

Chemical and microbial characteristics of municipal drinking water supply systems in the Canadian Arctic - DTU Orbit (09/11/2017)

Chemical and microbial characteristics of municipal drinking water supply systems in the Canadian Arctic

Drinking water in the vast Arctic Canadian territory of Nunavut is sourced from surface water lakes or rivers and transferred to man-made or natural reservoirs. The raw water is at a minimum treated by chlorination and distributed to customers either by trucks delivering to a water storage tank inside buildings or through a piped distribution system. The objective of this study was to characterize the chemical and microbial drinking water quality from source to tap in three hamlets (Coral Harbour, Pond Inlet and Pangnirtung-each has a population of 0.2 mg/L free chlorine). Some buildings in the four communities contained manganese (Mn), copper (Cu), iron (Fe) and/or lead (Pb) concentrations above Health Canada guideline values for the aesthetic (Mn, Cu and Fe) and health (Pb) objectives. Corrosion of components of the drinking water distribution system (household storage tanks, premise plumbing) could be contributing to Pb, Cu and Fe levels, as the source water in three of the four communities had low alkalinity. The results point to the need for robust disinfection, which may include secondary disinfection or point-of-use disinfection, to prevent microbial risks in drinking water tanks in buildings and ultimately at the tap.

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