Environmental
Analytical Laboratories

Chemical Health and Toxicity Package

BORON (B)
Boron is widespread in the environment. Levels in well water are more variable and often higher than those in surface waters, most likely owing to erosion from natural sources. The maximum acceptable concentration of **5.0 mg/L** has been set on the basis of health considerations.

SELENIUM (Se)
Food is the main source of intake of selenium; therefore toxic effects have most often been associated with food intake. The maximum acceptable concentration of **0.01 mg/L** for selenium in drinking water has been established on the basis of health considerations. Drinking water containing selenium at the maximum acceptable concentration would be the source of only 10 percent of total selenium intake.

ALUMINUM (Al)
At this point in time there has been no maximum acceptable concentration set for aluminum in drinking water. In large quantities, it causes damage to the nervous system, kidneys and heart.

ARSENIC (As)
Natural sources, such as the dissolution of arsenic-containing bedrock, often contribute significantly to the arsenic content of drinking water and groundwater. A number of disorders have been associated with the intake of arsenic in drinking water; however, there is no evidence of any specific illness associated with the ingestion of water containing arsenic at the maximum acceptable concentration of **25 ug/L** (0.025mg/L). (Saskatchewan Guideline). Note that the Canadian guideline is 10 ug/L (0.01 mg/L).

BARIUM (Ba)
Barium is present as a trace element in both igneous and sedimentary rocks. Despite a relative abundance in nature, barium occurs only in trace amounts in water. Ingestion of barium may result in serious toxic effects to the heart, blood vessels, and nerves. For this reason the maximum acceptable concentration of barium in drinking water has been set at **1.0 mg/L.**

CADMIUM (Cd)
Food is the main source of cadmium intake for humans that are not occupationally exposed. Because it is difficult to reduce cadmium intake from food, the intake from water should be as low as possible. Therefore, the maximum acceptable concentration of cadmium in drinking water is **0.005 mg/L**.

CHROMIUM (Cr)
Trivalent chromium, the most common naturally occurring state of chromium, is not considered to be toxic; however, if present in raw water it may be oxidized to hexavalent chromium during chlorination. Toxic effects of chromium in humans are attributed primarily to this hexavalent form. The maximum acceptable concentration is **0.05mg/L**

COPPER (Cu)
Copper and its compounds are widely distributed in nature, and copper is found frequently in surface water and in some groundwater. Copper is an essential and beneficial element in human metabolism and is generally considered to be non-toxic except at high doses. Copper contributes to corrosion of aluminum and zinc and also imparts an undesirable bitter taste to water. Staining of laundry and plumbing fixtures occurs at copper concentrations above 1.0 mg/L. Therefore, the aesthetic objective for copper in drinking water is set at a maximum of **1.0 mg/L.**

IRON (Fe)
At levels above 0.3 mg/L, iron stains laundry and plumbing fixtures and causes undesirable taste. The precipitation of excess iron causes a reddish brown color in the water. It may also promote the growth of iron bacteria, leaving a slimy coating in piping. The presence of iron bacteria can also cause a 'rotten egg' odor in the water and a sheen on the surface of the water. The aesthetic objective is set at a maximum of **0.3 mg/L.**

MANGANESE (Mn)
Manganese can cause staining to plumbing and laundry and undesirable tastes in beverages. Also, it may lead to the accumulation of bacterial growth in the piping. The aesthetic objective is set at a maximum of **0.05 mg/L.**

LEAD (Pb)
Natural waters seldom contain more than 0.005 mg/L lead. Lead may be present in tap water as a result of dissolution from natural sources or from household plumbing systems containing lead in pipes, solder or service connections to homes. Lead has long been recognized as a general metabolic poison which causes a variety of human disorders. Children are more susceptible to the effects of lead poisoning. The maximum acceptable concentration of lead in drinking water is **0.01 mg/L.**

ZINC (Zn)
Zinc is an essential element and is considered to be non-toxic. Water containing zinc levels above 5.0 mg/L tends to be opalescent, develop a greasy film when boiled, and have an undesirable astringent taste. Therefore, the aesthetic objective is set at a maximum of **5.0 mg/L**.

URANIUM (U)
Uranium may enter drinking water from naturally occurring deposits. Phosphate fertilizers may contain uranium at an average concentration of 150 ppm and can also contribute uranium to groundwater. Ingestion of large quantities may result in damage to the kidneys. The maximum acceptable concentration is set at **20 ug/L** (0.02mg.L).

Communities with populations greater than 5000 may be required to test for Mercury and Cyanide:

MERCURY (Hg)
Mercury is a toxic element and serves no beneficial physiological function in man. The maximum acceptable concentration is set at **1 ug/L** (0.001mg/L). Mercury levels in both surface water and groundwater are generally well below this level.

CYANIDE (CN)
Cyanides are used in many industrial processes, and industrial effluents are the major sources of cyanide contamination of water. Because cyanide is toxic to man, a maximum acceptable concentration of **200 ug/L** (0.2mg/L) has been set.

CONTACT

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