Bethel Public Utilities Commission

February 12, 2016

Trihalomethanes Questions and Answers

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what THMs are and what we are doing to correct this situation.

Q: What are THMs?

A: THMs are disinfection by-products that form when chlorine is added to water that contains elevated levels of natural organic matter such as decaying leaves and vegetation. High THM levels are common for surface-based public water supplies in United States because many of them contain high levels of natural organic matter. Formation of disinfection by-products continue to be an issue in the United States and are being addressed through chlorine demand management and exploring various corrective measures. Disinfection is an essential component of public drinking water treatment. The health risks from disinfection by-products, including THMs, are much less than the risks from consuming water that has not been appropriately disinfected.

Q: What are chlorination disinfection by-products and how are they formed?

A: Chlorination disinfection by-products (CDBPs) are chemical compounds that form when water containing natural organic matter (the decay products of living things such as leaves, human and animal wastes, etc.) is chlorinated. Chlorine disinfection of water can lead to the formation of a number of chlorination by-products of which trihalomethanes (THMs) are only one subgroup. Among the many chlorination by-products, THMs are most often present and in

the greatest concentration in drinking water and as such are used as indicators of total disinfection by-product formation.

Q: Why is drinking water chlorinated?

A: Chlorination is necessary for two reasons. First, almost all sources of surface water contain microbiological organisms, which have to be removed in order to prevent the outbreak of waterborne diseases such as typhoid fever and cholera. Second, once the treated water leaves the treatment plant, it may travel through water mains and pipes sometimes at significant distances, before it reaches its destination. During this time, it is necessary to maintain a residual level of disinfectant in the water to ensure no possible regrowth of microorganisms. Microbial contaminants are referred to as acute contaminants which impact human health directly with illnesses such as gastrointestinal disease. THMs are referred to as chronic contaminants which impact human health from sustained exposure over many years. Without adequate disinfection, the health risks from microorganisms far outweigh the risks from THMs.

Q: What is the current United States drinking water guideline for THMs?

The current United States drinking water quality guideline for THMs is 80 parts per billion (ppb). The guideline is based on an site specific quarterly samples. THMs levels are generally highest in the summer and lowest in the winter.

Q: What are the health effects associated with THMs?

A: The health effects for total trihalomethanes, as described on the USEPA web site, state that "Some people who drink water containing total trihalomethanes in excess of the MCL over many years could experience liver, kidney, or central nervous system problems and increased risk of cancer." The risk of illness from THMs is much lower than the risk of illness from drinking water that has not been disinfected. Regardless, the Town is committed to addressing the violation of the THM limit.

To find more information go to: **http://www.epa.gov**

Q: Which public water supplies have the highest/lowest levels of THMs?

A: Levels of THMs are generally highest in treated water from sources with high organic matter content, such as rivers and lakes. Lower levels of THMs are usually found when the source water is groundwater. Two common strategies to control THMs in drinking water is to use alternative disinfectants which are less reactive or to remove organic matter from water supplies.

Q: What are the alternate disinfectants?

A: Alternate disinfectants include chloramine, chlorine dioxide and ozone. Each of these alternate disinfectants have their own advantages and disadvantages regarding handling and storage, disinfection by-product formation and cost. The use of chlorine is, however, essential to maintain the required residual in the water distribution system in order to ensure microbiologically safe water.

Q: What is being done to reduce the levels of THMs in Bethel Water Supply?

A: At present we are working to minimize the formation of THM's while ensuring we maintain an adequate level of disinfectant and water supplies to our customers. On bi-annual basis we are conducting our normal system flushing and will continue with our water quality system flushing plan, and continue to work with on a long term corrective action which will ensure continued compliance with the THM standard water. This plan includes looping our water distribution system to eliminate dead ends and stagnant water, installing new water mains, increase water flushing frequency during summer months, phasing out our surface water supplies and switching over to new groundwater sources and installing mixing systems in our storage tanks to promote improved water quality.

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