

STANDARD OPERATING PROCEDURE

Weekly Compliance Sampling

SOP-S-1 Weekly Compliance Sampling

Location:	
Collecting and measuring weekly samples in the distribution system	<p>SOP #: SOP-S-1-Weekly Compliance Sampling</p> <p>Issue Date: March 31, 2023</p> <p>Date Revised: June 04, 2024</p> <p>Revision #: 3</p> <p>Emergency Contacts: Superintendent 902-305-3192</p>
Prepared By:	Approved By:
CWRS	Gary West

Section 1: Purpose

The purpose of this procedure is to outline the steps for weekly monitoring and sampling from the distribution system, as required by the interim regulations.

Section 2: Definitions / Acronyms

COC Chain of Custody
PPE Personal Protective Equipment
SOP Standard Operating Procedure

Section 3: Roles & Responsibilities

Everyone is responsible for making sure SOPs are followed safely.

Role	Responsibilities
Operator	Collect weekly drinking water samples at designated sites in the distribution system and fill out log sheets. Report any safety and/or training deficiencies and participate in reviews.
Service Area Supervisor	Help operators collect weekly compliance samples if needed and make sure they are following the SOP. Make sure operators are recording their weekly samples in their log sheets.
Superintendent of Operations	Make sure operators are trained and are following SOPs correctly. Revise SOPs annually and make sure they are up to date.
Regulatory Compliance Coordinator	Regularly check WaterTrax to ensure systems are in compliance. Take corrective action if systems are non-compliant. Review log sheets every quarter.

STANDARD OPERATING PROCEDURE

Weekly Compliance Sampling

Director of Operations Engineering and Compliance	Make sure SOPs are followed correctly. Revise SOPs annually and make sure they are up to date.
--	--

Section 4: Required PPE

Below is a list of PPE that must be worn at all times when following this procedure:

- Steel Toed Boots/Shoes
- Nitrile Gloves
- Safety Glasses/Goggles

Section 5: Materials / Equipment

NOTE: Make sure your Field Kit is stocked by checking the inventory list in your kit.

Make sure you have the following items available before starting this procedure:

- For Chlorine Residual:
 - Hach DR900
 - 10-25 mL Sample Cell
 - Swiftest Chlorine Dispenser
 - Swiftest DPD Chlorine Powder
 - DPD Chlorine Powder Pillows (if no dispenser powder)
- For Turbidity:
 - Hach 2100Q
 - 10-25 mL Sample Cell
- For pH/Temperature:
 - Hach pH Pocket Pro⁺ Multi 2
- Kim Wipes (or lint-free cloth)
- Bottles for Bacteriological Samples
- Alcohol Wipes (99% Isopropyl Alcohol)
- Cooler with Ice (sample storage & shipping)

Section 6: Procedure

NOTE: Keep your Field Guide with you when sampling the distribution system. Make sure your instruments are calibrated/validated.

Step 1: Site Inspection

1. For locations where the sample must be collected from a tap, inspect the outside of the faucet. If water leaks around the outside of the faucet, report the leak to a supervisor and coordinate with the supervisor to select a different sampling site.
2. Remove any aerators, strainers, attachments, or purification devices from the tap prior to flushing.
3. DO NOT take samples from a flexible hose or garden hose.
4. If you must use an outside hose bib ensure the entire bib is clean and free of debris.
5. Sample from cold water faucets only.

STANDARD OPERATING PROCEDURE

Weekly Compliance Sampling

Step 2: Chlorine Residual Testing

The Hach DR900 must be validated before samples are measured. Follow SOP-C-1 to validate the instrument.

1. Before you sample
 - a. Turn on the Hach DR900 and select the '80 Chlorine F&T PP' program.
 - b. Open the top cap of the instrument so the sample chamber is exposed.
 - c. Flush the tap for 5 minutes and **record the flush time in your log sheet.**
 - d. After flushing, decrease the water pressure to roughly the width of a pencil.
 - e. Rinse the sample vial 2-3 times with water from your sample point.
2. Zero the instrument
 - a. Fill the sample cell to the 10mL line with tap water and make sure the meniscus is even with the line.
 - b. Screw on the cap and **wipe the outside of the cell with a Kim wipe (or lint-free cloth).**
 - c. Place the sample cell in the Hach DR900 with the triangle mark lined up with the front groove of the sample chamber.
 - d. Place the cap back on the instrument and press ZERO.
 - e. Remove and empty the sample cell.
3. Measure the sample
 - a. Fill the sample cell to the 10mL line with tap water and make sure the meniscus is even with the line.
 - b. Use the Swiftest Dispenser to put one dose of DPD Chlorine powder (or use one powder pillow) into the sample. If using the powder pillow, flick the pack a few times to let the powder settle to the bottom before tearing open.
 - c. Screw on the cap and swirl contents for 20 seconds.
 - d. **Use a Kim wipe (or lint-free cloth) to wipe the outside of the cell** and measure the sample within 1 minute of adding the powder.
 - e. Place the sample cell in the Hach DR900 in the same orientation as before.
 - f. Place the cap back on the instrument and press READ.
4. **Record the value of chlorine residual in mg/L in your log sheet and COC form.**
5. **Interpret the results**
 - **0.20 mg/L or more** – continue with other measurements (turbidity) and collect the bacteria sample.
 - **Less than 0.20 mg/L** – increase flushing time and re-measure chlorine residual.
 - a. Flush water at a higher rate for 10 minutes and record the flush time in your log sheet. Follow Steps 4-7. If the chlorine residual is 0.20 mg/L or more, measure and record the pH, temperature and turbidity data associated with the 10 minute flush and collect the bacteria sample. If the chlorine residual is less than 0.20 mg/L, still record other measurements and collect bacteria sample, but also see next step.
 - b. Flush water at a higher rate for an additional 30 minutes. Measure and record free chlorine and turbidity every 5 minutes. *Sampling the additional parameters can be stopped once/if chlorine residual is measured as 0.20*

STANDARD OPERATING PROCEDURE

Weekly Compliance Sampling

mg/L or more. Two values of 0.20 mg/L or more must be observed in order to stop the 5 minute intervals before 30 minutes

- c. If free chlorine is still less than 0.20 mg/L after 30 minutes of flushing, notify the Service Area Supervisor and Superintendent of Operations.

