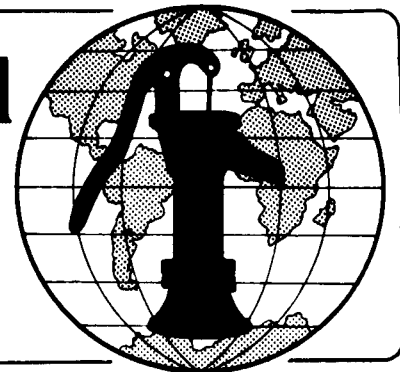


# Water for the World



## Operating and Maintaining Household Treatment Systems

Technical Note No. RWS. 3.O.1

The operation and maintenance of household treatment systems requires the attention of individual families. Proper operation and maintenance will ensure that adequate water treatment is performed and that storage containers are cleaned and protected against the entry of contaminants.

This technical note describes several measures to follow for effective operation and maintenance of household treatment systems. These measures will help maintain good water quality in the household when chlorination, boiling, storage or household sand filtration is used.

### Chlorination

For effective chlorination to take place, sufficient stocks of chlorine should be available and correct chlorine dosages should be applied. The best way to ensure that an adequate amount of chlorine is available is to prepare a large quantity of one percent stock solution and store it in jars in a cool dark place for future use. To determine the amount of chlorine to add to a certain volume of water, use the following formula:

Kg of chlorine required =

$$\frac{\text{Percent strength of solution desired} \times \text{Liters of solution desired}}{\text{Percent available chlorine}}$$

For example, to prepare a 50-liter supply of one percent solution using bleaching powder with 35 percent available chlorine, the amount of powder which must be added to the 50 liters of water is:

$$\frac{.01 \times 50 \text{ liters}}{.35} = 1.4\text{kg.}$$

Thus, 1.4kg of bleaching powder should be added to 50 liters of water to make a one percent stock solution. Using this formula, both larger and smaller volumes of one percent solution may be made. As the stock solution becomes low, be sure that more chlorine is available.

Whenever possible, test the water to ensure that chlorination is adequate. Under most conditions, such testing will not be practical. Check with local health officials to see whether testing kits are available or whether someone from a regional or national center tests water in the area periodically. If testing is impossible, the dosage outlined in "Designing Basic Household Water Treatment Systems," RWS.3.D.1, should prove sufficient.

### Boiling

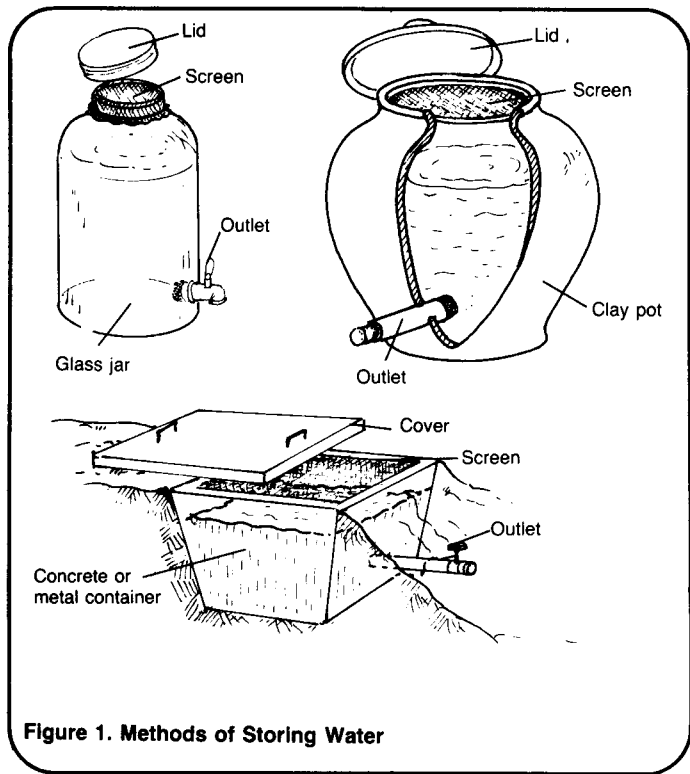
To produce good quality water through boiling and ensure that it does not become contaminated, follow these steps:

- Always store the boiled water in the same container in which it is boiled. Changing containers increases the risk of re-contamination. The only exception to this is if a household has a ceramic filter. In that case, pour the water into the filter for storage.

- Use containers that have covers or can be covered adequately. Dust, dirt and other debris can easily get into uncovered containers. Children and animals are more likely to come into contact with water left in uncovered containers.

- If possible, attach a spigot to the container so that there is no need to dip cups or other utensils into

the water. If a spigot cannot be attached, always pour the water from the storage container rather than dip utensils into it. Figure 1 shows a sample design for a tap that can help prevent re-contamination of stored water.



For filters that are designed for continuous flow, effective operation and maintenance should ensure that there is a continuous flow of water through the filter at all times. To ensure that this occurs, be sure to set up the intake so that there is always a small overflow from the filter. The small overflow indicates that the filter is full and the sand layer completely submerged.

