Drinking Water

Drinking Water

Who to ask: water treatment plant operator

7. Is your water treatment plant attached to a washeteria, clinic or other facility?

☐ Yes ☐ No ☐ ?

Surface water system
Photo Courtesy Kurt Egelhofer

8. Does your water treatment plant get water from?

☐ Well

☐ Spring

☐ Pond, river, stream

There are many benefits of having your water treatment plant attached to another facility such as a clinic or washeteria. If the facilities are combined, it is possible to share operation and maintenance costs. For example, by having one heating source for the facilities to share instead of several different sources, the village saves both energy and money. An example of a community that has combined facilities is the village of Chalkyitsik. In Chalkyitsik, the water treatment plant was connected to both the washeteria and clinic. In this case, the clinic has piped water and sewer and shares the heating with the other facilities.

A water treatment plant either gets water from a well, spring, pond, lake, river, stream or snow catchment basin. Water that comes out of a well is **groundwater**. Water that comes from ponds, lakes, rivers, and streams is **surface water**. A spring can be either groundwater or surface water. Surface water can become polluted easier than groundwater because it is directly exposed to the pollutants we put into the environment. Consequently, surface water systems require more treatment than groundwater systems. Groundwater systems, however, are not safe from contamination. Pollutants can enter the soil and eventually find their way into the groundwater. Contaminated groundwater can be much more difficult to clean in comparison to contaminated surface water.

9. Do most village residents use the water from the water treatment plant?

☐ Yes ☐ No ☐ ?

If you don't like the taste of chlorine in your water, you can solve this by leaving the water in a pitcher or jug for 30 minutes or more. When chlorine gas is dissolved in water, it is similar to the gas in soda pop that makes it fizz. After the water sits for awhile, the chlorine will escape, similar to when a soda loses its fizz and becomes flat. Once the chlorine escapes, you no longer taste it in the water!

The purpose of a water treatment plant is to supply safe and good-tasting drinking water. If village residents are not using the water from the water treatment plant, they may be gambling with their health by getting water from another source.

For example, in some villages, the treated water is cloudy and yet it is safe to drink. Many people, however, prefer river water or chopped ice that "looks" cleaner but may be unsafe to drink.

If there are people in your village who do not use the water from the water treatment plant, find out the reason(s). Sometimes people will not drink the water because they feel that the added chemicals give it a bad taste. When used properly, added chemicals, such as chlorine, can actually improve the taste of water. If taste and smell are common complaints among residents, it would be a good ideas to talk to the water treatment operator to learn more about the chemicals being used and how often. The water treatment operator should be keeping track of their daily routine in a log book. There are also a variety of do-it-yourself home water test kits available that could help ease the concerns that residents may have regarding their treated water and may even help to identify potential issues that may have gone undetected.

10. Do most village residents believe the water from the water treatment plant is safe to drink?

☐ Yes ☐ No ☐ ?

If no, why not and where do they get their drinking water?

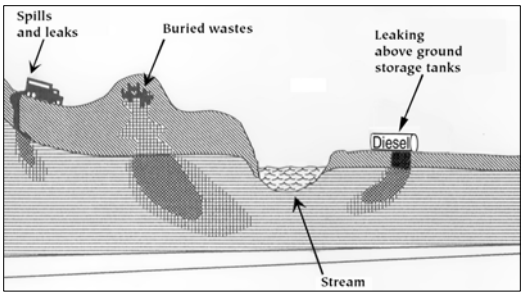
_____

_____

It is important that the village residents know that the water from the water treatment plant is safe to drink. If people do not know and trust that the water is safe to drink, they are likely to drink water from other sources that may be harmful to their health. Finding out why people feel the water is not safe to drink can be a useful tool to educate them about safe drinking water. It may even bring out a problem that exists at the water treatment plant that hasn't been discovered.

Students in Aniak use a water model to learn how materials from the landfill and sewage lagoon can get into drinking water
Photo Courtesy Suzanne Unger

It may be useful to post the results of water testing each day so community members can see that the water is being treated and is safe to drink. If this is done, it is really important that results are easy to understand and that people know what they mean.