Step 3: Turbidity Testing

The Hach 2100Q must be calibrated before taking weekly samples. Follow SOP-C-2 to calibrate the instrument.

This test should be run after Chlorine Residual testing.

1. Turn on the Hach 2100Q.
2. After the bulb has warmed up, make sure the line graph in the top left corner of the screen reads "OK". If it does not, calibrate the instrument using SOP-C-2.
3. Rinse the sample cell 2-3 times with water from your sample point.
4. Fill the sample cell to the 10mL line with sample water.
5. Screw on the cap and wipe the outside of the cell with a Kim wipe (or lint-free cloth).
6. Open the top cap of the instrument so the sample chamber is exposed.
7. Place the sample cell in the Hach 2100Q with the white triangle mark lined up with the arrow on the machine.
8. Place the cap back on the instrument and press READ.
9. **Record the turbidity value in NTU in your field log sheet and COC form.**
10. Rinse the sample cell 2-3 times with water from your sample point.

Step 4: Microbiological Testing

1. Before you sample
 - a. Collect the sample in a new, clean, sterilized sample bottle containing sodium thiosulfate preservative (a chlorine neutralizer) provided by the analytical lab performing the analysis.
 - b. Keep sample containers clean and free from contamination before and after collecting the sample. **Do NOT open them prior to collecting the sample.**
 - c. Examine the sample bottle for cracks, a missing seal, a loose cap, internal condensation, or other signs that its sterility may be compromised. If any of these indications are found, discard the bottle and use a suitable one.
 - d. Label the bottle with sampling location, date, and time.
2. Collect the sample
 - a. Before collecting samples, make sure all bottles are correctly labeled. Bottles are hard to label once they are wet.
 - b. After completing the flush and taking all field readings (chlorine residual, turbidity, and pH) turn off the tap. At sampling points where water runs continuously, do not adjust the flow rate.
 - c. Sterilize the faucet outlet by cleaning it with an alcohol wipe.
 - d. After sanitizing, turn on water and adjust the faucet flow rate to approximately the width of a pencil before taking the sample. The flow rate should be low enough to ensure that no splashing occurs as the container is filled. Do not adjust the flow rate while taking the sample.

STANDARD OPERATING PROCEDURE

Weekly Compliance Sampling

- e. **Put on sterilized gloves for sample collection.** New gloves must be worn at each sampling site.
 - f. While holding the sample container at the base, remove the seal around the cap before attempting to open the bottle.
 - g. Remove the cap with the free hand. Be careful **NOT TO TOUCH** the inside of the bottle cap or bottle lip. Continue to hold the cap in one hand with the inside facing down while the bottle is being filled. Do NOT touch the interior of the cap or lay it down. **Do NOT breathe on the bottle or cap.**
 - h. Do NOT rinse the bottle.
 - i. Fill the bottle to the fill line. **Do NOT allow the bottle to overflow.**
 - j. Carefully replace the cap.
 - k. Fill out the COC form and include all required information. All water samples are to be analyzed for total coliform and E. coli. using the Colilert method.
3. Sample Submission, Storage, and Transport
 - a. Keep samples in a refrigerator or cooler with ice packs to maintain a temperature of 4°C until delivered to the lab. Samples are not to be frozen.
 - b. Transport or ship the sample to the laboratory as soon as possible, on the same day of sample collection.

Section 7: Sampling Issues

- While out in the field, if a staff member observes anything out of the ordinary or notes something different at a particular sampling location, staff are expected to **document these issues and observations in their log sheet.**
- Once back in the office, staff are to email the discrepancies to the Service Area Supervisors and make a plan for future sampling.
- If field sampling results yield turbidity values greater than 5 NTU; pH values less than 6 or greater than 10.5; chlorine residual values between 0.2 and 0.22 mg/L; or if measurements are noticeably different from expected or typical results, notification should be provided according to SOP-S-6, Out-of-Range Distribution Results.

Section 8: Data Management

- Field data should be entered into the Chain of Custody form so the lab can upload the data to WaterTrax. The alerts generated from low chlorine residuals provide immediate notification to the Oversight Entity for review.
- Field data and laboratory results are entered into WaterTrax by the laboratory. If a missed sample is identified, the staff will need to complete the required sampling within the same week.

Section 9: Referenced Documents

- SOP-C-1 Hach DR900 Calibration – Chlorine Residual
- SOP-C-2 Hach 2100Q Calibration – Turbidity
- SOP-C-3 Hach pH Pocket Pro⁺ Multi 2 Calibration – pH

STANDARD OPERATING PROCEDURE

Weekly Compliance Sampling

- SOP-S-6 Out-of-Range Distribution Results

Document History Table

Date	Action	By	Revision #
March 31, 2023	Document Creation	CWRS	1
December 28, 2023	Remove reference to pH and temperature collection in the field	JV	2
June 04, 2024	Revise to "Director of Operations Engineering and Compliance"	JV	3