WATER TREATMENT DEVICES

Information on Drinking Water Treatment Devices for Disinfection & Chemical, Taste & Odor Removal:

Background

Clean potable water is a resource most Canadians take for granted. Many consumers are supplied with municipally treated water. However, in rural areas most people rely on private wells or surface sources for their drinking water.

Public awareness of the potential pollution of our water sources and the increased public use of areas not served with safe drinking water supplies has led to an increase in the use of water treatment devices.

It is important to test your drinking water regularly; especially if it hasn't been checked for a while or it there has been any changes to its appearance, taste or smell. Before inventing in a treatment device consult a reputable professional and/or your local Public Health Inspector.

Types of Devices

There are two main types of drinking water treatment devices available:

- Disinfecting devices used to destroy or remove harmful microorganisms
- Devices for chemical, taste and odor removal or their control

Disinfecting Devices

There are a variety of disinfecting devices available. The choice on which device to use must be considered carefully. The effectiveness of each may depend on the quality of water being treated: very contaminated; cloudy water; or water with high iron or colour may not be completely treated by disinfection alone and may require further treatment.

Chlorinator

- Adds a chlorine solution through an injector mechanism to kill microorganisms
- Requires at least 15 minutes contact time to be effective
- Provides residual disinfection that may prevent re-contamination
- Residual can be easily tested to confirm chlorinator operation

Iodinator

- Work the same as chlorinators
- Should not be used continuously over long periods because of possible physiological effects

Ultraviolet Light (UV)

- Destroys microorganisms by exposing them to ultra violet radiation
- Easy to install
- UV lamp should be checked and cleaned periodically; or replaced where necessary
- No residual disinfection
- Very cloudy, turbid, highly contaminated, or high iron water may not be effectively treated without suitable pretreatment

Ozonator

- Uses ozone to destroy microorganisms
- Sealed until requiring moderate amounts of electricity to produce ozone
- Excess ozone must not leak out of unit into environment
- Some residual protection
- Easy to install and maintain
- May be expensive

Other Devices

- Include ceramic filters, chlorine or iodine tables, special cups or straws along with other filters supplemented with a chemical disinfectant
- Effective when used according to directions

Devices for Removal of Chemicals, Taste and Odor

- The appearance, taste and smell of drinking water is usually more obvious to the consumer than the bacterial quality
- Chemicals such as iron, manganese, calcium hardness and sulphide, (to name a few) can impart disagreeable taste and odorous
- Chemicals can cause some economic concerns as well: e.g. very hard water will use more soap or laundry detergent
- To solve these problems, there are a number of different devices. These unites do not disinfect and can in fact accumulate any existing bacterial contamination

Activated Carbon or Charcoal Filters

- Remove chlorine, odor and taste (or organic origin)
- Cartridge filters must be changed often, if water is dirty or has sediment plugging the filter
- Inexpensive and easy to install
- Require no power to operate
- Should only be used on disinfected or bacterially safe water
- Bacterial counts may ultimately increase in the water passing through the filters that have trapped dirt and organic matter. For removal of Cryptosporidium and Giardia cysts, only filters that remove particles one micrometer or less in diameter should be considered

Reverse Osmosis

- Water is forced through a filtering membrane to remove most chemicals and organisms
- Easy to install and maintain
- Pretreatment or the water may be needed membrane filters may clog or rupture requiring more frequent replacement, especially if water is or poor quality
- Effective for removing metals, minerals salts, tastes and microorganisms

Water Softener

- Ion exchange of calcium (chat causes hard water), for sodium
- Softened water is not recommended for drinking because increased sodium content can be of real health concern if exceeding the upper limit of 200 PPM
- May use and discharge significant amounts of salt

- Sodium-free softeners are available
- Backwash from softener should not discharge into private sewage system (septic tanks), as a general rule. There may be exceptions, depending on individual property conditions and circumstances

Special Filters

- Filters designed to remove specific problems: iron and sulfur filters; sediment filters; taste & odor filters (organic problems)
- Automated devices should be installed by a knowledgeable and competent person with experience on water treatment
- Effective and can help other treatment devices work better
- Require some maintenance, i.e. chemicals, adjustments, mechanical repairs
- Some point-of-use sediment filters are available for single taps

References

Ministry of Environment and Energy
Health Canada
Ministry of Health
Canadian Consumer
Canadian Institute of Public Health Inspectors

For more information contact:

The Grey Bruce Health Unit at 519-376-9420 or 1-800-263-3456