11. Do the village residents feel that the sewage lagoon, landfill, old military site, tank farm or other source has an effect on the drinking water supply?

☐ Yes ☐ No ☐ ?

If yes, how?

_____

If village residents feel that the sewage lagoon, landfill, old military site or tank farm is contaminating the drinking water supply, it is likely that they won't drink the water. Find out why people think the water is not safe to drink, so the problem can be addressed. One way to address this problem is by doing routine water testing for contaminants and informing village residents of the results.

12. Does your village's water treatment plant ever run out of water?

☐ Yes ☐ No ☐ ?

If yes, how often and when?

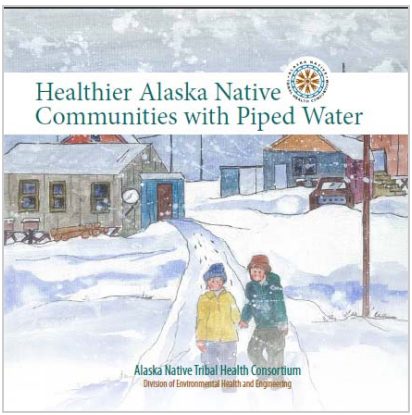
_____

A study from the Centers for Disease Control (CDC) and Prevention's Arctic Investigations program in collaboration with the Alaska Native Tribal Health Consortium found that limited access to in-home water services causes high rates of respiratory and skin infections in the rural Alaska Native population. Research has shown that health benefits are seen when people use at least 8-14 gallons of water per person per day. While some rural residents who have to travel to remote watering point locations to haul their water are reported to use as little as 1.8 gallons of water per person per day, while the average American uses 80-100 gallons per person per day.

A community's health improves as the amount of safe water available increases. When safe drinking water is in limited supply, you have a greater chance of catching diseases from poor hygienic habits and sanitation. Diseases that result from a lack of water tend to be a serious health hazard. When people use very little water, it may be difficult, if not impossible to maintain good personal hygiene. Diseases that affect the eyes and skin may result when limited water is available for washing and bathing. Intestinal infections can also spread much easier from one person to another when water is in limited supply.

There are communities in rural Alaska that experience water shortages every year. If water is in short supply, the community may need to consider the following:

- Investigate the cause of limited water supply. For example, there may be an undetected leak in the system.
- Inadequate water supply. New sources of water may need to be found.
- Limited storage capacity. The storage capacity of the tank used may be too small to serve the entire community.
- Water conservation. Residents may need more information on how to use water safely if treated water is limited in supply or unavailable.



Learn more about the benefits of piped water. Download ANTHC's book from www.anthc.org/cs/dehe/envhlth/ehcoordination/upload/Healthy-Communities-Water-Manual-2.pdf

13. Does your village have piped water to the houses or other buildings?

☐ Yes ☐ No ☐ ?

If yes, how many?

_____

_____

14. Does your village have private wells?

☐ Yes ☐ No ☐ ?

If yes, how many?

_____

The purpose of questions #13–16 is to see what type of water system(s) is in your village. The reason for identifying the drinking water systems and the number of people in the community using them is that the problems associated with each type of system are different.
For example, the potential health problems associated with a piped water system are less than the problems associated with private wells, flush-haul systems and watering points.

Piped water is water that is connected to a water treatment center and piped out to homes and other buildings in the community. In a piped water system where water has been properly treated, there is very little chance of water becoming contaminated before it reaches the user.

Piped water system
Photo Courtesy Kurt Egelhofer

Private wells are not regulated water sources and do not have to meet State of Alaska drinking water requirements. Consequently, private wells have a greater chance of contamination not being detected. The location of the well is a very important factor. Wells should be located, constructed and maintained to reduce the possibility of contamination. Residents who have wells should annually (or more frequently) check the water quality (i.e. bacteria and nitrate levels) to make sure that the water is safe to drink. Fecal bacteria and nitrates in the water indicate sewage contamination.

