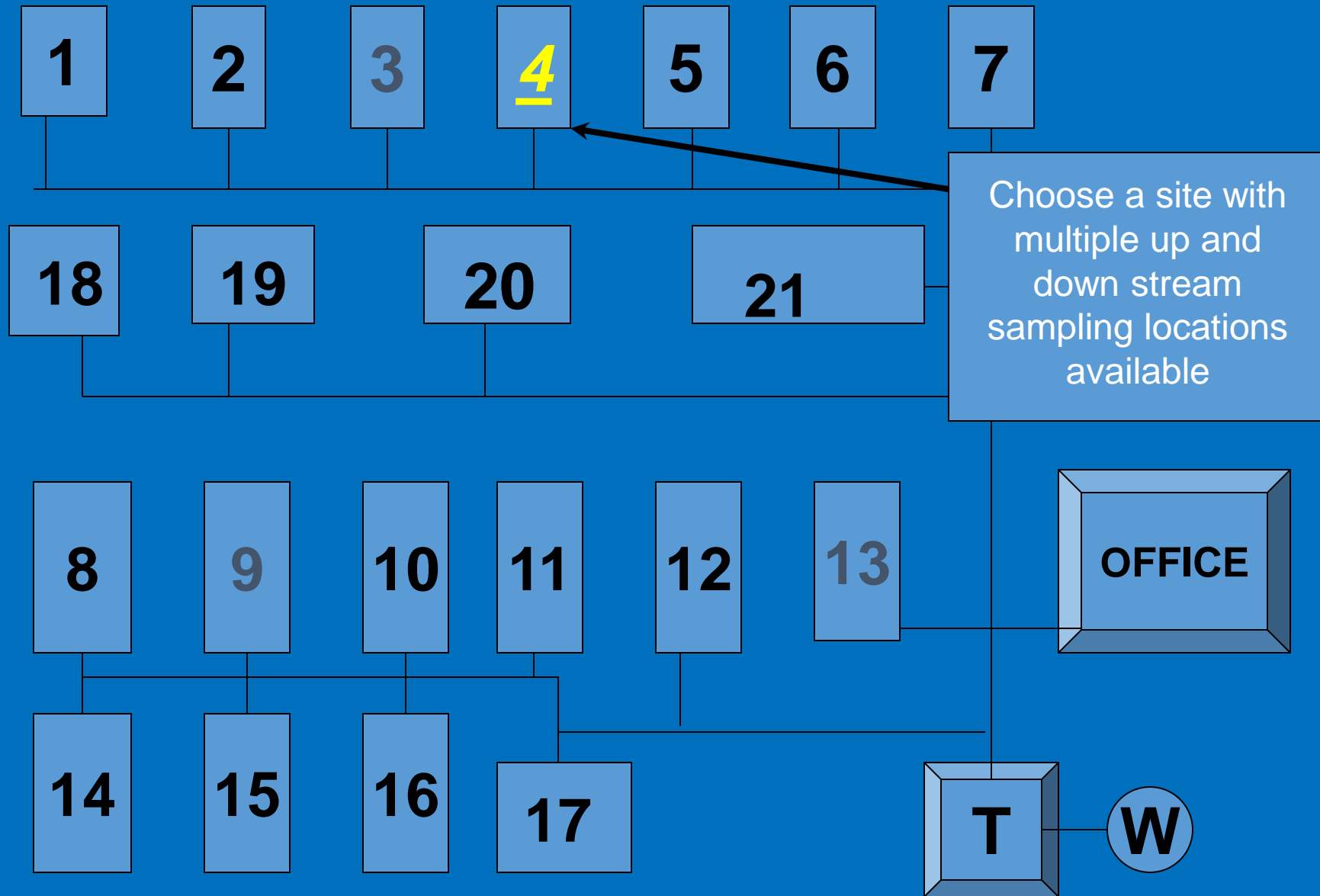
| SITE NUMBER <u>001</u> | PWS ID # | SITE # | LOCATION (STREET ADDRESS) |
|------------------------|----------|--------------|------------------------------------|
| REGULAR SAMPLE | <u>B</u> | <u>001</u> | <u>***** (SAME AS ABOVE) *****</u> |
| REGULAR RESAMPLE | <u>B</u> | <u>001 A</u> | <u>***** (SAME AS ABOVE) *****</u> |
| DOWNSTREAM RESAMPLE | <u>B</u> | <u>001 B</u> | <u>***** (SAME AS ABOVE) *****</u> |
| UPSTREAM RESAMPLE | <u>B</u> | <u>001 C</u> | <u>***** (SAME AS ABOVE) *****</u> |
| ALTERNATE RESAMPLE | <u>B</u> | <u>001 D</u> | <u>***** (SAME AS ABOVE) *****</u> |

Bac-T Site Plan

- Routine compliance samples (regular distribution samples) and repeat samples (resamples) must be collected according to the system's sampling site plan using site codes.
- Routine compliance samples and resamples without a site code may be rejected by the laboratory.



SITE B-4



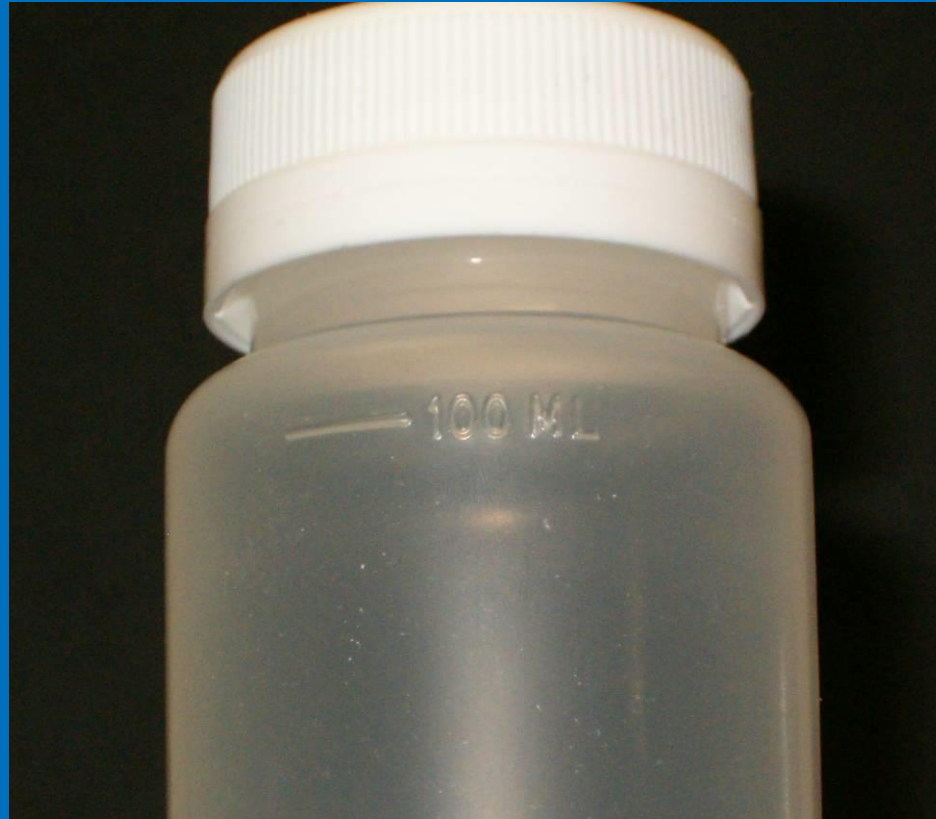
Bac-T Site Plan



- Sample sites cannot be moved after established.
 - Ex. Site B-1, 103 Elm Street is always B-1, 103 Elm Street.
- You can add as many sites as needed.
- All sites must be representative of the distribution system and approved by the ADH.



Sterilization Seal



BacT Sampling

- 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 sampling.

SODIUM THIOSULFATE



Check the Expiration Date



Sample Amount

- In order to be analyzed, the sample must contain a minimum of 100ml 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.

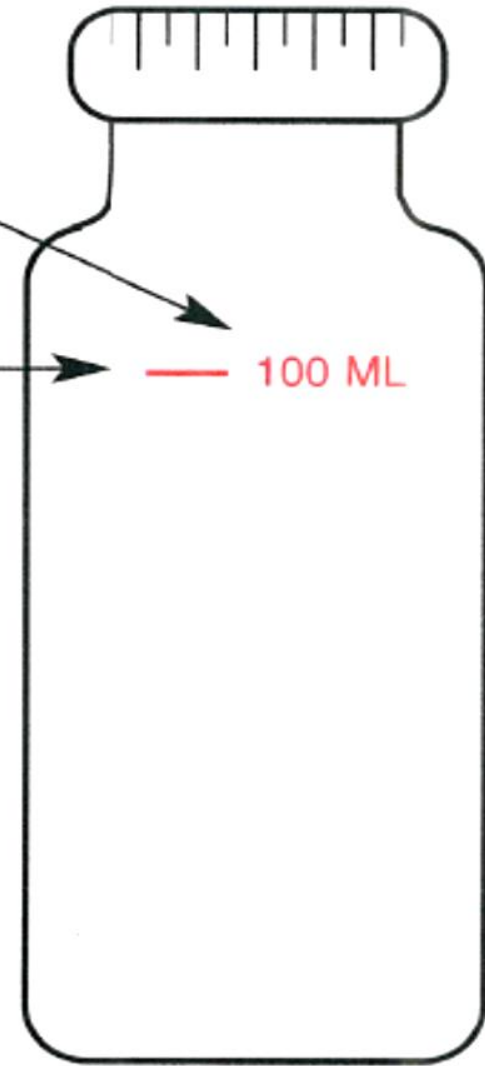
Indicator Mark





2.

