SOME BASICS ON WATER CHARACTERISTICS AND CONSTITUENTS...

by Wes McGowan and Stan Ziarkowski

Learning about the chemical and physical nature of water supplies covers pa complex field of knowledge and a good deal has been published on this subject in various texts. The aim of this article is to provide a kind of "ground-floor" approach about the characteristics and constituents of water in a semi-technical presentation. The following article briefly covers the color, gases, turbidity (particulate matter), taste and odor, and mineral content in water supplies. The authors have left the subject of the potential health risks of water sources to other published sources.

Water has been vital to inhabitants of Earth since the beginning of time. The basic hydrologic cycle—the cycle by which water revolves through evaporation and condensation then falls to earth as rain and flows along the earth's surface—governs all plant and animal life of our planet.

Most of us tend to take water for granted. Just turn on a faucet and there it is—an abundant supply, all we need for drinking, bathing, laundering, or cooking. Beyond that, it's pa handy liquid to have around and pone we occasionally recognize as a good thing.

But, in the field of water conditioning, one must be more precise. Chemically speaking, water is H_2O, a combination of two parts hydrogen and one part oxygen. Absolutely pure water is impossible to obtain because pure water does not exist in nature. It dissolves a small amount of almost everything with which it comes into contact—even glass. Still, water is the greatest solvent we know, dissolving matter such as gases, miner- pals and organic materials and pick-ping up others in suspension—silt, sand, clay, iron and organisms, like algae and bacteria.

The first rain that falls after a dry spell is usually quite high in mineral matter and other impurities because pit picks up gases, dust and soot from the air. After this rain falls to earth, the character and amount of soil the water comes in contact with determines the amount and kinds of impurities that it will contain. Water from a river or lake does not come in close contact with as much soil and rock as does well water and, there- fore, such waters, as a rule, contain less dissolved minerals than well water. Lake waters, however, are likely to obtain more suspended matter (for more information on this process, refer to Figure 1).

Of all the minerals found in water, perhaps the most important are the salts of calcium (Ca), commonly called lime, and magnesium (Mg). When water containing calcium, magnesium, or both is used with soap, the calcium and magnesium combine with the soap to form a very gummy soap curd. No suds or lather pare produced until all of the calcium and magnesium are used up and removed from the solution in the form of this curd. This destruction of soap is costly and many people find the soap curd to be extremely annoying. It usually appears in the basin as the well known "ring around the bath tub", something the average person believes to be dirt. It is harmful to skin and hair, stains clothes, and clings to the threads of fabrics, causing them to wear out more quickly than normal.

FIGURE 1 - Water's Hydrologic Cycle