For both continuous flow and non-continuous flow filters:

- Keep household sand filters covered so that it is completely dark inside the filter. Light may cause growths of green algae on the surface of the sand. Place the cover on the filter with a small space left so that some air may circulate. See Figure 2. Air circulation will help the growth of the biological layer on the sand in continuous flow filters.

- Clean the filter when water flow from it slows down greatly. To clean the sand, scrape off a layer approximately 5mm thick and throw it out. See

## Storage

To ensure good water quality, clean storage containers after they are emptied each time. Remove the sediment from the bottom and sides of the containers. At least once a month, wash the containers with a chlorine solution. Keep the storage containers covered at all times. Never dip buckets or cups into them.

## Household Sand Filter

Operation and maintenance requirements for a household sand filter depend on the type of filtration system constructed. Two designs are available: one that provides a continuous flow of water and keeps the sand layer submerged, and another which does not have a continuous flow of water and does not always keep the sand layer under water.

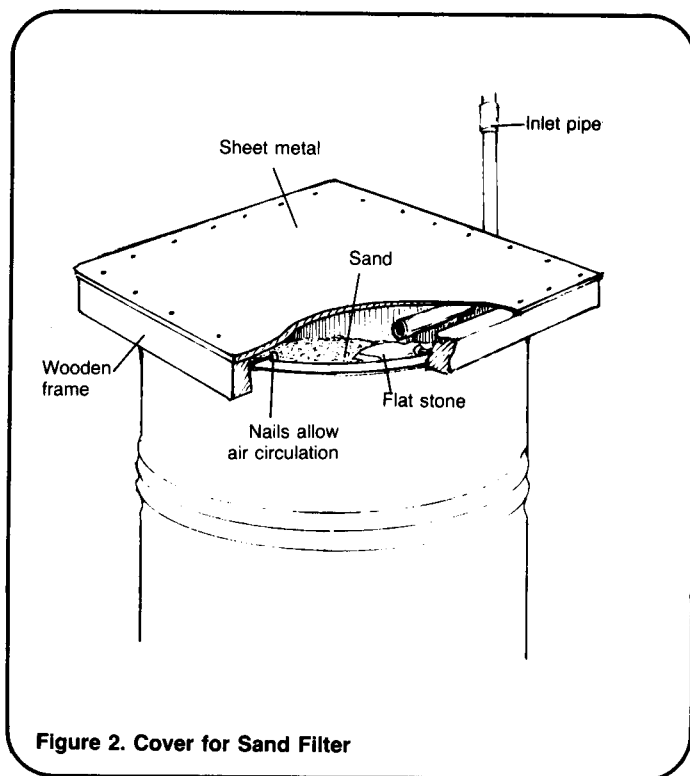


Figure 3. Then rake or scratch the surface lightly. Cleaning should only take place once every several weeks so as not to disturb the biological layer on the surface of the sand. After four or five cleanings, clean sand should be added to bring the layer of sand back to its normal height. Before adding new sand, scrape the old sand clean. Then add either new sand or sand from the filter that has been thoroughly washed.

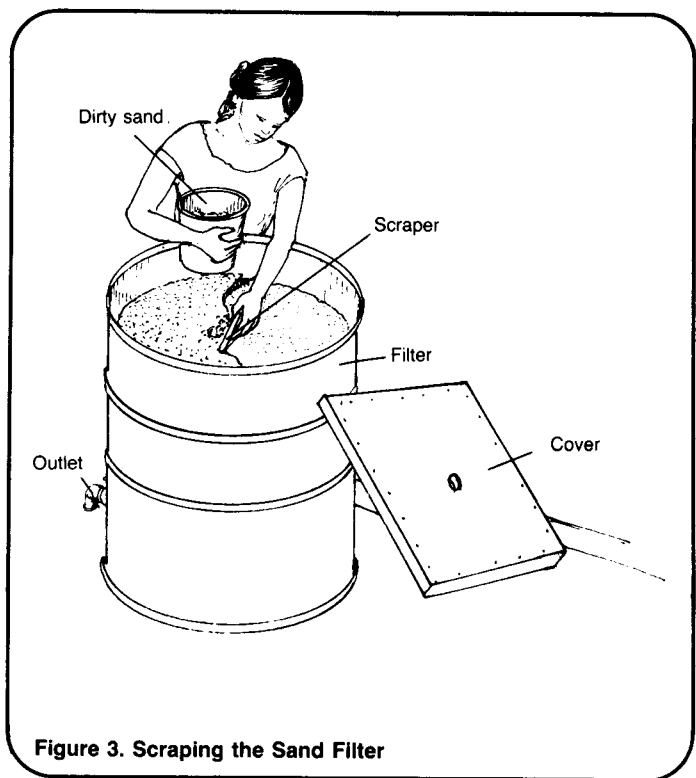


Figure 3. Scraping the Sand Filter