1.



1. Water must be touching this line.

2. Water must not be above the 100 ml letters.

Responsibility

- Public Water Systems must submit samples monthly.
- Samples must be analyzed in a certified lab.



Responsibility

- Failure to receive sample bottles from the Department does not relieve you from required compliance sampling.
- You should contact your ADH District Staff if you experience sampling problems.



Bacteriological Monitoring

- The minimum number of samples to be submitted by a community or non-transient public water system in Arkansas is three (3) samples per month.
- Arkansas Regulations are more stringent than Federal Regulations.



HOW MANY?

The number of required samples to be submitted is determined by the system's population, but no less than 3 per month.



Bac-T Sampling Requirements

| Population | Min. # of Monthly Samples |
|---------------|---------------------------|
| 3,300 or less | 3 |
| 3,301-4,100 | 4 |
| 4,101-4,900 | 5 |
| 4,901-5,800 | 6 |
| 5,801-6,700 | 7 |
| 6,701-7,600 | 8 |
| 7,601-8,500 | 9 |
| 8,501-12,900 | 10 |
| 12,901-17,200 | 15 |
| 17,201-21,500 | 20 |
| 21,501-25,000 | 25 |
| 25,001 + | Contact ADH |

***For community and non-transient non-community PWS**



Split Monthly Sampling

Ground water systems with a population greater than 4,900 and surface water or surface water influenced systems that collect more than one (1) routine sample each month must split their sample collection into two or more sample periods per month. Preferably every two weeks.



Other Bac-T Sampling Requirements

New Construction

- Water Mains
- Treatment Facilities
- Storage Tanks

Two BacT samples obtained on consecutive days must pass before facilities can be placed into service.

Investigative (complaints, system function)

Boil Order



BACTERIOLOGICAL SAMPLING

- **Collecting The Sample**



When to collect samples?

***Systems are required to sample monthly**

- Sample according to your lab schedule
- Always use your site plan
- Make sure to label samples appropriately



Do not collect samples from:

- fire hydrants
- blowoffs
- yard hydrants with weep holes
- frost proof faucets
- or swivel type faucets

Collect samples from sites that are:

- used frequently
- sampling stations
- indoor sites, if practical
- non swivel type faucets

*** Avoid contamination from rain or wind blown dust**

The 5 Steps For Proper BacT Sampling



Step #1 : Flush



- Let the water rapidly flow long enough to flush out the lines and secure a representative fresh sample.
- We recommend two (2) minutes or **longer**.

STEP # 2

Check Chlorine Residual



STEP # 3

Decontaminate the Faucet



- Flame the faucet sufficiently to evaporate water.
- Don't flame plastic!

STEP # 4

Flush again



- Flush out the heated water.
- ADH recommends minimum of one (1) minute.
- Then slow the flow to a steady non-splashing stream.

STEP # 5 : Sample



- Hold the bottle at a slight angle and fill to the indicator mark.
- Avoid letting the water splash against the rim of the bottle, your hands, or near by objects.
- Do not let the bottle touch the faucet or any other object.

Dry the Bottle



- Check for 100 mL mark
- Replace the cap.
- After the cap is replaced wipe any moisture off the outside of the bottle and cap.

The Five Steps to proper BacT Sampling

1. Flush
2. Check Chlorine Residual
3. Flame
4. Flush
5. Sample



Fill out the sample collection form properly



- Use a permanent pen, pencil, or type.
- Make sure you fill it out correctly.
- Don't get in a rush.
- Keep the back page for your records.
- Do not use "Liquid Paper or Wite Out" on sample collection forms. If a mistake is made, strike through, correct the information, then date/initial form.

Complete the left side of the Bacti form

- The date, Time, Water System, System ID#, Site Code, Location, and Collected by

| Bacteriological Collection Form Template | | | |
|---|--------|--|---|
| 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) |
| SECTION 1 – Date and Time Sample Collected (Required) MONTH DAY YEAR HOUR (Must Check Box) Exact Time _____ <input type="checkbox"/> AM <input type="checkbox"/> PM | | | |
| SECTION 2 – Public, Non-Community and Semi-Public System Use Only Water System Name Water System ID Number (Required) Site Code | | | |
| Definite Location of Sample | | City | County |
| SECTION 3 – Private Submitters, ADH, Local Health Units Only Definite Location of Sample | | Collected By: | |
| City | County | Note: \$17.00 Fee Per Sample <input type="checkbox"/> Credit on File, No Fee Included | |
| Send Report To: Name _____ Address _____ City/State/Zip _____ | | | |
| SECTION 4 – Sample Type <input type="checkbox"/> Public Community <input type="checkbox"/> Non-community <input type="checkbox"/> Semi-Public <input type="checkbox"/> Private - \$17 Fee REQUIRED | | | |
| SECTION 5 – Source <input type="checkbox"/> Well <input type="checkbox"/> Surface <input type="checkbox"/> Cistern <input type="checkbox"/> Spring | | | |
| SECTION 6 – Purpose <input type="checkbox"/> Boil Order <input type="checkbox"/> Special/Investigation <input type="checkbox"/> New Construction <input type="checkbox"/> Raw Water <input type="checkbox"/> Raw Water with Count <input type="checkbox"/> Regular Distribution Sample Resample Type: <input type="checkbox"/> Repeat <input type="checkbox"/> Replacement <input type="checkbox"/> Triggered Raw Original Lab # Required | | | |
| Chlorine Residual _____ (circle one) Free or Total | | | |
| ENVIRONMENTAL HEALTH SPECIALIST ONLY <input type="checkbox"/> Swim Beach <input type="checkbox"/> Investigation | | | |
| LABORATORY USE ONLY Rejection/Disclaimer Code _____ Initials _____ Analyst Notes: | | | |

HL-01 (R 04/17)



Complete the right side of the form:

WATER ANALYSIS-BACTERIOLOGICAL

Date and Time Received (Laboratory Use Only) _____

☐ Public Community ☐ Non-community ☐ Semi-Public
☐ Private - \$17 Fee REQUIRED

Source: ☐ Well ☐ Surface ☐ Cistern ☐ Spring

☐ Plant Tap ☐ Special Investigation ☐ New Construction

☐ Regular Distribution Sample ☐ Boil Order

Resample: ☐ Repeat ☐ Replacement

☐ Raw Water ☐ Triggered Raw

Chlorine Residual: _____ Total ☐ Free ☐

Original Lab # _____

ENVIRONMENTAL HEALTH SPECIALIST ONLY

☐ Swimming Pool ☐ Swim Beach ☐ Investigation

LABORATORY USE ONLY

Rejection Code _____ Analyst's Initials _____

Unsatisfactory Code _____

Analyst Notes (Laboratory Use Only) _____

- Check system type
- In the “Source” section check your source type
- Check what kind of sample it is
- Original Lab# for follow-up samples
- Record chlorine residual

FINAL STEP

- Proofread the form to make sure everything is correct, incomplete forms are usually rejected.
- Curl the form around the bottle so that the writing is turned AWAY from the bottle; replace the bottle and the form in the container, and mail or deliver immediately.
- Make sure you get your receipt from the lab or health unit when you drop off your samples. If the lab does not have a receipt make your own with the date, time, name, and signature of person receiving the samples.



INSTRUCTIONS

1. Press firmly - type or print using ball point pen or pencil.
2. Collection Date and Time must be indicated.
3. Community and Non-Community samples must include a water system ID number and a site ID number when available.

HL-01

INSTRUCTIONS

1. Press firmly - type or print using ball point pen or pencil.
2. Collection Date and Time must be indicated.
3. Community and Non-Community samples must include a water system ID number and a site ID number when available.
4. Private samples must include a \$10.00 fee per sample. Make check or money order payable to Arkansas Department of Health.

HL-01

INSTRUCTIONS

1. Press firmly - type or print using ball point pen or pencil.
2. Collection Date and Time must be indicated.
3. Community and Non-Community samples must include a water system ID number and a site ID number when available.
4. Private samples must include a \$10.00 fee per sample. Make check or money order payable to Arkansas Department of Health.