15. Does your village have a flush-haul water system?

☐ Yes ☐ No ☐ ?

If yes, how many houses or other buildings?

_____

_____

A **flush-haul water system** is a system where water is transported from the water treatment plant or water storage tank to the customer. The water is transported with a truck, trailer, or a snow machine. Each customer has his/her own storage tank that is filled. This system is almost as sanitary as a piped water system as far as providing safe drinking water.

16. Does your village use dip buckets to store drinking water?

☐ Yes ☐ No ☐ ?

If yes, to how many houses or other buildings?

_____

_____

Dip buckets are used in homes of villages with a central watering point. The water treatment plant may have a hose on the outside where you fill your dip bucket. The water contained in a dip bucket is easily contaminated if not handled with great care. The handle, or dipper, used to gather water from the bucket is the main source of contamination. Dip buckets have the greatest potential for contamination of all the drinking water systems mentioned.

Unsafe drinking at the village watering point
Photo Courtesy Oxcenia O'Domin

Village watering point
Photo Courtesy Bill Stokes

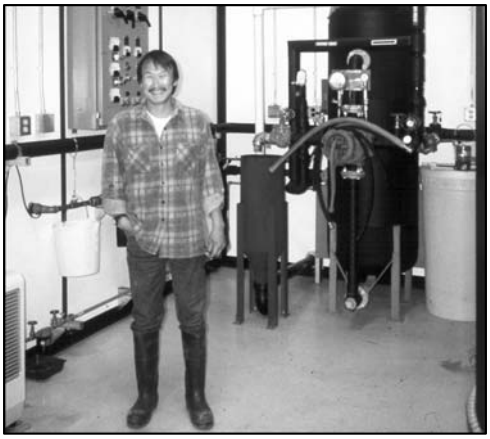
The hose at the village's watering point should not touch the ground or be drank from directly - it can lead to contamination and spread diseases. Cleaning the hose at lease once a day with a weak bleach solution will help kill any possible contaminates. The best strategy, however, is to prevent the hose from touching the ground or walls and educating the community on how to properly use the watering point so it does not become contaminated.

17. Does the water treatment plant have operators?

☐ Yes ☐ No ☐ ?

If yes, how many?

_____



Very few people have more control over the health of the community then the water treatment operator
Photo Courtesy Joe Sarcone

18. Do the water treatment operators get paid?

☐ Yes ☐ No ☐ ?

If yes, how much and for how many hours per day?

_____

_____

_____

A water treatment plant should have operators who are capable of regularly keeping the water safe to drink. There should be two or more operators that run the water treatment plant in the village. If one operator is sick, on leave, or away from the village, another equally qualified operator should be available to take over the duties.

Some ways to help assure you have capable and qualified operators are to require training, certification, and decent pay. The most important factor, however, is getting the community to understand the important role the operator plays in keeping the community safe. Only when this is understood does the operator gain the respect deserved.

An operator's pay should be high enough so that the position is competitive and encourages a high quality operator to stay with the job. A high turnover of operators for the water treatment plant is usually harmful and may create unsafe drinking water.

The community needs to understand that safe drinking water is not a free service. Getting good compensation for the work of operating the water treatment plant provides an incentive for the operator to do a good job and to stay with the job. It also helps give respect to the operator and provides safe water for the community.

19. Are the water treatment plant operators Certified by the State of Alaska?

☐ Yes ☐ No ☐ ?

If yes, when do the certifications expire?

