Lake Elsinore & San Jacinto Watersheds Authority

City of Lake Elsinore • City of Canyon Lake • County of Riverside
Elsinore Valley Municipal Water District • Santa Ana Watershed Project Authority

Summary of Key Human Health Considerations Related to Aluminum Exposure

1) U.S. EPA has not established a Primary Maximum Contaminant Level (MCL) to regulate aluminum concentrations in drinking water. EPA has recommended a Secondary MCL to prevent excess aluminum in drinking water from causing taste, odor or staining problems.[1] The Secondary MCL for aluminum is 0.05 to 0.2 mg/L.

2) California's Office of Environmental Health Hazard Assessment (OEHHA) has established a Public Health Goal (PHG) of 0.6 mg/L of aluminum in finished tap water.[2] And, the PHG includes a 100x (10,000%) safety factor.[3]

3) The World Health Organization (WHO) recommended a water quality guideline of 0.9 mg/L of aluminum to protect human health. The WHO also found that, even among water utilities that use alum as part of the treatment and purification process, the residual aluminum concentration in finished tap water is routinely less than 0.1 mg/L.[4]

4) Aluminum concentrations in Canyon Lake, immediately following alum application, will be approximately 1.0 mg/L. However, the alum rapidly binds with phosphorus, becomes inert, and settles into the sediment. Aluminum concentrations in the lake itself will meet the PHG for aluminum for finished tap water within 24 hours following the alum application.

5) The aluminum phosphate particles that form immediately after alum application are not dissolvable in water.[3] Therefore, any stray particles that did not settle into the sediment will be easily removed by EVMWD's current filtration system before the water from Canyon Lake is served to the community.

6) Alum is a common ingredient in cosmetics, antiperspirants, toothpaste, bath salts and antacids. It is sold as a spice in most grocery stores. The U.S. Center for Disease control estimates that the average person already consumes approximately 10-20 mg/day of aluminum.[5] Less than 10% of the average person's daily intake comes from drinking water. If someone were to drink one quart of lake water immediately following the alum application, they would consume one extra milligram of aluminum that day. That is less than the amount of extra aluminum they would ingest by taking just one antacid tablet or one buffered aspirin. Were that same person to drink another quart of lake water the day following the alum application, there would be no measureable increase in their total aluminum consumption compared to their normal daily average intake of aluminum.

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[1] See http://water.epa.gov/drink/contaminants/index.cfm
[2] See http://oehha.ca.gov/water/phg/allphgs.html
[3] See http://oehha.ca.gov/water/phg/pdf/Aluminumf.pdf OEHHA. Public Health Goal for Aluminum in Drinking Water. April, 2001
[4] See http://www.who.int/water_sanitation_health/dwq/chemicals/aluminium/en/ WHO/HSE/WSH/10.01/13 (2010).
[5] See http://www.atsdr.cdc.gov/toxprofiles/tp22-c2.pdf