Fact Sheet 7, Drinking Water Quality Assurance Rules 2022

Water Treatment

A drinking water supply must be treated according to its type and size as per the Drinking Water Quality Assurance Rules 2022 (Revised 2024).

The most common methods are presented below:

Pre-treatment

Used to reduce, and/or stabilise variations in the microbial, natural organic matter and particulate load. It can also be used to control algae in the raw water.

Pre-treatment processes must be regularly inspected, maintained and monitored.

Filtration

Can remove particles (e.g., sediment), chemicals, algal toxins and microorganisms.

Filters must be regularly maintained and replaced to be effective.

For water supplies with a lot of suspended particles it may also be necessary to use a coagulation treatment process before filtering the water.

Cartridge filters - remove particles of a range of sizes, from suspended dirt through to microorganisms.

Rapid media filters - remove suspended particles, but generally not chemicals and algal toxins.

Slow sand (biological) filters - rely on a biologically active layer on top of the sand to remove and degrade particles.

Ceramic filters – remove bacteria and parasites from water, but only certain types with an extremely small pore size will remove viruses. Ceramic filters are not used for removing chemicals.

Membrane filters - remove particles, bacteria, viruses, and dissolved substances depending on the pore size of the semi-permeable membrane.

Activated carbon filters - help control taste and odour problems and remove algal toxins. They are not usually used for removing bacteria, parasites or viruses (although some may be effective for this).

Resin-based ion exchange filters - help to soften the water by removing hardness or other dissolved salts. They do not remove microorganisms.

Reverse osmosis filtration - remove most contaminants including minerals, microorganisms, and sediments.

Disinfection

This is the single process that has had the greatest impact on drinking water safety. Disinfection is generally the last step of water treatment and will kill most bacterial pathogens and greatly reduce the numbers of viral and most protozoan pathogens. Disinfection will not remove chemical contamination.

Chlorine Disinfection controls many microorganisms but is not very effective in controlling parasites such as Giardia and Cryptosporidium. It is best used as an automated system to maintain a suitable level of chlorine at the point of injection.

Different ways to chlorinate drinking water:

- Adding sodium hypochlorite liquid using a small dosing pump, or by electrolysing a salt solution.
- Adding calcium hypochlorite powder or tablets dissolved into liquid which is then added to the water using a small dosing pump.
- Chlorine can be added as a liquified gas.

Regular operational inspections and maintenance are important to check on levels of chlorine product, accept delivery of chlorine, refill the disinfection system, check and maintain the condition of tanks, dosing lines and pumps. In addition, any sensors used in the chlorination system (dose controller's and pH probe) will need to be calibrated or replaced.

Ultraviolet light disinfection is common and effective to kill many kinds of microorganisms, including the parasites Giardia and Cryptosporidium. Filtration to remove suspended particles often needs to occur before the water reaches the UV disinfection unit. UV requires a reliable power supply, and the UV lamp should be changed regularly. For best results, you should use UV disinfection either at the point of use, or in combination with chlorination.