HL-01

| ARKANSAS DEPARTMENT OF HEALTH Laboratory Services, Slot #47 4815 West Markham Street, Little Rock, AR 72205-3867 | | | | |
|--|-----------------|---|--------------------|--|
| LABORATORY USE ONLY DO NOT WRITE IN THIS SPACE | | Laboratory Number (Laboratory Use Only) | | |
| Date and Time Sample Collected | | | | |
| MONTH 5 | DAY 20 | YEAR 04 | HOUR Time 10:20 | |
| Definite Location of Sample or Street & Number/Site ID Number 89 B 002C | | | | |
| City Okolona | County Clark | Collected By: B. Williams | | |
| Send Report To: | | | | |
| Name | | | | |
| Street | | | | |
| City State | | | | |
| Water System Name Okolona Water | | | | |

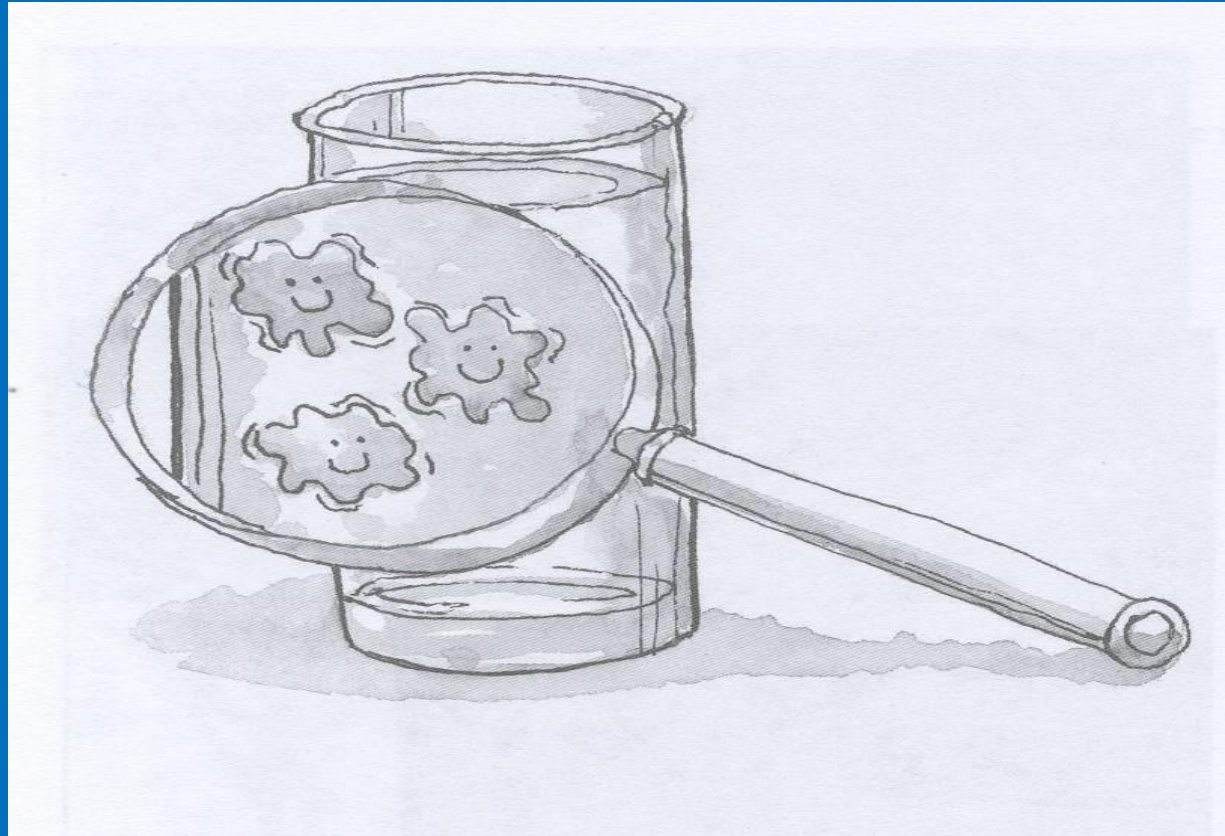


The sample(s) must be ANALYZED by the laboratory within 30 hours of the time of sample collection or it will be rejected.

The day of receipt by the Lab must be a normal business day - not a weekend or Holiday.

We recommend you collect the sample just prior to delivery.

SAMPLE RESULTS: WHAT DO THEY MEAN?



SAMPLE RESULTS

There are three possible results for your sample

- 1) SAFE (A, Absent)
- 2) UNSAFE (TCP, P, Total Coliform Present,
E-coli Present)
- 3) INVALID



SAFE SAMPLES

- ① Do not have to be replaced
- ② Keep you in compliance!



UNSAFE SAMPLES (Present) or (P)

*******MUST BE RESAMPLED*******

- Resample Original site
- Sample Upstream location
- Sample Downstream location

INVALID SAMPLES

- An Invalid sample is neither safe nor unsafe.
- * If a sample result shows that a sample is “Invalid”, that sample must be replaced with a sample from the original site where it was collected.

Resamples

- To be taken within 24 hours* of receipt of notice of coliform positive result.
- Must be taken at the same site as the original (plus upstream and downstream sites for Coliform positive).
- **Must reference the lab number of the original sample triggering the resamples**
- Must be marked resample–repeat (following TCP) or resample–replacement (rejected)
- All Repeat samples to be collected on the same day.

Original Sample Result

| | | | | | | | |
|----------------------|----------------|--------------------------|--------------|-----------------|-------------------------|----------------------|---------------------|
| <u>Lab no</u> | <u>Site ID</u> | <u>Site Address</u> | 1201 MY LANE | <u>County</u> | <u>Collected Time</u> | <u>Received Time</u> | <u>Collected by</u> |
| 1500675 | 001B003 | | | INDE | 7022014 1130 | 7032014 742 | M W |
| <u>Specimen code</u> | WEL | <u>Purpose</u> | REG | <u>Category</u> | PUB | <u>Rejection</u> | |
| <u>Comments</u> | | <u>Chlorine Residual</u> | | <u>Results</u> | TOTAL COLIFORMS Present | | |
| | | <u>Disclaimer</u> | | | E. COLI Absent | | |

| | | | | | | | |
|---|--------|--|---------------|---|-----------------------------|--|--|
| 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) | |
| Date and Time Sample Collected (Required) | | | | | | | |
| MONTH | DAY | YEAR | HOUR | (Must Check Box) | | | |
| | | | Exact Time | <input type="checkbox"/> AM | <input type="checkbox"/> PM | | |
| Public/Non-Community System Use Only | | | | | | | |
| Water System Name | | Water System ID Number (Required) | | Site Code | | | |
| Definite Location of Sample | | City | County | Collected By: | | | |
| Private Submitters/Local Health Units Only | | | | | | | |
| Definite Location of Sample | | | Collected By: | | | | |
| City | County | Note: Private Submitters Must Enclose a \$17.00 Per Sample Fee | | | | | |
| Send Report To: | | | | | | | |
| Name | | | | | | | |
| Address | | | | | | | |
| City/State/Zip | | | | | | | |
| ENVIRONMENTAL HEALTH SPECIALIST ONLY | | | | | | | |
| <input type="checkbox"/> Swimming Pool <input type="checkbox"/> Swim Beach <input type="checkbox"/> Investigation | | | | | | | |
| LABORATORY USE ONLY | | | | | | | |
| Rejection Code | | | | Analyst's Initials | | | |
| Unsatisfactory Code | | | | | | | |
| Analyst Notes (Laboratory Use Only) | | | | | | | |

Resample Within the Site Plan

Following a sample that is total coliform positive repeat samples must be collected from:

- Sample at original site.
- Sample at a downstream site. (within 5 services)
- Sample at an upstream site. (within 5 services)

Must include original sample number reference

Must follow approved sample site plan



SAMPLING SITE PLAN

SITE IDENTIFICATION FORM

Anytown Waterworks 001
PUBLIC WATER SYSTEM NAME **ID #**

| SITE NUMBER <u>1</u> | PWS ID # | SITE # | LOCATION (STREET ADDRESS) |
|----------------------|--------------|--------------|------------------------------------|
| REGULAR SAMPLE | <u>001 B</u> | <u>001</u> | <u>500 Main St</u> |
| REGULAR RESAMPLE | <u>001 B</u> | <u>001 A</u> | <u>***** (SAME AS ABOVE) *****</u> |
| DOWNSTREAM RESAMPLE | <u>001 B</u> | <u>001 B</u> | <u>600 Main St</u> |
| UPSTREAM RESAMPLE | <u>001 B</u> | <u>001 C</u> | <u>400 Main St</u> |
| ALTERNATE RESAMPLE | <u>001 B</u> | <u>001 D</u> | <u>550 Main St</u> |

| SITE NUMBER <u>2</u> | PWS ID # | SITE # | LOCATION (STREET ADDRESS) |
|----------------------|-------------|--------------|------------------------------------|
| REGULAR SAMPLE | <u>001B</u> | <u>002</u> | <u>300 Peach St</u> |
| REGULAR RESAMPLE | <u>001B</u> | <u>002 A</u> | <u>***** (SAME AS ABOVE) *****</u> |
| DOWNSTREAM RESAMPLE | <u>001B</u> | <u>002 B</u> | <u>400 Peach St</u> |
| UPSTREAM RESAMPLE | <u>001B</u> | <u>002 C</u> | <u>200 Peach St</u> |
| ALTERNATE RESAMPLE | <u>001B</u> | <u>002 D</u> | <u>250 Peach St</u> |

| SITE NUMBER <u>3</u> | PWS ID # | SITE # | LOCATION (STREET ADDRESS) |
|----------------------|-------------|--------------|------------------------------------|
| REGULAR SAMPLE | <u>001B</u> | <u>003</u> | <u>1201 My Lane</u> |
| REGULAR RESAMPLE | <u>001B</u> | <u>003 A</u> | <u>***** (SAME AS ABOVE) *****</u> |
| DOWNSTREAM RESAMPLE | <u>001B</u> | <u>003 B</u> | <u>1300 My Lane</u> |
| UPSTREAM RESAMPLE | <u>001B</u> | <u>003 C</u> | <u>1100 My Lane</u> |
| ALTERNATE RESAMPLE | <u>001B</u> | <u>003 D</u> | <u>1250 My Lane</u> |



Repeat Samples

- RTCR - Failure to conduct all required Repeat sampling will trigger a Level 1 or 2 assessment as appropriate.

