

# A Basic Site Sampling Plan

A basic site sampling plan may have three components: a map of the distribution system; a narrative description of the plan; and a maintenance program.

**Distribution system map:** This map provides the layout of the distribution system and shows:

- All water sources and their entry points into the distribution system.
- The area served by each water source (if the water from the various sources is not combined prior to distribution).
- Treatment facilities, such as filtration and disinfection.
- Storage tanks and reservoirs.
- Pressure reducing stations.
- Booster pump stations.
- Pressure zones.
- *Routine* sampling sites.
- *Repeat* sampling sites.
- Interconnections and critical valves.
- Pipe material and size.

- Hydrant locations.
- Location of blowoffs/flushing points.
- Dead-end mains and/or known trouble areas.

**Plan narrative:** The description of the site sampling plan includes:

- Water system name and contact person(s).
- Water system seven-digit identification number.
- Water source name(s).
- Storage/reservoir volume.
- Treatment plant description (process used, source[s] treated, location, etc.).
- Total population served.
- Number of service connections.
- Number and area of pressure zones, with population and service connections in each zone.
- Description of sampling rotation within a community, area, etc. This is especially important if the site plan incorporates large areas such as rural water systems.

**Maintenance program:** This section of the site sampling plan identifies:

- The minimum number of *routine* samples required per monitoring period.
- The number of *routine* sample sites needed to represent all distribution areas and all areas of concern.
- The location of all *routine* sampling sites needed to cover all areas in the distribution system. (The address of each site should be listed here, and the sites should be identified on the distribution system map.)
- Sample collection schedule (for systems that collect more than one sample per month). Samples should be collected at regular intervals, not all on the same day.
- Monthly rotation cycle (if applicable). It is desirable to rotate through each sample site three or four times a year.
- A description of the five *routine* sampling sites that will be used for *routine* sampling the following month after the presence of coliforms has been confirmed.
- A brief description of the sample collection techniques used. This will help avoid false positives due to improper collection techniques.
- The schedule for flushing the distribution system's lines. This procedure is vital in reducing the possibility of coliform and biofilm buildup. Systems that have dead-end lines should flush regularly.
- The name and telephone number of the person who prepared the site sampling plan.
- The date the site sampling plan was prepared (and revision date if applicable).

## Sampling Sites

Sampling sites specified in the sampling plan should be selected carefully throughout the distribution system to represent the varying conditions that occur there. (See Figure 1 on the next page for examples.) It is especially important to identify and include in the sampling plan areas that may adversely affect the microbiological quality of the water. These include cross connections, varying population densities, low-pressure zones, sites of deteriorating water mains, shared connections, and areas of low-velocity water movement.

Customers' faucets and specially installed sampling taps are the two most common types of sampling sites. Customer faucets may not always be

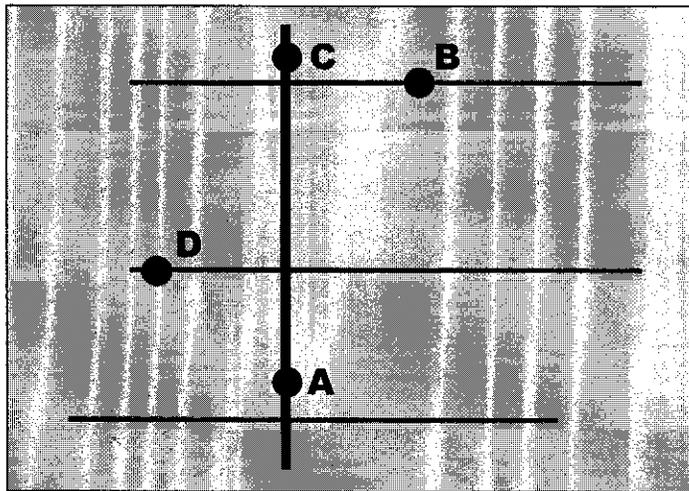
conveniently accessible. Also, samples from a customer's faucet may not accurately reflect distribution system conditions, for reasons that have to do with the customer's plumbing, which are not under the water supplier's control. If customers' faucets are to be used, each faucet should be

examined carefully to ensure its suitability. Some examples of **undesirable** conditions are:

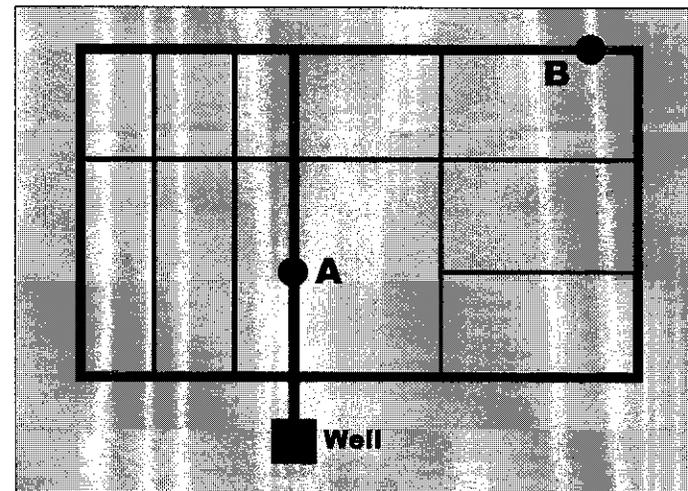
- Swivel-type faucets that have a single valve for hot and cold water.

**Figure 1**

**Examples of Sampling Locations Based on System Characteristics**



Providing samples that are representative of all the conditions in a system that has a number of branch lines with dead-ends, such as this one, might require four sampling locations: **A** gives a sample representative of conditions along the distribution system's main line. **B** provides a sample that represents conditions along one of the branch lines. Samples taken at **C** show conditions near the dead-end of the main line, while samples from **D** are representative of conditions near the dead-end of a branch line. (Adapted from *A Guide to Bacteriological Sampling of Public Water Supplies*, Virginia Department of Health, January 7, 1998.)



Looped distribution systems such as this one allow water to flow freely in all directions. In this system, only two sampling locations are necessary to provide samples representative of the main loop (**A**) and the branch loop (**B**) conditions. (Adapted from *A Guide to Bacteriological Sampling of Public Water Supplies*, Virginia Department of Health, January 7, 1998.)

- Faucets that have leaky packing material around the stem.
- Faucets that supply areas, such as janitorial or commercial sinks, where bacterial contamination is likely.
- Faucets close to or below ground level.
- Faucets that point upward.
- Faucets that have threads on the inside of their spouts.
- Faucets that have aerators. (If such faucets are to be used, the aerators must be removed before a sample is collected.)

To avoid the problems inherent with customer faucets, many water suppliers collect water samples for coliform analysis from special taps connected directly to distribution pipes. These special taps can be simply a faucet at the end of a riser pipe connected to the distribution line, or a more sophisticated manufactured sampling station installed at the water meter or into the distribution main.

