

Water Quality Parameter Sampling Example Standard Operating Procedure

Note about Customizing the SOP: Properly written and effective SOPs contain elements that provide additional information, other than what is provided here, such as personnel qualifications, and record keeping procedures. To prepare SOPs, use the [EPA Guidance for Preparing Standard Operating Procedures](#)¹ QA/G-6 located on the EPA webpage.

Scope and Applicability

The Lead and Copper Rule (LCR) requires public water systems (PWSs) to sample WQPs to determine if their drinking water is corrosive or aggressive. The information in this SOP provides the foundational steps for WQP sampling. It includes the minimum requirements to ensure PWS sampling personnel correctly measure pH and temperature in the field; as well as properly collect, document, and handle WQP samples. Texas Commission on Environmental Quality (TCEQ) requirements are also included.

Procedure

When to Collect

Confirm your system's current WQP Schedules on [Drinking Water Watch](#)² (DWW) before sampling.

Review both the WQP1 schedule for your entry point(s) (PBCU0##) and the distribution system (DS01).

- WQPs are based on a six-month (6M) monitoring period.
- Collect **half** the posted sample requirement in **each** quarter of the 6M monitoring period.
 - 6M1 (Results due to TCEQ by **July 10th**)
 - Quarter 1 (January 1st – March 31st)
 - Quarter 2 (April 1st – June 30th)
 - 6M2 (Results due to TCEQ by **January 10th**)
 - Quarter 3 (July 1st- September 30th)
 - Quarter 4 (October 1st- December 31st)

Collect early during each quarter in case samples are rejected, documentation needs corrections, or sample recollection is needed.

¹ epa.gov/quality/guidance-preparing-standard-operating-procedures-epa-qag-6-march-2001

² dww2.tceq.texas.gov/DWW/

Laboratory Selection

Select a laboratory that is NELAP accredited and approved by TCEQ to analyze WQP samples.

- A [Water Quality Parameters Testing Laboratories Map](#) is available on the TCEQ Drinking Water Lead and Copper Program website ³.

Sample Containers

Use the sample containers provided by the laboratory. Containers should be:

- Free of contamination
- Correct size (either 500 mL or 1 liter)
- Made of laboratory grade plastic
- Correct number to perform the required analyses.

Order bottles early to avoid potential supply shortages or delays.

- The laboratory may provide two containers per sample site so laboratory staff can preserve them separately at the time of receipt. They will count as one sample.
- A laboratory may provide a single sample container of sufficient volume for all analyses. They will split the sample in-house, preserving a portion of the sample for metals analysis.

Sample Locations

Collect Distribution System (DS01) WQP samples at active service connections.

- Representative of the water quality throughout the system.
- Usually locations used for bacteriological monitoring.
- Sites do not need prior TCEQ approval.
- Samples should be taken by the PWS, not the homeowner or resident.

Collect Entry Point (PBCU0##) WQP samples where finished water enters the distribution system.

- This location should be a point after all treatment has occurred. These are not raw water samples.
- Confirm all active entry point locations for the PWS on DWW.

Sample Label(s)

Ensure that each sample container has a sample label. Laboratories can provide sample labels or the PWS can provide their own labels.

The following information is included on each label.

- PWS ID Number
- Date and time of sample collection
- Sampler's initials
- Sample location address

Record the required information legibly on each sample label with waterproof ink at the time of sample collection.

³ https://www.tceq.texas.gov/drinkingwater/chemicals/lead_copper

WQP Monitoring Form

Complete the WQP Monitoring Form (WQPMF) at the time of sample collection.

- Laboratories will provide the TCEQ WQP Monitoring Form (Form 20679) or a WQP Monitoring form which they have adapted and received approval of from the TCEQ prior to distribution.
- If PWS personnel are measuring pH and temperature in the field, ensure the Lab Approval ID is included on the WQPMF, found on the sample collector’s Laboratory Approval Form 10450

TCEQ Official Use Only		
Date Received:	Reviewed by:	Lab ID No:

TCEQ-10450 (Revised 08/2019)

Use Table 1 below to check the boxes on the form indicating which WQP analytes must be analyzed, depending on the inhibitor (if any) used.

Review the WQPMF for accuracy and completeness before submitting samples to the laboratory.

Complete the laboratory Chain of Custody (COC), noting relinquishment and receipt of samples from sampling personnel, couriers, and laboratory staff.

- Ensure the COC is complete with signatures, dates, and time stamps before submitting samples to the laboratory.

