

# Guidance for Bacteriological Sample Collection Standard Operating Procedures (SOP)

## Sample Site Selection Process

- Select a faucet with the following features:
  - Free of leaks;
  - A downward-facing outlet at least 18 inches above the floor or ground;
  - Constructed of materials that will allow it to be heated with a torch or cleaned with a strong bleach (chlorine) solution;
  - Free of obstructions such as tall grass or shrubbery; and
  - Free of any attachments such as a water hose, water softener, aerator, etc.
- Collect from a sample location identified in the system's coliform Sample Siting Plan (SSP).

## Sample Bottle Storage

- Use only sterile bottles obtained from a laboratory accredited by TCEQ to perform total coliform and *E. coli* testing on drinking water.
- Ensure that extra bottles are on-hand in case of sampling issues.
- Do not use any bottles that are:
  - Damaged;
  - Opened;
  - Expired; and/or
  - Obtained from a laboratory that has not been accredited by TCEQ.
- Store unused sample bottles in a cool, dry area away from high heat, damp conditions, direct sunlight, or contact with contaminants.

## Before Sample Collection

- Ensure that hands are washed thoroughly before collecting a sample.
- Wear personal protective equipment (PPE) such as nitrile (or latex) gloves to provide extra protection against contamination.
- Decontaminate the sample tap by flaming the tap with a torch or disinfecting with a strong bleach solution.
  - Flame disinfection is preferable as it works immediately.
  - If utilizing a bleach solution, ensure that it is in contact with the sample tap for several minutes before flushing.
- Allow the sample tap to run (flush) for 5 minutes after decontamination and before collecting a bacteriological sample.
  - Flush the tap until the water produced is cold and has a detectable chlorine residual (free or total).
- Measure the disinfectant residual and record this value in the space provided on the Microbial Reporting Form (MRF).
- After flushing, reduce the flow of water to a smooth, pencil-sized stream to avoid splashing during collection.

## Sample Collection

- Use caution when sampling on windy or rainy days.
- Never rinse or overfill the sample bottle.
  - The bottle contains a tablet, powder, or liquid that acts as a de-chlorinating agent.
  - Rinsing or overfilling will remove or dilute the dechlorinating agent.
  - Without a dechlorinating agent, the sample may arrive at the laboratory with a chlorine residual which will cause the sample to be rejected.

- Do not touch the inside of the sample bottle or its cap.
- Do not place the sample cap on the ground during sample collection.
  - Hold the cap in your hand with the interior surface of the cap facing down during sample collection.
- Treat the bottle with care to maintain sterility.
- Fill the sample bottle to slightly over the marked 100 milliliter (mL) line.
  - The sample should be slightly over the 100 mL line and below the neck of the bottle.
  - This provides the laboratory sufficient volume to perform testing for absence of a chlorine residual as well as maintaining sufficient volume (100 mL) for testing for coliform bacteria
  - Inappropriate sample volume will cause the sample to be rejected by the laboratory.

### **After Sample Collection**

- Immediately place the samples in an ice-chest cooled using reusable ice packs.
  - Avoid using ice, if possible.
    - If ice is used, place the sample bottle in a clean waterproof plastic bag and ensure the top of the bag is sealed and not submerged in water created by melting ice, as this could potentially contaminate the sample.
  - Do not transport or store drinking water samples with non-potable water samples.
  - Do not allow samples to freeze.
- Verify that the bacteriological MRF is completed correctly.
  - Public Water System (PWS) ID number is accurate.
  - Sampler name and signature are included.
  - Time and date of sample collection are included.
  - Field measured chlorine residual is included.
  - Sample type is identified.
    - Compliance: Raw, Repeat, or Routine.
    - Non-compliance: Special or Construction.
- Ensure the sample is received by the laboratory in a timely manner. Deliver samples to the lab the day of collection if possible or ship via overnight delivery.
  - Samples deemed too old or improperly preserved (if applicable) will be rejected by the laboratory.
    - Verify sample hold times with your accredited laboratory. Maximum hold time for drinking water samples is 30 hours from collection to beginning of incubation.
  - Rejected samples must be recollected within 24-hours. If your local, accredited laboratory is closed and the sample cannot be resubmitted within 24-hours, contact the TCEQ for guidance.

### **Special Circumstances**

- If a replacement sample is required for a rejected sample, ensure the MRF is completed properly.
  - The sample should be listed as the same type as was rejected.
    - If a “Routine” sample was rejected, its replacement should also be marked “Routine”.
  - The “Replacement” box must also be checked.
- If a routine sample is positive for total coliform bacteria and/or *E. coli*.
  - Collect three repeat samples according to your Sample Siting Plan.
    - One sample from the original sample site,
    - One sample upstream within five connections of the original sample site, and
    - One sample downstream within five connections from the original sample site.
  - Continue collecting repeat samples until a full set are negative for both total coliform bacteria and *E. coli*, or until a treatment technique exceedance triggers an assessment.
  - If the system uses active groundwater wells, collect raw samples from all wells that were in use at the time of the routine distribution positive sample. One raw well sample per well is required for each routine distribution positive sample. If a well was not in use within 24 hours of the routine distribution positive sample and is listed as active in Texas Drinking Water Watch, please send supporting documentation (e.g. well production log) to [GWRData@tceq.texas.gov](mailto:GWRData@tceq.texas.gov).
- The sample ID of the originating sample must be included for all replacement, repeat, and triggered raw samples