**E.Coli* MCL issued in addition to a Level 2 Assessment trigger if all repeat sampling not conducted after an *E.Coli* positive routine sample.

Repeat Samples

- If any repeat sample is total coliform positive, an additional set of repeat samples must be collected*.
- *The process must be repeated until one complete set is negative, or it is determined that a MCL has been exceeded or an Assessment has been triggered.

BACTERIOLOGICAL SUMMARY REPORT

Division of Engineering
Arkansas Department of Health
4815 West Markham Street Slot 37
Little Rock, Arkansas 72205-3867

Tuesday, April 01, 2003

Your Water System Pws ID XXX
Your name
Your Address
Your City, AR Zip

The following samples were Total Coliform and E. Coll absent, no action is required.

| | | | | | | | | | |
|----------------------|------------------------------|---------------------|--------------|-------------------|------------------|-----------------------|------------------------|-----------------|---------------------|
| <u>Lab No.</u> | <u>Site</u> | <u>Site Address</u> | DOROTHY WADE | <u>County</u> | <u>Collected</u> | <u>Time</u> | <u>Received</u> | <u>Time</u> | <u>Collected By</u> |
| 3045002 | 472B001 | 70 HARVARD | | CRIT | 3262003 | 800 | 3272003 | 740 | Your Name |
| <u>Specimen code</u> | WEL | <u>Purpose</u> | REG | <u>Category</u> | PUB | <u>Rejection code</u> | <u>RESULT</u> | TOTAL COLIFORMS | ABSENT/100 ML |
| | | | | | | | E. COLI ABSENT/1 00 ML | | |
| <u>Comment</u> | ANALYZED 03/27/2003 10:30 AM | | | <u>Disclaimer</u> | | | | | |

| <u>Lab No.</u> | <u>Site</u> | <u>Site Address</u> | <u>County</u> | <u>Collected</u> | <u>Time</u> | <u>Received</u> | <u>Time</u> | <u>Collected By</u> |
|----------------------|------------------------------|------------------------------------|---------------------|-----------------------|---------------|------------------------|-------------|---------------------|
| 3045003 | 472B003 | CORNELIUS WHITAKER JR 111 GANNT | CRIT | 3262003 | 830 | 3272003 | 740 | Your Name |
| <u>Specimen code</u> | WEL | <u>Purpose</u> REG | <u>Category</u> PUB | <u>Rejection code</u> | <u>RESULT</u> | TOTAL COLIFORMS | | ABSENT/100 ML |
| | | | | | | E. COLI ABSENT/1 00 ML | | |
| <u>Comment</u> | ANALYZED 03/27/2003 10:30 AM | | <u>Disclaimer</u> | | | | | |



Division of Engineering
Arkansas Department of Health
4815 West Markham Street Slot 37
Little Rock, Arkansas 72205-3867

BACTERIOLOGICAL SUMMARY REPORT

Tuesday, April 01, 2003

Your Water System Pws ID XXX
Your name
Your Address
Your City, AR Zip

CHECK THE FOLLOWING RESULTS AND IF REQUIRED TAKE THE APPROPRIATE ACTION LIST BELOW

| | | | | | | | | | |
|--|-------------|---------------------|-----------------|-----------------|------------------|------------------|-----------------------|-------------|---------------------|
| <u>Lab No.</u> | <u>Site</u> | <u>Site Address</u> | SHIRLEY PERKINS | <u>County</u> | <u>Collected</u> | <u>Time</u> | <u>Received</u> | <u>Time</u> | <u>Collected By</u> |
| 3045087 | 378B001 | 102 BERNICE DR | | MISS | 3262003 | 1520 | 3272003 | 943 | Your Name |
| <u>Specimen code</u> | WEL | <u>Purpose</u> | REG | <u>Category</u> | PUB | <u>Rejection</u> | QUANTITY INSUFFICIENT | | |
| <u>Comment</u> | | | | | | <u>Result</u> | | | |
| Actions to Take: Collect one repeat sample at the same site. | | | | | | | | | |
| 1 BOTTLE(S) WILL BE SENT TO YOU FOR RE-SAMPLES Additional information is shown in the column (Interpretation) on the back of this form. | | | | | | | | | |



Division of Engineering
Arkansas Department of Health
4815 West Markham Street Slot 37
Little Rock, Arkansas 72205-3867

BACTERIOLOGICAL SUMMARY REPORT

Tuesday, April 01, 2003

Your Water System Pws ID XXX
Your name
Your Address
Your City, AR Zip

CHECK THE FOLLOWING RESULTS AND IF REQUIRED TAKE THE APPROPRIATE ACTION LIST BELOW

| | | | | | | | | | |
|--|------------------------------|---------------------|------------------|-----------------|------------------|-----------------------|---------------------------------|-------------|---------------------|
| <u>Lab No.</u> | <u>Site</u> | <u>Site Address</u> | TRUE VINE CHURCH | <u>County</u> | <u>Collected</u> | <u>Time</u> | <u>Received</u> | <u>Time</u> | <u>Collected By</u> |
| 3045001 | B002 | 326 HWY 77 BYPASS | | CRIT | 3262003 | 815 | 3272003 | 740 | Your Name |
| <u>Specimen code</u> | WEL | <u>Purpose</u> | REG | <u>Category</u> | PUB | <u>Rejection</u> | | | |
| <u>Comment</u> | ANALYZED 03/27/2003 10:30 AM | | | | | | | | |
| | | | | | <u>Result</u> | P | TOTAL COLIFORMSPRESENT/100 ML** | | |
| | | | | | EA | E. COLI ABSENT/100 ML | | | |
| Actions to Take: Three repeat samples must be collected on the same day, one at the original site, site A; one within 5 service connections up stream, site B; & one within 5 service connections down stream, site C. Use the appropriate site identification number including the A,B or C designation (see your bacteriological sample site plan). Water systems with only one service connection, may collect all samples from the same site. | | | | | | | | | |
| 3 BOTTLE(S) WILL BE SENT TO YOU FOR RE-SAMPLES <i>Additional information is shown in the column (Interpretation) on the back of this form.</i> | | | | | | | | | |



Confirmed E-Coli Positive Samples

Acute MCLs

- Confirmed Total Coliform positive repeat sample following an initial *E-Coli* positive sample.
- Confirmed *E-Coli* positive repeat sample following an initial Total Coliform or *E-Coli* positive sample.

RTCR also includes:

- Failure to take all required repeat samples following an *E-Coli* positive sample.
- Failure to test for *E-Coli* when any repeat sample is Total Coliform positive.



Acute MCL Violation

Acute MCL Violation Example #1

Routine Sample

Total
Coliform
Present

In at least one (1)
of the related
Repeat samples

E. coli
Present

Acute MCL Violation Example #2

Routine Sample

E. coli
Present

In at least one (1)
of the related
Repeat samples

Total
Coliform
Present
OR *E.*
coli
Present

Acute MCLs

When an Acute MCL is issued, the system must conduct public notice within 24-hours. The ADH requires the system issue a Boil-Water Advisory to consumers until follow-up samples verify the presence of disinfectant residual and the absence of Coliform bacteria.



Acute MCLs

The RTCR will also require that a Level 2 assessment of the water system be conducted to identify the possible presence of sanitary defects or monitoring practices and the likely reason for triggering the assessment.



Multiple Coliform Positive Samples

- Trigger levels for Coliform positive samples:
 - Two (2) or more coliform positive samples for systems collecting less than 40 routine samples per month
 - More than 5% coliform positive samples for systems collecting 40 or more routine samples.
- Trigger results in a Level 1 Assessment, if a second trigger occurs within 12 months, a Level 2 Assessment is required

Level 1 Assessments

- A basic examination of the source water, treatment, distribution system and relevant operational practices
- Purpose is to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment.
- Conducted by the Water System



Level 2 Assessments

- A more in-depth examination of the source water, treatment, distribution system and relevant operational practices
- Purpose is to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment.
- Conducted by the State



Assessments Elements

- Minimum elements include
 - Review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired.
 - Changes in distribution system maintenance and operation that could affect distributed water quality.
 - Source and treatment considerations that bear on distributed water quality.
 - Existing water quality monitoring data.
 - Inadequacies in sample sites, sampling protocol, and sample processing.