_____

_____

Having a certified water operator is a great benefit to your community
Photo Courtesy Joe Sarcone

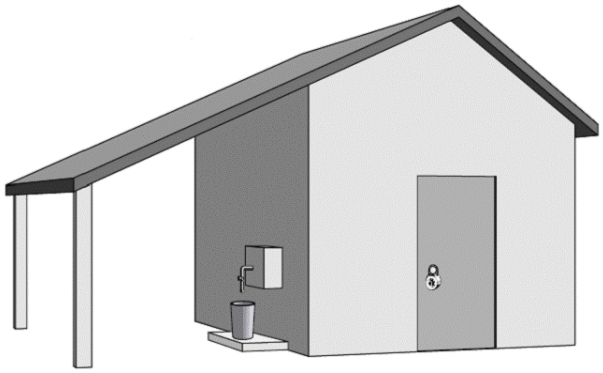
The benefit of having certified/qualified operators is that it gives some indication to your community that the operator is knowledgeable and that the drinking water is properly treated.
Another benefit of having certified operators is that it improves your village's chances of getting state funding for sanitation facilities. The points earned for having trained and certified operators can improve the chance of your village receiving grant money.

While some small systems are classified and require certifications such as "Small Treated" or "Small Untreated", they still require the operator to obtain a "State Certification" and they are required to attend additional training in order to maintain their certification.
The "Provisional Level 1" certification is the minimum certification required by the State of Alaska. It is possible to obtain a Provisional Level 1 certification after completing an approved course and taking the 'Water Operator Level 1" exam. After the operator has completed the required number of hours in the water treatment facility the Provisional Level l certification automatically becomes a Level 1 Certification. Additional training is required in order for the operator to maintain their certification.

It is very important for operators to keep any certifications current. Skilled operators are in high demand in many communities in Alaska. Keeping a certification current can be advantageous for employment and for maintaining one's skills. Having a certified water operator is a great benefit to your community.

20. Is the water treatment plant locked and secure when the operator is not there?

☐ Yes ☐ No ☐ ?



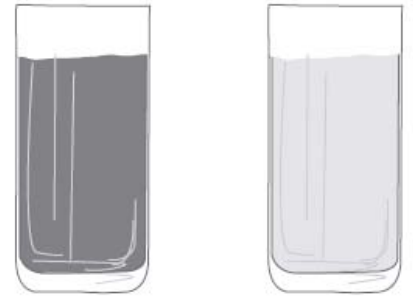
The water treatment plant should be locked at all times when the operator is not in the building. If the doors are unlocked, anybody can enter the building and potentially vandalize the equipment and/or make the water unsafe. Also, if someone enters the water plant and ends up getting hurt or harmed by chemicals, the water plant owner and the operator may both be held responsible for this accident. Keeping the water plant locked is a necessary safety precaution that every operator should practice.

21. If your water treatment center uses surface water, does your operator measure turbidity?

☐ Yes ☐ No ☐ ?

Is the turbidity meter operational?

☐ Yes ☐ No ☐ ?



Water with high turbidity is cloudy

Water with low turbidity is clear

Turbidity is a measure of the cloudiness of the water. Water that is cloudy has a high turbidity and requires more chlorine than water that is clear. If your water has a high turbidity, there is greater risk of the water being unsafe because it will use up the chlorine required to disinfect the water properly. Because the turbidity of surface water changes often, it is very important for the operator to measure turbidity every time water is being made. Check the turbidity meter to make sure that it is operating and has been calibrated (Quarterly) for accuracy.

Most surface water and GUDISW are required to have a water treatment (filtration system) installed, but turbidity tests are still required every day that water is being made.

NOTE: Making water is referring to treating water or to make it potable (safe to drink).

22. If chlorine and/or fluoride are added to the drinking water at the water treatment plant, does the operator have the chlorine and/or fluoride test kits and chemicals to monitor the water quality?

☐ Yes ☐ No ☐ ?

If yes, are there enough chemicals to last for several months?

☐ Yes ☐ No ☐ ?

Are the chemicals still effective? (Check the expiration dates)

☐ Yes ☐ No ☐ ?

Test chemicals expire!
It is really important to check the expiration dates to make sure they are effective.

There are three common tests that the water operator does to monitor the quality of the drinking water: the chlorine test, turbidity and the fluoride test. A chlorine test is done every day, whereas the turbidity and fluoride test is done every time water is being made.

In order to do these tests, the operator must have complete test kits with chemicals that have not expired. The chemicals that are contained in each of the kits have a limited shelf life. There should be enough test chemicals on hand to perform the test for several months. Always check the expiration dates on chemicals to be sure they are still effective.

