



## DRINKING WATER TREATMENT WITH CHLORINATION SYSTEM: OPERATOR MANUAL

Maintaining water at drinking water quality standard is important to the health of the community. It prevents malnourishment, diarrheal diseases, and other illnesses. This manual discusses the testing parameters required to maintain water suitable for human consumption.

The chart below describes the basic parameters to be monitored to ensure water quality, the suggested limit, what can be used to test, test frequency, why it is important, and how to mitigate.

Parameters	Maximum Suggested Limit	Detection	Frequency	Mitigation	Notes/Rationale
Residual Chlorine	0.5mg/L – 1.0 mg/L	Chlorine test kit	2 days after chlorine is recharged, should be checked at the first, middle and last house/tap stand of the system	Control amount of chlorine added	Usually the closest house will have the highest amount of chlorine and the house farthest away will have the lowest, adjust chlorine level based on need. Levels higher than 0.6 mg/L will affect taste.
Turbidity	<5 NTU (or Secchi disk visibility inside the reservoir)	Secchi disk or equivalent instrument	Before chlorine is recharged, after a big rain event, water should be measured in the reservoir	Sedimentation	If water is being chlorinated, turbid water can decrease the effect of the chlorine. Sedimentation usually occurs in the reservoir.

To ensure source protection, conduct a bi-monthly monitoring of the area, including:

- No latrines, open defecation, animals, trash disposal, vehicle washing/maintenance, and washing within 30-meters of water source
- From water source, no uphill or upstream fumigation or agriculture
- The perimeter fence is secure and no repairs are needed
- Water source remains clean of garbage
- Plants around water source maintained to keep water source easily accessible
- Ensure there are no leaks, all lids are in place with locks and all air vents are screened
- Check cleanout line for blockages

*After the first heavy rainfall, make sure to check turbidity and chlorine levels. Also look for garbage and plants around the water source.*

*Do not forget to conduct required government water quality testing.*



## Troubleshooting:

**-People complaining about strong chlorine taste:** The taste of chlorine can start to be detected at 0.2 mg/L. If the community is saying the water tastes like chlorine, first check the concentration in the first, middle and last house/tap stand of the system. If the concentration is more than 1.5 mg/L, decrease the amount of chlorine being mixed in (see chlorination manual). If you recently started chlorinating, remember it takes time for the community to get used to the taste, add it little by little, eventually reaching the desired concentration and giving the community enough time to become accustomed.

**-Water is discolored:** This could be due to suspended solids. Check the reservoir to see how much sand is on the bottom. Make sure you are cleaning the reservoir once every 3 months. It can be cleaned more often as needed. If there is still a problem with discoloration, take a water sample to get tested for metals. If the source is groundwater, untreated iron can lead to red water and high manganese concentrations can cause black water.

**-Chlorine levels are significantly lower in the last house/tap stand than the first house/tap stand:** This is most likely due to the distribution system having bacterial growth. Conduct a water system disinfection of the reservoir and distribution system.

**-No Secchi disk:** If a Secchi disk is not available to test turbidity, one can be created with an old CD or DVD disk. With a permanent marker, divide the disk into quarters and paint it black and white, as seen in the picture below. Using a 15-meter-long string, put one end through the center of the disk and securely tie it to the disk. Tie it in a way to see the painted side of the disk when it is immersed in water. Also add weighted objects (i.e. washers, PVC pipe) as needed to ensure the disc sinks. At the water storage tank, slowly lower the Secchi disk into the reservoir until it reaches the bottom. At the bottom, if the colored part of the Secchi disk can be seen clearly, the water is not turbid. If it cannot be seen clearly, the water is turbid.

