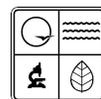


# MICROBIOLOGICAL SAMPLE SITING PLAN

## For Public Drinking Water Systems

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Missouri  
Department of  
Natural Resources

Missouri Safe Drinking Water Regulations require all public water systems to collect microbiological samples according to a written sample siting plan. The purpose of the microbiological sample siting plan is to insure microbiological samples are collected at locations representative of the entire distribution system. While having and maintaining a microbiological sample siting plan is required by state regulations, it also benefits the water system when new operators or sample collectors are employed and when troubleshooting the cause of coliform-positive microbiological samples.

To begin creating a microbiological sample siting plan you should start with a map of the water system. Specify on the map the location of source water, wells, treatment plant, storage facilities and the distribution lines. For larger systems such as cities and water districts, you should have engineering plans or use a street map to develop the sampling plan. For smaller water systems such as resorts, subdivisions and mobile home parks, a simple map or sketch of the grounds indicating the location of each building, service connection, well house, storage tank, the location of the water lines and where samples are being collected is sufficient.

Once you have a map of the water system, it is time to locate and create a list of microbiological sampling points. Begin by getting a list of the existing *ROUTINE* microbiological sample locations and IDs from the Southwest Regional Office and identifying those locations on your map. Each sample site will have a "Sample Location ID". In the department's computer tracking system the ID links the location/address description of current monitoring sites to the history of monitoring results for each particular location. Therefore, Sample Location IDs cannot be reused, changed or removed once they have been established. You may discontinue using any existing site. New sites can be added by choosing a new Sample Location ID for each site and recording it on the plan and the card that accompanies the sample to the lab.

After you have identified existing *ROUTINE* and *REPEAT* microbiological sampling locations on the map of the water system make a complete list of *ROUTINE* and *REPEAT* sample locations including IDs and address information. After the map and list are complete, it is time to consider the following conditions and make any necessary improvements or add new sample locations to your existing sample plan:

- **Are all *ROUTINE* sample sites located in the distribution system?** All *ROUTINE*, microbiological samples **must** be taken from the distribution system. *ROUTINE* microbiological samples are not to be collected from a well. All samples from the water system's well(s) must be marked as either a *REPEAT* or *SPECIAL* sample.
- **Are at least five *ROUTINE* sampling points identified on the map?** All water systems should select at least five *ROUTINE* sample sites. This includes systems that are required to collect only one *ROUTINE* sample per month. Even those systems are required to collect five *ROUTINE* samples in the month following a coliform-positive sample. If your system does not have five different locations from which microbiological samples can be collected

during the month following a coliform-positive sample, the water system may collect one sample at each different sampling location per day until five *ROUTINE* samples have been collected over several days.

- **Has a different *ROUTINE* sampling site been identified for each sample that is required to be collected on the same day?** Water systems should identify at least as many *ROUTINE* sample sites as the maximum number of samples they are required to collect on any one day. For example, if your water system is required to collect 20 *ROUTINE* samples per month with 10 samples required every other week, you should identify at least 10 *ROUTINE* sample sites.
- **Are the identified *ROUTINE* sample locations spread out throughout the entire water system?** A sample site should be included for each part of the water distribution system that is normally isolated from the rest of the system. Systems that are completely interconnected can choose routine sample sites from each geographical area. For example, a subdivision or city that is more or less square might choose one site in the center of the area served and one each in the northwest, southwest, northeast and southeast quadrants.
- **Do the sample locations have a smooth nosed cold water only tap? Try to choose sampling locations in the following order of preference:**
  1. Smooth nosed cold water only tap located indoors.
  2. Freeze proof cold-water taps, which extend outside through a building foundation.
  3. Hot and cold mixing faucets (screen or aerators removed).

DO NOT USE FREEZE-PROOF YARD HYDRANTS. Avoid collecting samples at leaking faucets or at outside foundation taps that are close to the ground.

- ***REPEAT* samples must be collected within 24 hours of notification by the department that a coliform-positive sample has been received. *REPEAT* samples must be collected as follows. For systems that are required to collect ONE ROUTINE sample per month:**
  1. One *REPEAT* sample must be collected from the original sampling location that produced the coliform-positive sample.
  2. One *REPEAT* sample must be collected from a location within five service connections upstream of the original sampling location which produced the coliform-positive sample.
  3. One *REPEAT* sample must be collected from a location within five service connections downstream of the original sampling location which produced the coliform-positive sample.
  4. A fourth *REPEAT* sample must be collected from anywhere else within the system. It is strongly recommended the fourth sample be collected from the well.

**For systems that collect MORE THAN ONE ROUTINE sample each month:**

5. One *REPEAT* sample ***must*** be collected from the original sampling location that produced the coliform-positive sample.
6. One *REPEAT* sample ***must*** be collected from a location within five service connections ***upstream*** of the original sampling location which produced the coliform-positive sample.
7. One *REPEAT* sample ***must*** be collected from a location within five service connections ***downstream*** of the original sampling location which produced the coliform-positive sample.
8. It is ***strongly recommended*** that a fourth sample be collected from the well.