Photo Courtesy Suanne Unger

Types Of Water Monitoring Tests Required For Surface Water, Groundwater Under The Direct Influence Of Surface Water (GUDISW) and Groundwater Systems:

Type of test(s) required:

Surface water	**GUDISW**	**Groundwater**
Chlorine test (daily)	Chlorine test (daily)	Chlorine test (if added)
*Fluoride test (if added)	*Fluoride test (if added)	*Fluoride test (if added)
Turbidity test (Daily)	Turbidity (daily)	

New regulations set by EPA and ADEC may require more frequent monitoring and reporting for Chlorine and Turbidity. Check with your ADEC Drinking Water Environmental Specialist.

(*Fluoride is not a required chemical for water treatment. However, if fluoride is being added to the water, it must be monitored each time water is being made.)

23. Does the operator take a free chlorine residual test every day?

☐ Yes ☐ No ☐ ?

If not, how often?

_____

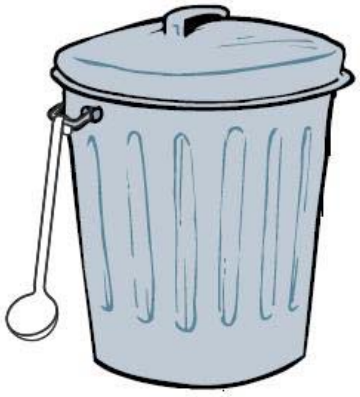
What is the chlorine residual today?

_____

How much chlorine supply does the operator have on hand for use?

____ days ____ weeks ____ months

If there are residents in your community who use dip buckets, it is recommended that a chlorine residual of 0.3 mg/l be maintained in the drinking water system. This number is slightly higher than the amount required to produce safe drinking water. A little higher chlorine residual has a greater chance of keeping the containers disinfected and is not harmful.



Chlorine is a chemical that is added to water in order to disinfect, or kill, pathogens (disease-causing organisms) in the water. In order to be effective, the correct amount of chlorine must be added to the drinking water system. If too little chlorine is added to the system, it will not kill all of the pathogens.

Darcy Kameroff from Russian Mission learns to take a chlorine residual at an Environmental Assessment Training in Aniak
Photo Courtesy Suanne Unger

A chlorine test is an extremely important test that is required in almost all water systems in Alaska. If chlorine is added to the system this test is required to be done every day. In order to find out if the right amount of chlorine is being added to the system, the operator tests for a **free chlorine residual**. A free chlorine residual is the amount of chlorine left over in the water after the chlorine has done its job killing pathogens. Having left over chlorine tells you that there was enough chlorine to get the job done. It is also important that some chlorine remains in the system to provide extra protection against diseases in case pathogens enter into the system.

State regulations require that the operator maintain **at least 0.2 mg/L free chlorine residual at the entry point (first service connection)** which results in only a trace amount of chlorine coming out of the drinking water tap at home. It is a good idea, however, to keep the chlorine residual higher at the entry point so that a 0.2mg/L residual is found in the water at your home or at the watering point. **The maximum allowable free chlorine level is 4.0 mg/l at the entry point.**

Bruce Wright is teaching the use of a chlorine residual instrument

Numbers that are lower than 0.2 mg/L (such as 0.1mg/L) show that there is not enough chlorine being added to the system (this may begin to lead to chlorine taste and odor complaints). However, if the chlorine residual reaches higher numbers such as 0.6 mg/L, the water may also begin to have a bad taste of chlorine. If your water has too much chlorine in it (or to little) you can simply leave it in a pitcher or jug for awhile. After a short time, the chlorine from the water will disappear like fizz from a pop into the air and the chlorine taste will be gone.

