

Sanitizing Water-Using Appliances in Water Emergencies and Well Disinfection Procedures

Excerpted from the Water Quality Association Online Knowledge Base

The conventional and highly appropriate response of municipalities, health departments, and other regulatory agencies in times of water emergencies is to notify all consumers to boil all water used for drinking or culinary purposes until bacteriological samples demonstrate that the water is safe, and/or until appropriate corrective actions have been completed. Such notices are commonly called a "boil water advisory" (BWA).

The following list of typical criteria used by utilities and municipalities for issuing a BWA shows a variety of circumstances that can commonly trigger boil water advisories.

- Disruption of water treatment or water supply facilities, such as flooded wells or treatment plants, broken water mains, or power outage.
- Sudden increase in reported illnesses suspected to be caused by contaminated drinking water.
- Positive detection of disease-causing waterborne microorganisms.
- Positive coliform detection that is determined to persist (repetitive positive sample analysis results) in a public water system.
- High turbidity or sudden increase in turbidity signifying potential contamination from disease-causing microorganisms.
- Lack of chlorine residual.
- Water pressure falling below 20 pounds per square inch (psi) in any portion of the public supply's water distribution system.

Disasters, such as floods and earthquakes, will, of course, gravely compromise public water systems. Frequently in other cases, however, if there is the slightest possibility of microbiological contamination, such as a reduction in chlorine residual or in water pressure below 20 psi, authorities will usually issue a BWA just to be safe.

Determining the degree of health risk to the water consuming public from POU and POE equipment after a BWA requires a thorough knowledge of the equipment the dealer sells, services, and maintains. Since the dealer may receive inquiries concerning equipment other than that provided by the dealer, a knowledge of competing equipment is also helpful. Recommendations made in all cases should follow the manufacturer's instructions, if available.

If there are questions concerning the reason for issuing the BWA or the degree of disinfection of the equipment required, the dealer should consult with the municipality or water district that issued the BWA or the regulatory agency that has oversight for the water system. In some cases, the BWA may only apply to specific portions of the distribution system. Knowing the specific circumstances of the BWA will be helpful in determining actions to then be taken by the dealer.

Water treatment professionals, dealers, and most importantly, individual customers must be aware that many home water treatment equipment products (including reverse osmosis systems) do not provide total protection against all types of disease-causing microorganisms that may be present in contaminated drinking water. In many cases, products will be labeled with a statement such as: "Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system." However, there are water treatment devices that are certified for microbiological health claims under NSF/ASNI Standard 53, and some BWA situations may occur that can be adequately handled by home water treatment equipment.

For example, a temporary loss of chlorine residual or a drop in distribution system water pressure, but where no contamination can be confirmed by water analyses, will not likely interrupt the integrity of ordinary household water treatment units and, therefore, may not require special equipment sanitization precautions. Equipment that is certified for "cyst" reduction is capable of removing protozoa such as cryptosporidium and giardia and those certified to disinfect microbiologically contaminated water would be capable of treating perhaps other pathogens, such as bacteria and viruses in drinking water.

Before using the water from a home water treatment device or servicing the device during or after a boil water advisory, refer to the manufacturer's "performance data sheet," owner's manual, or other literature to determine whether the unit is certified as effective for treating bacteria, viruses, and cysts in water that is microbiologically unsafe. If it is not, then boil all drinking water during the boil water advisory. After the BWA has been discontinued, refer to the manufacturer's owner's manual for instructions on cleaning and sanitizing the water treatment device. If you do not have a manual or if no information is given for proper steps to take during or following a BWA, call the manufacturer for advice.

The manufacturer's specific instructions should always take precedence when servicing a water treatment device after a BWA. Each manufacturer's equipment is different, and appropriate cleaning and sanitizing procedures may also differ accordingly. Following evidence of serious potential disease-

causing contamination or in flood or other disaster-stricken areas and after the discontinuance of a BWA has been issued and the water supply has been declared safe to use and drink, several sanitization steps should be taken to ensure that water treatment equipment is ready to use again. Similarly, residents who get water from a private well must be concerned about contamination of their water supply and should follow basic procedures to clean and sanitize their well and water treatment equipment before use, whenever a water test indicates that well contamination has occurred.

Recommended Cleaning and Sanitizing Guidelines for Water Using Appliances Following Discontinuance of a Boil Water Advisory *

* Courtesy of EcoWater Systems, Inc., St. Paul, Minnesota

Before Beginning the Sanitizing Process

With lower risk BWA situations where no actual microorganism contamination or waterborne illnesses have occurred, routine equipment sanitation will suffice following a BWA. In judging the significance or degree of actual water safety impairment that may have occurred during a BWA, the water assessment may be discussed with state or local health/environmental protection agency officials. Where health-related contamination or illnesses have been confirmed, the first step toward equipment sanitization is to determine that the BWA has been lifted and that the water supply is again safe to use and drink. This information is available by contacting your municipal water supplier or the applicable regulatory agency.

Homeowners with their own private well system need to "shock chlorinate" their well. Shock treating a well involves using a household bleach solution to flush out the entire system. Water should be checked after each treatment by a qualified laboratory to ensure that it is safe to drink. Specific instructions for shocking wells are described in the section well disinfection or may be obtained from your local department of health or a pump installer. Note that some locations only allow licensed well drillers and pump installers to be contracted for well disinfection.

Basic Preparation

- If an appliance has been partially or fully submerged in water, make sure electrical components are completely dry.

- Drain all water from water using appliances such as water heaters and cartridge filters (be sure that the power or gas to the water heater is turned off). Refer to the article sections below for basic preparations for water softeners, backwashing filters, and reverse osmosis (RO) units. For ice makers, discard all ice and beverages made with the questionable water; remove any water treatment device and flush the service line with disinfected water for two minutes, place the new water treatment unit in line and run two ice making cycles, discarding all the ice both times. Finish by cleaning the ice reservoir.
- Remove all debris, mud, silt, etc. from inside and outside of the appliance, and clean exterior and interior surfaces with a disinfecting cleaner. Be certain the cleaner to be used is recommended by the equipment manufacturer as being compatible with this product.
- You are now ready to begin the sanitizing procedure. Please follow the steps outlined below and as previously described in this text for each water-using appliance.
- Handle all disinfectants with care; refer to the label on the bleach bottle for safe handling (see also WQA Knowledge Base: Disinfectant Sanitizers) and use USEPA registered disinfectant chemicals approved for drinking water and/or certified to NSF/ANSI Standard 60.