Assessments

- Assessment report due to the State within 30-days of PWS learning of the trigger.
- Sanitary defects, corrective actions completed, and a proposed timetable for any corrective actions (if needed) not already completed must be described in the assessment report the PWS submits to the State.
- If the State determines the assessment is not sufficient, the State must consult with the PWS and the PWS must submit a revised report on an agreed-upon schedule



RTCR Level 1 Assessment Form

| | | | | | |
|---|--|------------------------------|-----------------------------|-------------------|--|
| System Name: | | Source Water: | | PWSID # | |
| System Type: | | Population Served: | | PWS Address: | |
| Operator in Responsible Charge (ORC): | | Phone: | | Sample Site info: | |
| City, State: | | | | | |
| County: | | | | | |
| Person that collected TC samples if different than ORC: | | Phone: | | | |
| Address, City, State, Zip: | | | | | |
| Date Assessment Completed: | | Completed by: | | | |
| Questions (1-4) | | Reviewed? (Y/N or N/A) | Issue(s) Found? (Y/N) | Issue Description | Corrective Action Taken (Including Date) |
| 1. Evaluate sample site. -condition or location of tap -adequate disinfectant level maintained -regular use of tap/service -history of sample results from site -POE/POU -softeners | | | | | |
| 2. Sample protocol followed and reviewed. -flush tap -disinfect/sterilize tap -remove aerator -sample storage acceptable -no swivel -fresh sample bottles | | | | | |
| 3. Have any of the following occurred at relevant facilities prior to the collection of TC samples? -any interruptions or upsets in the treatment process -any reported loss of pressure events -reported vandalism and/or unauthorized access to facilities -visible indicators of unsanitary conditions reported -Has there been a fire fighting event, flushing operation, sheared hydrant, etc. | | | | | |
| 4. Have there been any recent operational changes to the system? -sources introduced -treatment or operational changes -maintenance activities -potential sources of contamination | | | | | |

RTCR Level 1 Assessment Form

| Questions (5-8) | Reviewed? (Y/N or N/A) | Issue(s) Found? (Y/N) | Issue Description | Corrective Action Taken (Including Date) |
|---|------------------------------|-----------------------------|-------------------|--|
| 5. Distribution System -system pressure -cross connection -pump station -repairs -air relief valves -fire hydrants or blow off -breaks | | | | |
| 6. Storage Tank -screens -security -access opening -condition of tank -vent -drain / overflow -pressure tank -O&M | | | | |
| 7. Treatment Process -interruptions / upsets -O&M -monitoring | | | | |
| 8. Source - Well -sanitary seal -vent screened -air gap -pump to waste line -cross connection -security Spring -condition of spring development -condition of spring box -security Surface Water -heavy rainfall -high turbidity -lake turnover -algae blooms -other impacts | | | | |

Additional Comments:

Name of person completing form: _____ Signature: _____ Date: _____

Title and Organization: _____

Complete the assessment and submit this form within 30 days to:

Engineering Section, Slot 37
Arkansas Department of Health
4815 W. Markham St.
Little Rock, AR 72205**Reserved for State**

1. Assessment has been successfully completed. (Y/N & Date)
2. Likely reason for total coliform positives occurrence is established.
3. System has corrected the problem. (Y/N & Date)
4. Was a reset requested and / or granted? – Rationale
5. Name of State reviewer:

| |
|--|
| |
| |
| |
| |
| |



Assessments – Corrective Action

- The PWS must correct all sanitary defects found during the assessment
- For corrective actions not completed by the time the report is submitted, the PWS must complete the corrective actions in compliance with a timetable approved by the State
 - The PWS must notify the State when each scheduled corrective action is taken
- Corrective actions should be completed in accordance with recognized industry guidance and best professional judgment.



Assessments - Violations

- Treatment Technique (TT) Violations
 - PWS fails to conduct required Assessment
 - PWS fails to conduct required Corrective Action(s) identified during the Assessment
 - Public notice required for TT violations.



Assessments - CCR

- Annual PWS Consumer Confidence Report (CCR) must contain information about the number of assessments required and corrective actions taken, and, if appropriate, the number of corrective actions not completed.



SAMPLE RESULTS

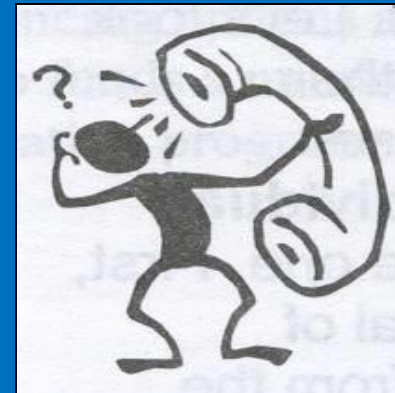
- After you send your sample in you should receive your results in 7-10 working days. If you do not- Call and check on your sample.

Why?

- To make sure you will be in compliance.

Because:

- The lab may not have received it.
- It could be lost in the mail.
- Never shipped.
- Or the results may just be behind schedule.





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Drinking Water Information for Arkansans

An abundant supply of safe, high-quality drinking water is vital to everyone's health, comfort, quality of life and economic well-being. Because Arkansans depend upon professionals affiliated with our water utilities and with our state agencies, including the Arkansas Department of Health (ADH), to ensure a constant supply of dependable, safe, clean water service to our homes, farms, business and industries.

- [Bacteriological Sample Results](#)
- [Boil Water Order Status Report](#)

| Contact | Address | Phone | Fax |
|-----------------------|--|--------------|--------------|
| Drinking Water | 4815 West Markham, Slot 37 Little Rock, AR 72205-3867 | 501 661-2623 | 501 661-2032 |

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American Recovery and
Reinvestment Act of 2009

Arkansas Department of Health
4815 West Markham Street
Little Rock, Arkansas 72205
1-501-661-2000 or 1-800-462-0599
[Google Map](#)

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Clicking on a letter in the block below will open a new browser window which will contain a listing of bacteriological sample results for public water systems whose names start with the number or letter indicated. Samples are listed only if the results have been finalized, or if the sample was rejected. **Samples in process are not shown!**

Only samples received by the Arkansas Department of Health Laboratory in the past 30 days are shown.

Raw water samples are not shown. Construction samples not submitted under the water system's ID number are also not shown.

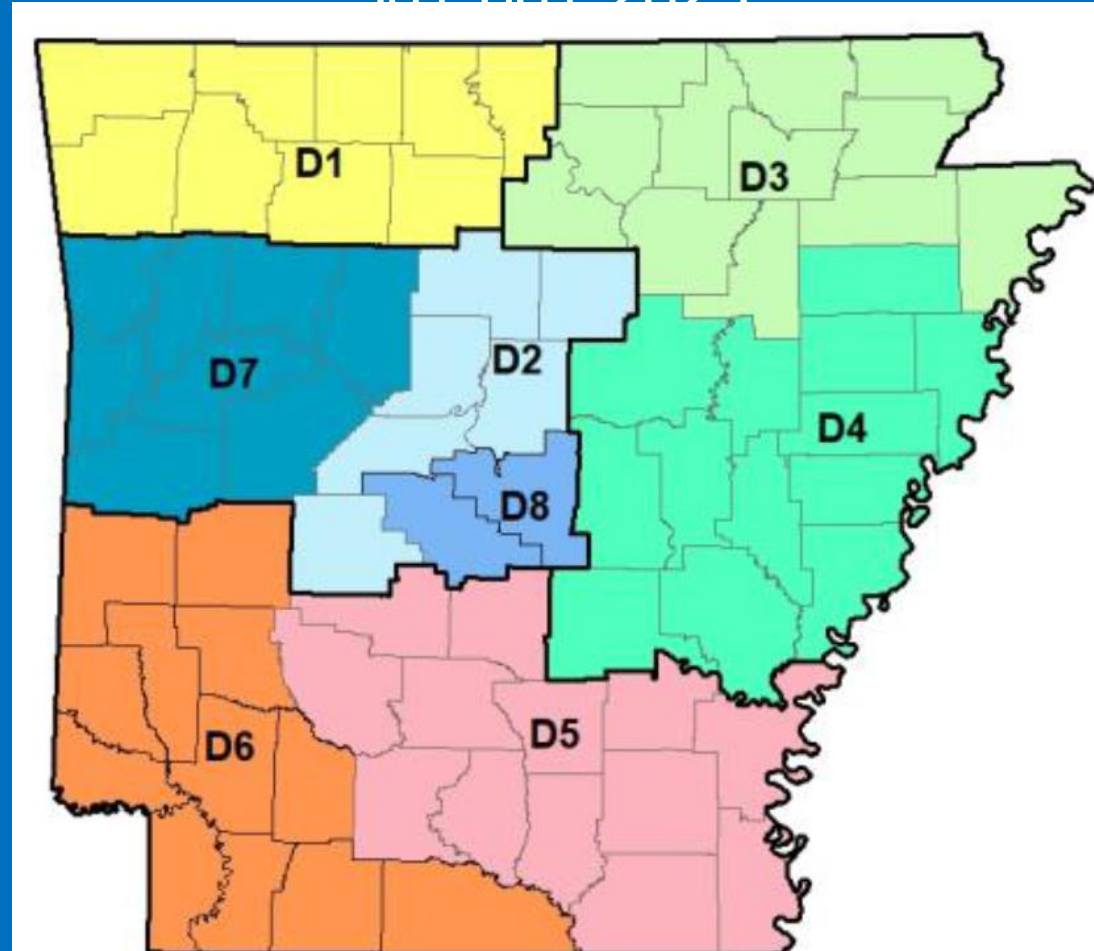
1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

