

Water Terms Dictionary

Activated Carbon Filtration

can remove organic chemicals that produce off-taste and odor. These compounds are not dangerous to health but can make the water unpleasant to drink. Carbon filtration comes in several forms, from small filters that attach to sink faucets to large tanks that contain removable cartridges. Activated carbon filters require regular maintenance or they can become a health hazard.

Algae

are microscopic plants that are free-living and usually live in water. They occur as single cells floating in water, or as multicellular plants like seaweed or strands of algae that attached to rocks.

Alpha and beta radioactivity

represent two common forms of radioactive decay. Radioactive elements have atomic nuclei so heavy that the nucleus will break apart, or disintegrate spontaneously. When decay occurs, high-energy particles are released. These high-energy particles are called radioactivity. Although radioactivity from refined radioactive elements can be dangerous, it is rare to find dangerous levels of radioactivity in natural waters.

An alpha particle is a doubly-charged helium nucleus comprised of two protons, two neutrons, and not electrons. A beta particle is a high-speed electron. Alpha particles do not penetrate matter easily, and are stopped by a piece of paper. **Beta particles** are much more penetrating and can pass through a millimeter of lead.

As nitrogen

is an expression that tells how the concentration of a chemical is expressed mathematically. The chemical formula for the nitrate ion is NO_3 , with a mass of 62. The concentration of nitrate can be expressed either in terms of the nitrate ion or on terms of the principal element, nitrogen. The mass of the nitrogen atom is 14. The ratio of the nitrate ion mass to the nitrogen atom mass is 4.43. Thus, a concentration of 10 mg/L nitrate expressed as nitrogen would be equivalent to a concentration of 44.3 mg/L nitrate expressed as nitrate ion. When dealing with nitrate numbers it is very important to know how numeric values are expressed. A concentration of 22 mg/L nitrate expressed as nitrate ion sounds very high compared to a standard of 10mg/L, but the standard is expressed as nitrogen. Converting 22 mg/L nitrate expressed as nitrate is only 4.9 mg/L nitrate expressed as nitrogen, less than half the drinking water standard. Older nitrate data (pre-1980) were commonly reported as nitrate, and that makes comparisons with the drinking water standard difficult. For purposes of drinking water regulations, standards are expressed in the form of the principal element.

Bacteria

are small one-celled animals, too small to be seen by the naked eye. Bacteria are found anywhere, including on and in the human body. Humans would be unable to live without the bacteria that inhabit the intestines and assist in digesting food. Only a small percentage of

bacteria cause disease in normal, healthy humans. Other bacteria can cause infections if they get into a cut or wound. Bacteria are the principal concern in evaluating the microbiological quality of drinking water, because some of the bacteria-caused diseases that can be transmitted by drinking water are potentially life-threatening.

Chlorine

is a chemical used to disinfect water. Chlorine is extremely reactive, and when it comes in contact with microorganisms in water it kills them. Chlorine is added to swimming pools to keep the water safe for swimming. Chlorine is available as solid tablets for swimming pools. Chlorine is very effective against algae, bacteria, and viruses. Protozoa are resistant to chlorine because they have thick coats. Protozoa are removed from drinking water by filtration.

Coliform bacteria

are bacteria normally found in the intestines of warm-blooded animals and in the soil. Coliform bacteria are used as an indicator species for the presence of possible drinking water contamination.

Disinfection

is the application of a chemical to kill most, but not all, microorganisms, that may be present. Chlorine is added to Monterey Park's drinking water for disinfection. Disinfection makes drinking water safe to consume from the standpoint of killing pathogenic microorganisms including bacteria and viruses. Disinfection does not remove all bacteria from drinking water, but the bacteria that can survive disinfection with chlorine are not pathogenic bacteria that can cause disease in normal healthy humans.

Filtration

is the process of passing water through materials with very small holes to strain out particles. Water treatment plants use filters usually composed of gravel, sand, and anthracite carbon. These materials settle into a compact mass that forms very small holes. Particles are filtered out as treated water passes through these holes. These holes are small enough to remove microorganisms including algae, bacteria, and protozoans, but not viruses. Viruses are eliminated from drinking water through the process of disinfection using chlorine.