If you need technical assistance developing the microbiological sample siting plan please contact the Southwest Regional Office Public Drinking Water Staff at (417) 891-4300. After the microbiological sample siting plan is complete and meets all of the above requirements, please send a copy to:

Missouri Department of Natural Resources  
Southwest Regional Office  
ATTN: Public Drinking Water Unit  
2040 West Woodland  
Springfield, MO 65807

A copy of the completed plan should be easily accessible to all those collecting samples and operating the water system. A copy of the plan must also be made available to the department upon request at which time the department will either approve the plan or recommend changes.

Attached you will find blank copies of the following to assist you in developing your Microbiological Sample Siting Plan:

1. Microbiological Sample Siting Plan.
2. A table for you to list your system's *ROUTINE* Microbiological Sampling Points.
3. A blank copy of the Bacteriological Water Analysis sample card that must accompany each sample bottle.
4. Detailed instructions for completion of the Bacteriological Water Analysis sample card.



SEE REVERSE SIDE FOR INSTRUCTIONS

|                           |   |  |                             |   |   |      |                     |                   |
|---------------------------|---|--|-----------------------------|---|---|------|---------------------|-------------------|
| ▲ LAB USE ONLY ▲          | <b>PUBLIC WATER SYSTEM NAME AND ADDRESS</b> |  |                             | BOTTLE NO.  |   |      |                     |                   |
|                           | SUPPLY NAME                                 |  |                             | SPRINGFIELD-GREENE COUNTY HEALTH CENTER<br>ENVIRONMENTAL LABORATORY<br>BACTERIOLOGICAL WATER ANALYSIS |   |      |                     |                   |
|                           | STREET ADDRESS                              |  |                             |   |   |      |                     |                   |
|                           | CITY  |  |                             |   |   |      |                     |                   |
|                           | COUNTY                                      |  |                             | CHLORINE RESIDUAL (AT COLLECTION POINT)   |   | FREE |                     |                   |
|                           |   |  | mg/l                        |   | TOTAL   |      |                     |                   |
|                           |   |  |                             | mg/l  |   |      |                     |                   |
| <b>COLLECTION POINT</b>   | <b>SAMPLE TYPE</b>                          | REPEAT LOCATION (CHECK ONE)<br><input type="checkbox"/> Original<br><input type="checkbox"/> Up<br><input type="checkbox"/> Down | <b>SAMPLE DATE AND TIME</b> |   |   |      | COLLECTED BY        |                   |
|                           | ROUTINE                                     |  | MO                          | DAY   | YR  | TIME |                     | DAYTIME PHONE NO. |
|                           | REPEAT                                      |  |                             |   |   |      |                     |                   |
|                           | REPLACEMENT                                 |  |                             |   |   |      |                     |                   |
|                           | SPECIAL                                     |  |                             |   |   |      |                     |                   |
| <b>SAMPLE LOCATION ID</b> |   |  | PWS ID                      |   | <b>ANALYSIS RESULT</b>  |      | <b>LAB USE ONLY</b> |                   |
| PLEASE RETURN BOTH COPIES |   |  |                             |   | <input type="checkbox"/> Coliform Absent <input type="checkbox"/> E.coli Absent<br><input type="checkbox"/> Coliform Present <input type="checkbox"/> E.coli Present <input type="checkbox"/> _____<br><input type="checkbox"/> Over 30 hours; Unsatisfactory |      |                     |                   |

**INSTRUCTIONS FOR COMPLETION OF THE  
BACTERIOLOGICAL WATER ANALYSIS CARD**

**WRITE LEGIBLY – IN INK**

**Public Water System Name and Address** - The complete name and address of the water system.

**Bottle Number** - Enter the bottle number from the sampling container.

**Chlorine Residual at Collection Point** - If the sample is taken from a chlorinated supply, measure Free and Total Chlorine Residual at the collection point and enter amounts in the appropriate space.

**PWS ID NO.** This is your 7-digit Public Water Supply identification number.

**Sample Location ID** – ID number from your Microbiological Sample Siting Plan to identify ROUTINE sample siting points. Also used to tie repeat samples to the original coliform-positive sample. The ID number can be up to 10 characters.

**Collection Point** – Specific Street or 911 address; if not available, the name of the collection point.

**Sample Type** - Check the box that coincides with the type of sample taken.

**Routine** – Regular monthly samples.

**Repeat** – A series of three or four repeat samples must be taken for each sample that tests positive for coliform. All repeat samples must be taken on the same day and within 24 hours of being notified of the coliform-positive sample. Take one from the site of the original bad sample, one within five service connections upstream and one within five service connections downstream. The fourth sample, if required, can be taken from anywhere within the system. It is strongly recommended the well be used as the fourth sampling site.

**Replacement** – All invalid samples (i.e. a sample exceeds holding time, leaked in transit, insufficient sample information, insufficient volume, etc.) must be replaced with a single sample from the same location within 24 hours of being notified.

**Special** – Special purpose samples that cannot be used to determine compliance with the MCL for total coliform. I.e. samples to check disinfection practices on repairs or new construction.

**Sample Date** - Use two digits for month, day and year. May 1, 2006 would be written 05 01 06.

**Sample Time** - Use 24-hour clock time (also known as military time) to record the time a sample was collected. A sample taken at 2:30 p.m. would be entered as “1430”, or 2:30 plus 12 hours = 1430 hours. Any sample collected before noon is considered collected in the a.m.

**Collected By** - The name of the person who collected the sample.

**Daytime Telephone** - A complete daytime telephone number for the sample collector.