PWS Bacti Results for samples received in the past 30 days

| system name | pws id | Lab # | collected | Date Received | Site id | Site Location | collected by | purpose | Total Coliform | E Coli |
|-------------------|--------|---------|-----------|---------------|-----------|---|---------------|---------|-----------------------|---------------|
| WATER ASSOCIATION | 544 | 1209987 | 8232011 | 08/24/2011 | 544B004 | ELVIN HELMS, 127 RUSHWOOD RD ELDORADO | GW | REG | Total Coliform Absent | E Coli Absent |
| WATER ASSOCIATION | 544 | 1209988 | 8232011 | 08/24/2011 | 544B001 | LLOYD WOOD , 5423 JCT CITY HWY ELDORADO | NOT INDICATED | REG | Total Coliform Absent | E Coli Absent |
| WATER ASSOCIATION | 544 | 1209985 | 8232011 | 08/24/2011 | 544B005 | RONNIE COURTNEY , 2846 IRON MTN RD ELDORADO | GW | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1210919 | 8312011 | 09/01/2011 | 569Z74160 | PATHWAY CHURCH FIRE LINE, FAYETTEVILLE | JORDAN | NEW | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1210781 | 8302011 | 08/31/2011 | 569Z74160 | PATHWAY CHURCH FIRE LINE, FAYETTEVILLE | JORDAN | NEW | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1210413 | 8252011 | 08/26/2011 | 569Z74159 | U OF A FOOTBALL, FAYETTEVILLE | JORDAN | NEW | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1210210 | 8242011 | 08/25/2011 | 569Z73405 | U OF A FOOTBALL, FAYETTEVILLE | JORDAN | NEW | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1209377 | 8172011 | 08/18/2011 | 569Z74148 | U OF A 12" PHASE III, FAYETTEVILLE | JORDAN | NEW | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1208224 | 8112011 | 08/12/2011 | 569B017 | 1950 N LEVERITT AVE, | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1208223 | 8112011 | 08/12/2011 | 569B014 | 1130 N GARLAND AVE , | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1208222 | 8112011 | 08/12/2011 | 569B015 | 708 N GARLAND AVE, | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1208221 | 8112011 | 08/12/2011 | 569B041 | 2345 W DOGWOOD ST, | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1208220 | 8112011 | 08/12/2011 | 569B090 | 3526 N HWY 112, | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1207945 | 8102011 | 08/11/2011 | 569B028 | 100 N SUMMIT AVE, | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1207944 | 8102011 | 08/11/2011 | 569B036 | 1802 N COLLEGE AVE, | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1207943 | 8102011 | 08/11/2011 | 569B083 | 205 W 6TH ST , | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1207942 | 8102011 | 08/11/2011 | 569B037 | 380 N COLLEGE AVE, | WATKINS | REG | Total Coliform Absent | E Coli Absent |
| LE WATERWORKS | 569 | 1207941 | 8102011 | 08/11/2011 | 569B038 | 863 W DICKSON ST , | WATKINS | REG | Total Coliform Absent | E Coli Absent |

ENGINEERING DISTRICTS

501-661-2623



* ES (Environmental Specialist)

BACTERIOLOGICAL MONITORING REPORT



BMR

- 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.
- The completed form must be submitted to the Engineering Section by the *10th day* of the month following measurement.
- Failure to submit form by the 10th can result in a Monitoring and Reporting violation.

Bacteriological Monitoring Report

- Required Information:
 - Date - date samples are taken
 - Sample Site # - For regular and resamples, samples must be from an approved sample site plan
 - Type of Sample – Regular, Resample (Repeat/Replacement), Raw, etc.
 - Disinfectant Residual - Residual measured from each site sampled for TCR compliance at the time the bacteriological sample is collected.



Arkansas Department of Health / Engineering Section

Co. Water

MONTH: February

YEAR 2012

COUNTY Boone FWS ID # 628

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.

Training Purpose

Siggesmunds

Priscilla Lupton

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

BMR

Type of sample:

- Regular* - normal monthly compliance sample/site plan
 - Repeat* - repeat (w/ upstream, downstream) for sample that was coliform positive, etc.
 - Replacement* - replacement for sample that was invalid - quantity not sufficient, old, leaked in transit, etc.
- Raw (or Triggered Raw) - untreated water from the source of supply (Triggered - GWR).
- Boil Order* - self explanatory
- Special / Investigative*, New Construction*, Plant Tap*
 - samples submitted for special purposes

*Chlorine Residual - Chlorine residual measured at the tap sampled on the day of sampling, left blank for Raw samples.



BMR

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



Arkansas Department of Health / Engineering Section

MONTH February

YEAR 2012

COUNTY

PWS ID #

628

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.

Training Purpose

Signatures

Training Purpose

Put any notes or summaries on reverse sides; make a copy for your portfolio & return to address on reverse side



What happens to samples
once they reach our lab?



Laboratory Information

- The ADH uses the “MMO MUG” or colilert method to test for total coliform bacteria and E-coli bacteria.
- Colilert is a reagent that is added to a 100 ml sample. A single cell of coliform bacteria will turn the sample yellow. The presence of a single cell of E-coli bacteria will turn the sample blue under fluorescent light.
- There is an 18 hour and 24 hour colilert reagent. The 18 hour reagent can only be used for boil order samples. Incubation temperature is 35°C (95°F).

“MMO-MUG”

Minimal Medium ONPG (O-Nitrophenyl- β -
dgalactopyranoside)
and MUG (4-Methylumbelliferyl- β -dglucuronide)

Totally unimportant, I just figured you'd ask!

SOME DAYS IT'S THIS MANY....



OTHER TIMES IT'S THIS MANY (OR A WHOLE LOT MORE)



OPENING THE CANS



CHECKING THE FORMS FOR ERRORS



CHECKING THEM TWICE



ASSIGNING LABORATORY NUMBERS



PLACING SAMPLE NUMBERS ON BOTTLES



This is why **Operators** do not write on the caps or the sides or place labels on the bottles.

SAMPLES WITH PROBLEMS?



SAMPLE BOTTLE ISSUES

- Do not write on caps and sides of bottles. The ADH laboratory uses this space to write lab numbers for keeping track of samples. Writing on the sides obstructs the view of the samples and also causes fluorescence & interferes with reading the results.
- Do not place Avery-type labels on the bottles which obstructs the view of the samples and also causes fluorescence.
- Do not use “liquid paper or White-Out” on the sample collection forms (lab slips). This causes extra time in processing for the samples and delays final results. If a mistake is made, strike through the incorrect information, correct, and initial/date form.



ADDING COLILERT REAGENT

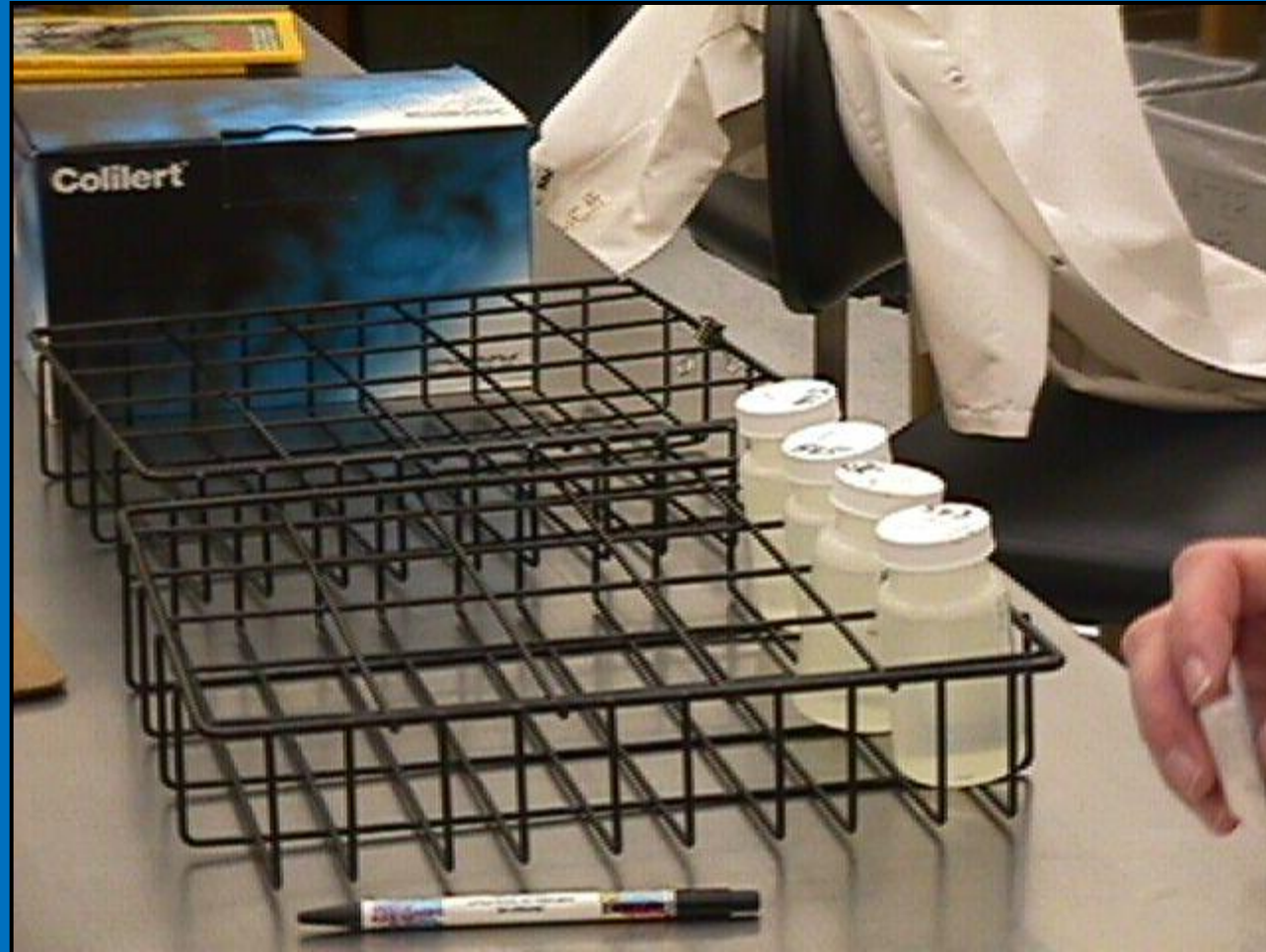


Coliform bacteria produce an enzyme that reacts with the colilert reagent and turns the reagent yellow.