TIP FOR FISH CAMP

If you are going to fish camp or away from a reliable source of safe drinking water, you can disinfect your water very easily using household bleach. All you need to take with you is a small container of unscented, regular bleach (enough to contain one or two spoonfuls of bleach) and a medicine eyedropper. For every gallon of clear water you have, add 1–2 drops of bleach. If the water is cloudy, add 2–4 drops. After adding the bleach, you need to mix the solution and let it stand for 20–30 minutes before drinking so that the chlorine has time to kill the pathogens (disease-causing organisms). This will kill almost all pathogens. Also, make sure that you pick your drinking water source carefully!

Chlorine supply

There should be enough chlorine on hand to treat the water for at least 2–3 months. You do not want to risk running out of chlorine. However, having too much chlorine on hand can be hazardous as well. Safety precautions should be put into place to ensure that canisters containing chlorine are secure.
For example: chained to the wall - in case of an earthquake or other unanticipated situation.

24. Does the operator use HTH (chlorine powder) to disinfect drinking water?

☐ Yes ☐ No ☐ ?

If not, what type is used?

_____

If yes, where is it stored?

_____

Is it secure?

☐ Yes ☐ No ☐ ?

CHLORINE CONTAINER SIZE

For safety reasons, when using HTH or chlorine powder, it is preferable to purchase it in small containers, such as the 3 1⁄2 pound to 8 pound size. Smaller containers are easier to use and store and reduce the risk of chlorine exposure to the operator. Containers of chlorine that are 25–100 pounds are potentially very dangerous and have a greater chance of being a health problem to the operator and the community. Each time the operator opens the chlorine container, he/she is exposed to chlorine gas. Chlorine gas can be hazardous or deadly if inhaled in large enough quantities. For this reason, the operator should always wear a respirator mask when working with chlorine. Other safety precautions include wearing rubber gloves to prevent chlorine burns, face shield for eye protection, long sleeves shirt or apron with sleeves and rubber apron to protect your clothing.

The most common method of disinfecting, or treating, water is by adding chlorine. Chlorine for water treatment comes in three forms: gas, liquid and solid. The most common form of chlorine used in rural Alaska is the solid powdered type, calcium hypochlorite which is called **HTH**. HTH contains around 65% chlorine and is dangerous if not handled and stored properly.

It is very important to store HTH in a warm and dry place away from other chemicals. If water is added or spilled on HTH, there will be an uncontrolled release of chlorine gas, which is very dangerous. The lid of the container should be tightly sealed at all times to avoid chlorine gas from escaping. Damaged containers of chlorine (HTH) are dangerous. Chlorine can also react violently when mixed with other chemicals that are not compatible. Chlorine warning signs should b posted in all areas where chlorine is stored.

NOTE: In case of a chlorine fire, use water to extinguish and dilute. Chlorine is an oxidant and creates its own oxygen; it will burn even if it is smothered.

Damaged containers of chlorine (HTH) are dangerous
Photo Courtesy Bill Stokes

25. Is fluoride added to the drinking water?

☐ Yes ☐ No ☐ ?

If yes, how often does the operator do a fluoride test?

_____

_____

What is the fluoride level today?

_____

_____

A water treatment system that adds chlorine and fluoride
Photo Courtesy Bill Stokes

Fluoride is added to drinking water systems to strengthen the growing teeth of children and to reduce dental cavities. It is effective for children up to the age of eight to ten years. If fluoride is used in a drinking water system, it is extremely important that it is added correctly. If it is not added properly, it can be harmful to people. Excess amounts of fluoride can damage teeth and lead to bone disease.

Fluoride is not a required chemical for producing safe drinking water. However, if fluoride is added to the drinking water system, a fluoride test should be done EVERY DAY water is made. The results of the fluoride test should be entered into a log book. If the operator is not monitoring the fluoride level, the water may be unsafe and fluoride use should be stopped. **The fluoride level (residual) should be in the range of 1.1 to 1.7 m /L**. The operator should never allow the fluoride level to be greater than 4.0 mg/L, nor should the level range above 2.0 mg/L for long periods of time.

26. Does the operator maintain a daily log of the water testing results?

☐ Yes ☐ No ☐ ?

When was the last date it was filled in?