Hardness

is a measure of the amount of calcium and magnesium salts in water. More calcium and magnesium lead to greater hardness. The term "hardness" comes from the fact that it is hard to get suds from soap or detergents in hard water. This happens because calcium and magnesium react strongly with negatively charged chemicals like soap to form insoluble compounds.

Heterotrophic Plate Count

is a test performed on drinking water to determine the total number of all types of bacteria in the water.

Inorganic Ions

are present in all waters. Inorganic ions are essential for human health in small quantities, but in

larger quantities they can cause unpleasant taste and odor or even illness. The City of Monterey Park Water System routinely tests the mineral content of the water.

mg/L

stands for "milligrams per liter." This is a common unit of chemical concentration. It expresses the mass of a chemical that is present in a given volume of water. A milligram is one one-thousandth of a gram. A liter is equivalent to about one quart. Another term used as equivalent to mg/L is "parts per million."

µg/L

stands for "micrograms per liter." This is a common unit chemical concentration. It expresses the mass of a chemical that is present in a given volume of water. A milligram is one one-millionth of a gram. A liter is equivalent to about one quart. Another term used as an equivalent to ug/L is "parts per billion."

Microorganisms

are very small animals and plants that are too small to be seen by the naked eye and must be observed using a microscope. Microorganisms in water include algae, bacteria, viruses, and protozoa. Algae growing in surface waters can cause off-taste and odor by producing the chemicals MIB and geosmin. Certain types of bacteria, viruses, and protozoa can cause disease in humans. Bacteria are the most common microorganisms found in treated drinking water. The great majority of bacteria are not harmful. In fact humans would not be able to live without the bacteria that inhabit the intestines. However, certain types of bacteria called coliform bacteria can signal the presence of possible drinking water contamination.

Milliliter

A milliliter is one-thousandth of a liter. A liter is a little more than a quart. A milliliter is about two drops from an eyedropper.

Pathogenic microorganisms

are organisms capable of producing disease.

Picocurie

A picocurie is a unit of radioactivity. "Pico" is a metric prefix that means one one-millionth of one one-millionth. A picocurie is one one-millionth of one one-millionth of a Curie. A Curie is that quantity of any radioactive substance that undergoes 37 billion nuclear disintegrations per second. Thus a picocurie is that quantity of any radioactive substance that undergoes 0.037 nuclear disintegrations per second.

Protozoa

are microscopic animals that occur as single cells. Some protozoa can cause disease in humans. Protozoa form cysts, which are specialized cells like eggs that are very resistant to chlorine. Cysts can survive the disinfection process, then "hatch" into normal cells that can cause disease. Protozoa must be removed from drinking water by filtration, because they cannot be effectively killed by chlorine.

Radiochemicals

or radioactive chemicals, occur in natural waters. Naturally radioactive ores are particularly common in the Southwestern United States, and some streams and wells can have dangerously high levels of radioactivity. Total alpha and beta radioactivity and isotopes of radium and strontium are the major tests performed for radiochemicals. The federal drinking water standard for gross alpha radioactivity is set at 5 picocuries per liter.

Reverse Osmosis

forces water through membranes that contain holes so small that even salts cannot pass through. Reverse osmosis removes microorganisms, organic chemicals, and inorganic chemicals, producing very pure water. Reverse osmosis units require regular maintenance or they can become a health hazard.

Viruses

are very small disease-causing microorganisms that are too small to be seen even with microscopes. Viruses cannot multiply or produce disease outside of a living cell.

Volatile Organic Compounds

(VOCs) are solvents used as degreasers or cleaning agents. Improper disposal of VOCs can lead to contamination of natural waters. VOCs tend to evaporate very easily. This characteristic gives VOCs very distinct chemical odors like gasoline, kerosene, lighter fluid, or dry cleaning fluid. Some VOCs are suspected cancer-causing agents.