

ARSENIC

Level 1 Carcinogen and Fluorosilicate contaminant

Table 4: NRC 2001 Report on Arsenic and the US EPA risk assessments

Arsenic concentration ppb	Variable risk for one individual	People per 100,000 at risk of cancer	Comments
3.00ppb	1/500	200	
1.50ppb	1/1000	100	NSF reports 1.66 ppb sample to House investigation in 2000
1.00ppb	1/1500	66	NSF Single Product Allowable Concentration (SPAC)
0.60ppb	1/2500	40	NSF recently reported allowable sample
0.50ppb	1/3000	33	
0.40ppb	1/3750	26	NSF reports 0.43 ppb average of detectable samples to House investigation in 2000
0.30ppb	1/5000	20	NSF recent reports 0.29 ppb mean of detectable samples
0.20ppb	1/7500	13	
0.10ppb	1/15000	6	NSF reports 0.12 ppb average, w/57% “not detected”
0.05ppb	1/30000	3	

NRC 2001 Report on Arsenic²⁰ risk assessments show the associations to lung/bladder cancer for the exposures from arsenic concentrations after dilution from hydrofluosilicic acid products. This report calculated that 20 out of 10,000 people would get lung cancer, bladder cancer or other cancers at 3ppb arsenic in drinking water. Written another way, 1 out of every 500 people would get cancer from the addition of hydrofluorosilicic acid to drinking water. This is also expressed as 200 out of 100,000 people.

Assuming a linear extrapolation of these concentrations for carcinogenic chemicals such as arsenic “to err on the side of caution in order to minimize avoidable risks” (OEHHA letter),²¹ the typical arsenic contamination seen in Ontario, Canada from hydrofluorosilicic acid certificates of analysis is 0.10-0.20ppb, (30-40%) also reflected in the NSF “averages” reported to the Congressional Hearings (see Table 4).

This means that 6-13 out of 100,000 people would be at risk for cancer as a result of the unnecessary addition of arsenic added to our drinking water from fluoridation chemicals. For a city the size of Toronto and surroundings, with about 5 million individuals, 650 deaths (13x5million) from lung/bladder cancer may be attributed to fluorosilicate usage.

It should be noted that 90 percent of the arsenic contributed by drinking water treatment chemicals is attributable to hydrofluorosilicic acid.²²

According to Ana Fan, PhD, Director of the Office of Environmental Health Hazard Assessment, California, "The lifetime risk of bladder cancer in the American population is about 20 to 30 per thousand, or nearly 40 per thousand for white males. The lifetime risk of lung cancer is about 10% (100 per thousand) in people who have smoked, and less than one-tenth that risk in people who have never smoked. Thus if male non-smokers drink water containing arsenic at the current MCL for their whole lives, about an estimated 5 % of all lung and bladder cancer that develop would be related to arsenic exposure."²¹

Policy Implications:

This study demonstrates that arsenic derived from fluorosilicates is associated with significant cancer risk. The addition of these water fluoridation chemicals should be discontinued.

Citations

20. Arsenic in Drinking water 2001 update. Subcommittee to update the 1999 Arsenic in Drinking Water Report, National Research Council, 2001.

21. Letter from Ana Fan in the office of Joan Denton, PhD, Director of the Office of Environmental Health Hazard Assessment (OEHHA), November 8, 2007 to Doug Cragoe.

22. Wang C, Smith DB, Huntly GM. Treatment Chemicals contribute to Arsenic Levels. Opflow (AWWA), October 2000.