_____

Each time the operator tests the water for chlorine, fluoride or turbidity, the results should be recorded on a daily log with the date and time of the test. This record shows whether or not chemicals are properly added and whether water is properly treated in order to make it safe to drink. If the operator is not maintaining a daily log of the water testing results, there is no way to guarantee the operator has been doing his/her job and that the water is safe to drink.

When filling out this survey question (26), make sure you ask the operator to see the daily log. Write down on the survey the last date that the log was filled in. There is sample of a daily long on page 83 of this manual.

27. Are chlorine warning signs posted on the entrance doors to the water treatment plant?

☐ Yes ☐ No ☐ ?

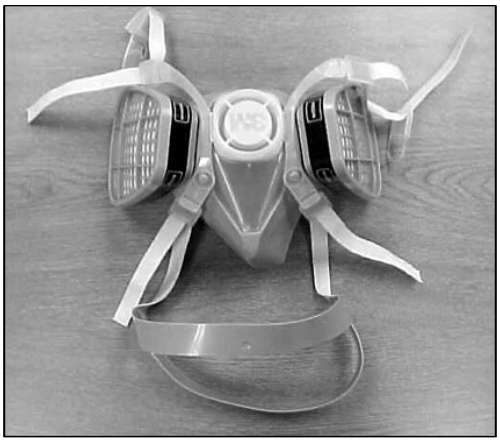
The entrance to the water treatment plant, or any other area where chlorine is being stored, should have warning signs posted along with a Materials Safety Data Sheet (MSDS) for chlorine. The MSDS for chlorine is an information sheet describing the chemical chlorine and how to safely handle it. The fire department requires that chlorine warning signs be posted wherever chlorine is stored for the safety of the handler as well as the community. The reason for this is that if water is sprayed on dry powder chlorine (HTH), there will be a release of chlorine gas. Chlorine gas can be dangerous or deadly if inhaled. HTH is a useful chemical for producing safe water, but it must be handled and stored very carefully. Chlorine is one of the most dangerous chemicals in your community and it needs to be used with caution.

28. Is there a chlorine respirator available for the water treatment operator?

☐ Yes ☐ No ☐ ?

Does he/she use the respirator when handling HTH (chlorine)?

_____



A Chlorine respirator should be used by the operator every time chlorine is being handled
Photo Courtesy Suanne Unger

A chlorine respirator is a type of gas mask used by the operator when working with chlorine. The mask should be worn every time chlorine is handled. New chlorine cartridges (yellow cartridges) should always be available for use. Proper use of the mask will prevent the operator from being exposed to immediate hazards from chlorine and will reduce the long-term health effects from the chemical as well.

Inhaling chlorine is harmful to your lungs. It can make you cough and make breathing more difficult. If too much chlorine is inhaled, it can be fatal. Chlorine can also irritate your eyes. If chlorine comes into contact with your eyes, it can cause painful burns which could potentially lead to loss in vision. For these reasons, it is very important to wear a chlorine respirator when handling chlorine. A chlorine respirator should be used by the operator every time chlorine is being handled.

TIP

The chlorine respirator should be stored away from the chlorine so that it remains effective. Store the respirator in a tightly covered container, such as Tupperware, will help prevent chlorine vapors from getting into the cartridges. If you can smell chlorine in the cartridge of the respirator, this indicates that the cartridge is no longer effective.

29. Are there any pieces of equipment in the washeteria and/ or water treatment plant broken or not operating?

☐ Yes ☐ No ☐ ?

If yes, what are they?

_____

Equipment that is broken or not operating in the washeteria and/or water treatment plant should be fixed immediately, particularly if the parts are necessary to supply safe drinking water.
For example, if a chlorine pump breaks and there is no replacement pump, chlorine will not be added to the water and the water may be unsafe to drink. If a critical part breaks, the operator may not be able to produce safe drinking water.

30. Does the operator have a critical spare parts inventory?

☐ Yes ☐ No ☐ ?

If yes, are all of the parts there?