MIXING REAGENT WITH THE SAMPLES



PREPARING SAMPLES FOR INCUBATOR



SETTING SAMPLES IN THE INCUBATOR



CHECKING UPPER INCUBATOR TEMP



CHECKING LOWER INCUBATOR TEMP





ULTRAVIOLET LIGHT

E. coli FLUORESCCE UNDER UV LIGHT



TOTAL COLIFORM POSITIVE

PREPARING FOR E. coli TEST

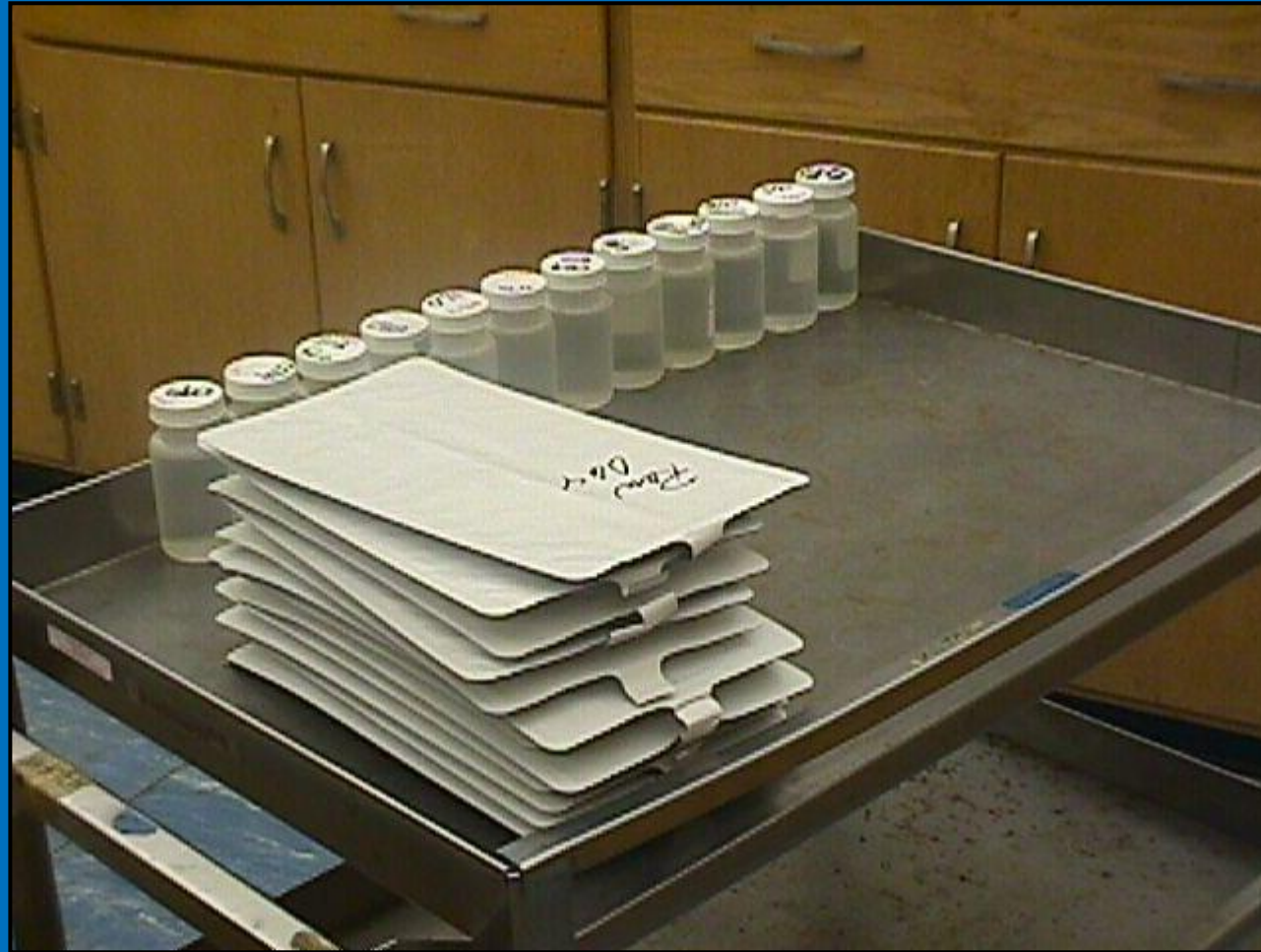


WATER MICROBIOLOGIST CONFIRMING PRESENCE OF E. coli





RAW WATER SAMPLES TO BE ANALYZED



PREPARED THE SAME AS REGULAR SAMPLES



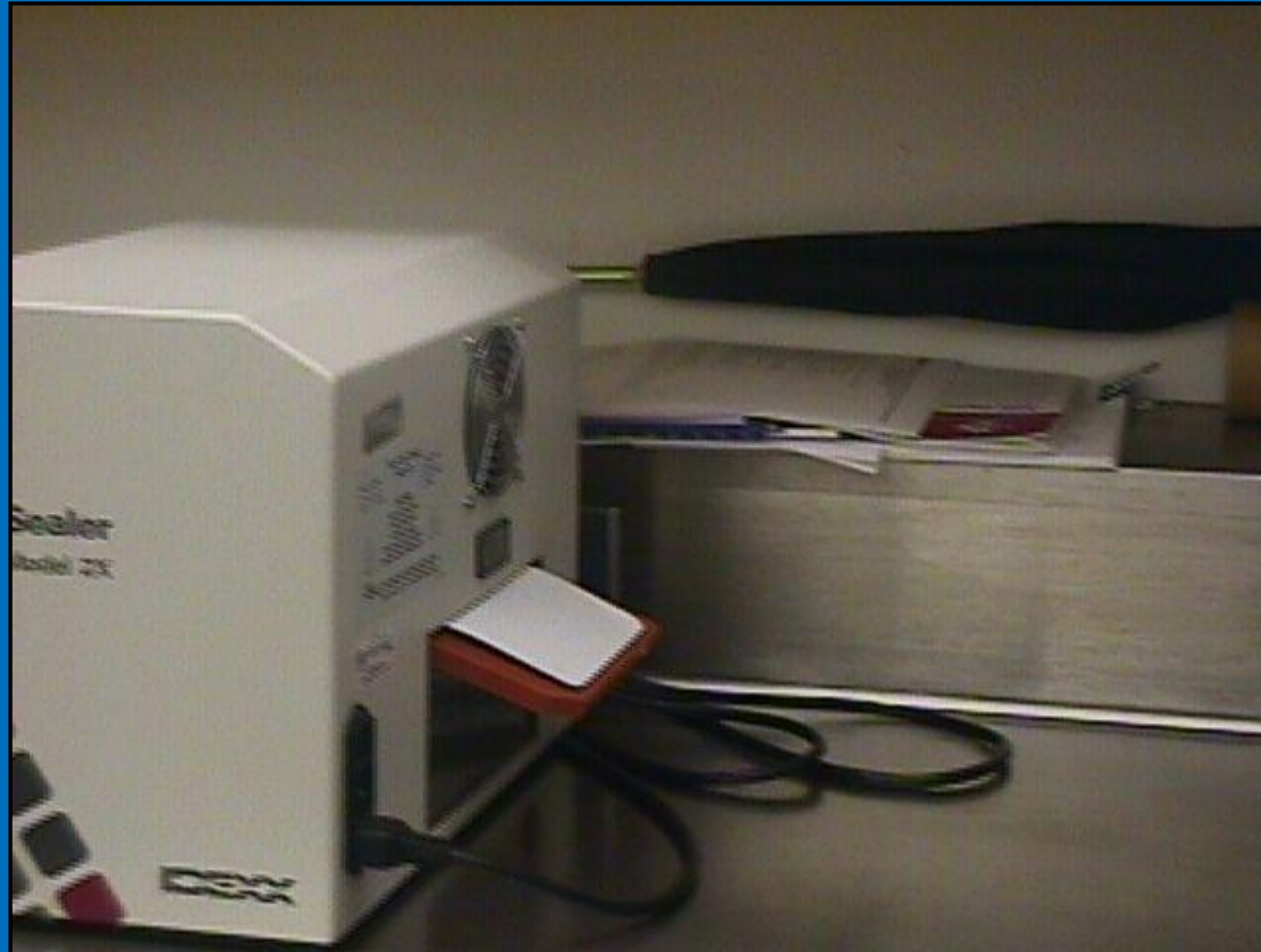
POURING THE SAMPLE INTO QUANTITRAY

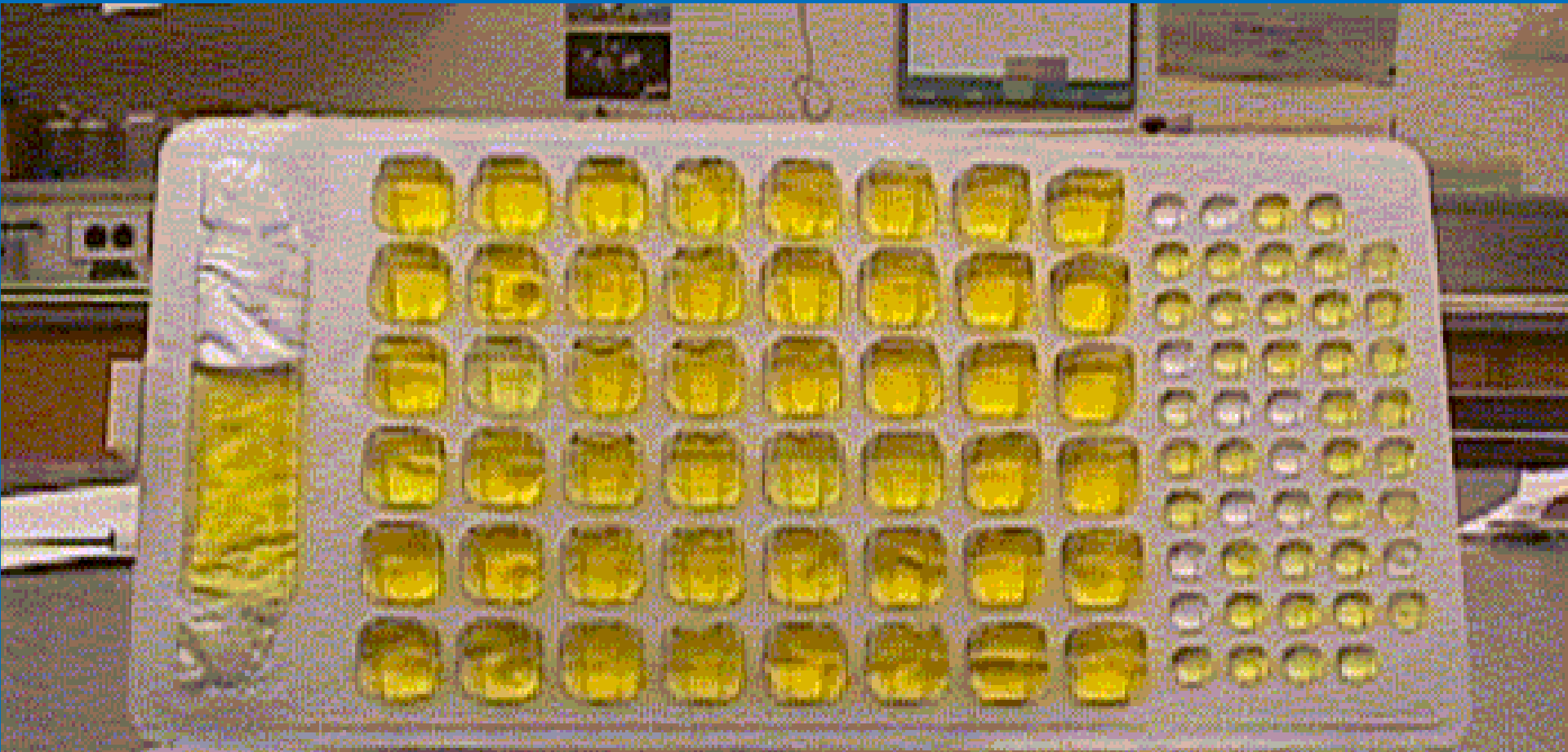


PLACING TRAY IN SEALER



QUANTITRAY SEALED





The total count is statistically determined by the number of large wells and number of small wells that come up positive.



LAB RESULTS ENTERED INTO DATABASE



**Are there any
questions?**



REVIEW

- Who is responsible for the submission of monthly Bac-T samples?
 - A. ADH
 - B. EPA
 - C. Water Utility
 - D. AWW WEA
- C. Water Utility



REVIEW

- What ACT requires all public water systems to collect and analyze water samples?
 - A. Taft-Hartley ACT
 - B. Safe Drinking Water Act
 - C. Act 333 of 1957
 - D. Glen T. Kellogg Act
- B. Safe Drinking Water Act



REVIEW

- What determines the number of regular compliance bacti samples pulled each month?
 - A. Population
 - B. License Grade
 - C. THM levels for previous quarter
 - D. Type of disinfectant used

A. Population



REVIEW

- Bacteriological monitoring records must be maintained for how long?
 - A. 10 years
 - B. until the next billing cycle
 - C. 5 years
 - D. forever
- C. 5 years

REVIEW

- Failure to monitor for coliform bacteria will result in?
 - A. a boil order
 - B. double sampling the next month
 - C. public notification
 - D. lost bonus points
- C. Public Notification



REVIEW

- A sample site plan must be?
 - A. Submitted to and approved by the ADH
 - B. Submitted by a professional engineer
 - C. 2 pages long
 - D. Submitted and filed with the Governor's Office
- A. Submitted to and approved by the ADH

REVIEW

- How often must Community Public Water Systems submit bacti samples?
 - A. as needed
 - B. Quarterly
 - C. when the operator has time
 - D. Monthly
- D. Monthly



REVIEW

- The minimum number of monthly samples that a system can submit?
 - A. 1
 - B. 3
 - C. 5
 - D. 0
- B. 3



REVIEW

- All sample bottles should be?
 - A. clear, volumetric and collated
 - B. supplied by the ADH
 - C. only reused after washing and air drying
 - D. filled to the top with no air gap
- B. supplied by the ADH

REVIEW

- Bacti samples should be collected from?
 - A. non-swivel type faucets
 - B. fire hydrants
 - C. water hoses
 - D. mayor's house
- A. non-swivel type faucets



REVIEW

- The underlying basis for the Total Coliform Rule is the detection of?
 - A. germs
 - B. aliens
 - C. coliforms
 - D. diatoms
- C. coliforms



REVIEW

- Routine compliance samples without a sample site code will be?
 - A. analyzed first
