North Texas Municipal Water District

NTMWD Protective barriers provide Safe Drinking Water

The North Texas Municipal Water District (NTMWD) water treatment process uses four protective barriers to remove particulates, impurities and water-borne microorganisms to effectively treat raw water taken from Lake Lavon.

A protective barrier is a point in the treatment process serving as a boundary for the removal or control of these impurities. Barriers can be physical or chemical depending upon the process.

Water-borne microorganisms controlled include Giardia and those causing dysentery, cholera, and typhoid. The raw water supply from Lake Lavon before treatment has a very high quality.

Coagulation, flocculation, and sedimentation form the first barrier in the treatment process serving to clean suspended particles from the water. This is a physical barrier in that the impurities are physically removed from the water. To attract the suspended particles and colloids, a strong coagulant (ferric sulfate) is added. The combination of the colloid and the coagulant forms larger, much heavier particles known as floc.

These larger, heavier particles drop out of suspension by sedimentation. Most of the bacteria or other organisms also settle out of the water in the sedimentation basins. The settled solids are removed and the cleaner water flows to the filters.

Prior to reaching the filters, the cleaner water is disinfected, which is the second barrier of protection. Chlorine is used in the treatment process as a strong disinfectant and is added to kill algae, fungi, bacteria, and other microorganisms. This barrier is a chemical barrier. Chlorine is most effective when sufficient contact time is provided with the water. The longer the contact time and higher the chlorine concentration, the more effective the inactivation of the organisms. Sufficient contact time will vary for each different organism.

The chlorine added at this point is the primary disinfection. Disinfection is achieved by maintaining a chlorine residual in the filters for the time the water is detained there. Adequate contact time is provided through the filters to inactivate Giardia cysts, bacteria and viruses.

Filtration, the third barrier in the treatment process, occurs in dual media filters, using sand and anthracite coal as the media. As water flows through the filters, any remaining suspended particles are removed. The particles are entrapped between the grains of anthracite coal and sand, resulting in clean, clear treated water entering the distribution system.

After passing through the filters, an additional chemical, caustic soda, is added to restore the pH to a level required by the Lead and Copper Rule. The caustic soda stabilizes the water and prevents corrosion of distribution and customer pipes.

The fourth and final barrier against water-borne microorganisms is distribution disinfection. Before entering the high service pump to be distributed to member and customer cities, ammonia is added which combines with the chlorine in the water to form chloramines. Chloramines last longer and continue to disinfect the water supply throughout the distribution lines. Maintaining a small level of chloramines in the treated water means that even the plumbing in a home does not contribute disease causing organisms.

To ensure that disinfection has continued throughout the distribution lines and after the treated water has been delivered within the member and customer cities, NTMWD routinely tests water samples for water quality, chlorine residual, and any presence of coliform bacteria.

Water treatment diagram located on back