_____

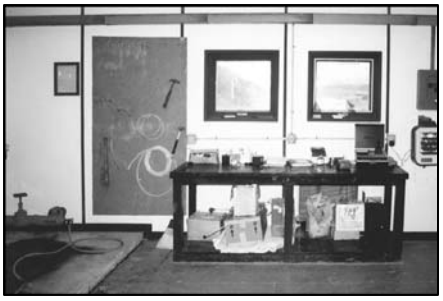
Operators must have a critical spare parts inventory showing all of the equipment needed to safely operate the drinking water facility. For important pieces of equipment, such as a water pump and chlorine pump, there should always be two of each on hand. The Remote Maintenance Workers (RMWs) in each region can be helpful in determining what items should be listed as critical spare parts.

31. Is the washeteria and/or water treatment plant clean and orderly?

☐ Yes ☐ No ☐ ?

If no, describe?

_____



A clean water treatment plant
Photo Courtesy Bill Stokes

A clean and orderly washeteria and/or water treatment plant is often a positive sign of the quality of the operator's work. A dirty facility may indicate that the safety of the water is questionable. A dirty facility may also be hazardous (i.e. misplaced chemicals and equipment left to stumble over).

32. Does the water treatment plant have a written Standard Operating Procedure (SOP)?

☐ Yes ☐ No ☐ ?

Years of experience and skill can be preserved by having a Standard Operating Procedure and master log instead of being lost when an operator quits or retires.

Every water treatment plant should have a written **Standard Operating Procedure** (SOP) posted. A Standard Operating Procedure is a document describing all of the actions required to ensure water is properly filtered and disinfected. It is a step-by-step guide to making safe drinking water that is specific to the water treatment plant in your village. Because every water treatment plant operates a little differently, this "cook book of water treatment procedures" is an important document for training new operators.

A **master log** is a record of all the activities that the operator performs during each workday. It is like a diary of events for the day. It is extremely important for your operator to record all of the things that he/she does while at work in the water treatment plant. This log provides an historical account of the water treatment system. It can be useful for finding problems or errors in the water system, for ordering chemical supplies in the future, and for letting other operators know what has happened in their absence.

Both a master log and a Standard Operating Procedure are valuable tools needed to properly operate a water treatment plant. They are also important records to have in the event that a new operator is hired to operate the system. Instead of re-learning the entire water treatment system and repeating past mistakes, the master log and Standard Operating Procedure allows a new operator to transition into the job easier and makes safe drinking water.

33. Does the washeteria and/or water treatment plant have safety defects?

☐ Yes ☐ No ☐ ?

If yes, what are they?

_____

_____

_____

The washeteria and/or water treatment plant should be inspected periodically to see if there are any safety defects. Examples of some safety defects include bare electrical wires, leaks, and split or cracked chemical containers. These defects should be corrected immediately so they do not present a hazard to the facility or to the people working there. Your Remote Maintenance Worker (RMW) can do an inspection and find any safety defects that may be present.

34. What are your village's main complaints with the washeteria and/or water treatment plant?

_____

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The water at the water treatment plant may be safe to drink, but at the same time has a bad taste or smell. If there are specific complaints regarding the washeteria and/or water treatment plant, these should be brought to the attention of both the operator and the council responsible for maintaining the facility. It is the operator's job to provide safe and good-tasting water to the community.

Sample Water Treatment Daily Log

The following sample daily log includes different components a Water Treatment facility may use. There is no requirement that this particular format be used.

System # _____ Water Treatment Plant System Report Log for the Month and Year of: _____

Day	operator initials	WTP influent meter total reading (gallons)	calculate daily water production (gallons)	WST level (feet)	chlorine residual (mg/l)	chlorine pump setpoints (stroke) (speed)	chlorine mixed? (Y / N)	polyphosphate concentration (mg/l)	polyphosphate pump setpoints (stroke) (speed)	polyphosphate mixed? (Y / N)	operator comments about system performance, Alarms, operational problems, equipment repair needs, material (chemicals, etc.) ordering needs, and any other issues to be documented
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