 - B. rejected
 - C. carbonized for later analysis
 - D. published in the newspaper
- B. rejected



REVIEW

- All bacti samples must be?
 - A. held for 2 days
 - B. pulled by the ADH
 - C. received by the lab within 30 hours
 - D. chilled for shipment
- C. received by the lab within 30 hours

REVIEW

- Bacti bottles should ?
 - A. be rinsed and air dried
 - B. be disinfected by the operator
 - C. be stored in a refrigerator
 - D. have a sterilization seal
- D. have a sterilization seal

REVIEW

- Resamples should be taken?
 - A. within 24 hours of notice of coliform positive result
 - B. during the next months sample period
 - C. only during nightly flushing periods
 - D. about 11:00 in the morning
- A. within 24 hours of notice of coliform positive result



REVIEW

- If a sample is total coliform positive?
 - A. no resamples are required
 - B. resamples can only be pulled from alternate sites
 - C. resamples must be from upstream, downstream, and original site
 - D. resamples must be from side stream sites
- C. resamples must be from upstream, downstream, and original site



REVIEW

- An invalid sample is?
 - A. a good thing to have
 - B. unsafe
 - C. safe
 - D. neither safe or unsafe
- D. neither safe or unsafe

REVIEW

- A sample bottle should be filled?
 - A. to overflowing
 - B. halfway
 - C. to the indicator mark
 - D. then emptied and refilled with a 7 % bleach solution
- C. to the indicator mark

REVIEW

- Chemical analysis reports should be maintained for?
 - A. 5 years
 - B. 10 years
 - C. until notified by mayor
 - D. until next analysis
- B. 10 years



REVIEW

- Who is responsible for the submission of compliance bacti samples?
 - A. ADH
 - B. Ar Rural Water Association
 - C. Water System
 - D. Tiger Woods
- C. Water System



REVIEW

- All repeat samples should be collected?
 - A. by the most senior operator
 - B. on the same day
 - C. on consecutive days
 - D. by the same person as the original
- B. on the same day

REVIEW

- In order to be analyzed, a bacti sample must contain?
 - A. 1 liter of water
 - B. 10 mg/l of water
 - C. 2 parts water/1 part bourbon
 - D. 100 ml. Of water
- D. 100 ml. Of water

REVIEW

- The five steps to sampling are?
 - A. flame, flush, fill, empty, refill
 - B. flush, check chlorine, flame, flush, sample
 - C. flame, flush, flame, flush, sample
 - D. flame, check chlorine, flush, sample
- B. flush, check chlorine, flame, flush, sample

REVIEW

- Which of the following results would be considered a safe sample
 - A. LTL - leaked in transit
 - B. P- coliform present
 - C. NSI - no site indicated
 - D. A - coliform absent
- D. A - coliform absent



REVIEW

- Failure to receive sample bottles?
 - A. relieves the system of sampling for the month
 - B. does not relieve the system from sampling for the month
 - C. is an indication of safe water
 - D. is an indication of unsafe water
- B. does not relieve the system from sampling for the month

Thank you.