Table 1. WQPs to be Monitored and Reported

Analyte Code	Analyte Name	Holding Time
1927	Total alkalinity	14 days
1919	Calcium	6 months (after acid preservation)
1017	Chloride	28 days
1064	Conductivity	28 days
1915	Total hardness	6 months (after acid preservation)
1028	Iron	6 months (after acid preservation)
1032	Manganese	6 months (after acid preservation)
1925	pH (field measurement)	-
1052	Sodium	6 months (after acid preservation)
1055	Sulfate	28 days
1996	Temperature in Celsius (field measurement)	-
1930	Total dissolved solids (TDS)	7 days
1044	Orthophosphate (measured if an inhibitor containing a phosphate compound is used)	48 hours
1049	Silica (measured if an inhibitor containing a silicate compound is used)	28 days

Quality Control

pH and Temperature Measurement

1. Calibrate the pH probe and thermometer according to approved methods and manufacturer instructions.
 - Calibrate indoors (in a temperature-controlled environment) prior to the sampling day, or prior to each sampling event, if conducting only one sampling event per day.
 - Equipment must be capable of measuring both pH and temperature to 1/10 of a unit.
 - Secure the pH probe during transport. The probe's membrane is delicate and should not come in contact with hard surfaces or be allowed to dry out. Keep replacement probes on hand.
2. Measure pH and temperature at each distribution and entry point WQP sample site within 15 minutes of sample collection.
3. Before taking temperature and pH measurements, run the water to fully flush the line (5 minutes).
4. Rinse the pH probe with sample water. Insert the probe into the sample immediately after filling the bottle and record the temperature after the meter reading stabilizes. Change the meter to measure pH and gently rotate the bottle until the pH reading stabilizes. This may take several minutes. Rotate the bottle gently to minimize carbon dioxide entrainment.
5. Record the pH and temperature measurements to the nearest tenth of a unit on the WQP Monitoring Form. Temperature must be measured and reported on the COC in Celsius. Include the date and time of each measurement.

Note: Sampling personnel must measure temperature and pH using the approved methods listed in 30 TAC 290.119, listed in their lab approval form, and monitoring plan on file with TCEQ. If sampling personnel follow these steps, they will meet both the method requirements, as well as the minimum PWS operating practices required by 30 TAC Section 290.46.

Sample Collection

The following steps describe the proper method for collecting a WQP sample from either an entry point or the distribution system.

1. Open the water tap to a gentle flow. You do not need to flush the tap because it was fully flushed prior to taking field measurements.
2. Fill the sample container(s) leaving a small amount (approximately an inch) of airspace. Space is needed so the sample can be shaken prior to sample preservation and analysis.
3. Inspect samples for broken containers, leaks, etc. and place them in zip lock bags on ice immediately following collection.
 - If a bottle is broken or a leak is detected, discard and resample.
4. Store samples in a cooler on ice for delivery to the laboratory.

5. Complete all sample documentation (i.e., sample label, WQF Monitoring Form, and COC form, if applicable); and review it for completeness and accuracy and put it in a zip lock bag. Tape the zip lock bag with the documentation to the inside of the cooler.
6. Deliver (or ship) samples to the laboratory listed in your monitoring plan as soon as possible after sample collection to meet sample holding times.
7. If delivering samples in person, work with the laboratory to locate any issues with documentation and resolve them while still on site. If shipping, follow up with the laboratory to ensure they were received and accepted.
 - If there are sample issues (like pH and temperature not measured in the field, leaking containers), the laboratory will reject the sample and request a replacement.

Note: Samples must be received at the lab the same day or the next to ensure the laboratory can meet the regulatory holding times. This particularly applies to orthophosphate, if analyzed. See Sample Holding Times in Table 1. In all cases, coordinate sample deliveries with the laboratory in advance, so they are prepared for your samples.

Sample Relinquishment

Confirm the following items at the time of sample relinquishment (if delivering samples in person):

- Condition upon receipt is acceptable (holding times and temperatures)
- All needed fields of WQMPF 20679 are legible and complete
- Sample meets laboratory sample acceptance policy criteria
- Confirm reporting deadline for the samples
- Confirm expected turnaround time for reporting results to TCEQ
- Potential additional fee structure for rush samples/form corrections
- Lab has good contact information should any delays/sample rejections occur

Sample Holding Times

Follow the regulatory holding times that apply to WQPs that are referenced in Table 1.

- Holding time is the maximum amount of time, from sample collection to laboratory preparation or analysis, allowed for samples to be considered valid.

Sample Storage and Transport

Refer to laboratory requirements for acceptable preservation and storage for transport to meet appropriate arrival temperature ranges.

Confirming Receipt of WQP Results

Confirm all WQP results were accepted by TCEQ prior to the end of the monitoring period.

- If some or all results are missing, first contact the laboratory to confirm samples were reported or will be reported by the deadline.
- If the laboratory confirms results were submitted to TCEQ, contact the TCEQ Lead and Copper Monitoring Team (PWSLCR@tceq.texas.gov)