Response to
Environmental Petition 221D filed by Ms. Carole Clinch
under Section 22 of the *Auditor General Act*
Received April 29, 2008

Petition requesting the discontinuation of artificial water fluoridation

August 27, 2008

Minister of Health and the Minister for the Federal Economic Development Initiative for Northern Ontario,
Minister of the Environment

Background:

Health Canada works with the provinces and territories to develop the Guidelines for Canadian Drinking Water Quality. The Guidelines are then used by each province and territory as a basis to establish their own requirements for drinking water quality. Fluoride is one of the many substances for which a guideline has been established. The Maximum Acceptable Concentration (MAC) for fluoride has been established taking into consideration all sources of exposure to fluoride, including foods and dental products. In Canada, the fluoridation of drinking water supplies is a decision that is made by each municipality, in collaboration with the appropriate provincial or territorial authority. This decision may also include consultation with residents, often through a referendum.

Fluoride occurs naturally in many source waters in Canada. It can also be added to drinking water as a public health measure to protect dental health and prevent or reduce tooth decay. The fluoridation of drinking water supplies is a well-accepted measure to protect public health and is strongly supported by scientific evidence. Fluoride is used internationally to protect dental health. It has been added to public drinking water supplies around the world for more than half a century, as a public health/dental health measure. The use of fluoride in the prevention of dental caries continues to be endorsed by over 90 national and international professional health organizations including Health Canada, the Canadian Dental Association, the Canadian Medical Association, the World Health Organization and the Food and Drug Administration of the United States.

As part of its ongoing review of the health effects of exposure to fluoride in drinking water, Health Canada convened a panel of experts in January 2007 to provide advice and recommendations based on the current state of relevant science with respect to the fluoridation of water. Advice was sought from the Expert Panel on five specific issues of concern including Total Daily Intake of Fluoride; Dental Fluorosis; Other Health Effects; Risk Assessment; and Drinking Water Fluoridation: Risks and Benefits. Discussions were based on topic-specific literature reviews developed and presented by some of the invited experts.

The report produced by the Expert Panel will be used to help inform the development of an updated fluoride guideline for Canadian drinking water, by ensuring our analysis is based on the latest sciencific evidence. The Expert Panel report was posted online and can be found at http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2008-fluoride-fluorure/index-eng.php.

Health Canada will continue to monitor the science and review new scientific reports and articles which explore possible links between fluoride and various health effects to ensure the health of Canadians is protected.

1. *The EPA Reference Dose of 0.06mg/kg/day for fluoride is 10-100 times higher than the other trace metals, despite evidence to show that appropriate reference doses for fluoride (Table 2) are not that much different. The Health Canada TDI is 105 µg/kg body weight/day for fluoride (0.105mg/kg/day for fluoride) which is 100 to 1,000 times higher than other trace metals. Neither EPA's reference dose nor Health Canada's TDI are protective for most of the health endpoints discussed in the above 9 analysis by 3 authors of the National Research Council Report on Fluorides in Drinking Water and a senior EPA chemist, who are internationally recognized as experts in the field of fluoride toxicology. Does Health Canada disagree with their assessment which demonstrates that fluoride, ingested for a lifetime at current recommended levels, is NOT protective of health for all individuals?*

4. *The above risk analysis demonstrates that endocrine organs may be the most susceptible part of the body to fluoride toxicity. Does Health Canada have evidence which clearly demonstrates that this analysis completed by some of the world's leading authorities on fluoride toxicity is incorrect? If so, how so?*

Answer to Questions 1 & 4:
It is not appropriate for Health Canada to comment on an individual's opinion. Health Canada's conclusions are based on internal scientific reviews of original relevant scientific studies that are published in internationally recognized peer-reviewed journals.

2. *According to Table 2-4 in the NRC 2007 Report on Fluorides, someone with Nephrogenic Diabetes Insipidus would exceed the EPA RfD and TDI from drinking water sources alone (this does not include fluoride from other sources such as food, beverages, dental products, drugs, air, consumer products, etc.). (10.5liters x 0.8mg/L= 8.4mg/day of fluoride) (10.5liters x 1.0mg/L = 10.5mg/day of fluoride) Does Health Canada have evidence that 10.35mg/day fluoride ingested just from water, for a lifetime for these individuals is protective of their health? If yes, please provide evidence.*

3. *According to Table 2-4 in the NRC 2006 Report on Fluorides athletes and workers also exceed the EPA RfD and TDI from drinking water sources alone (8.4liters x 0.8mg/L = 6.72mg/day of fluoride) (8.4liters x 1.0mg/L = 8.4mg/day of fluoride) These individuals also eat larger quantities of food and fluoride derived from food. Does Health Canada believe that 8.4mg/day fluoride ingested just from water, for a lifetime, is protective of the health for these individual who consume large quantities of water? If yes, please provide evidence.*

10. *"In Canada, actual intakes are larger than recommended intakes for formula-fed infants and those living in fluoridated communities. Efforts are required to reduce intakes among the most vulnerable age group, children aged 7 months to 4 years. " (Ont. Min Health 1999 Review). According to Table 2-4 in the NRC 2006 Report on Fluorides lactating mothers drink up to 10 liters of water a day. Can Health Canada provide evidence that lactating mothers (high water consumers) and their newborn children will not be harmed by the high dose of fluoride they would consume if they lived in a fluoridated city?*

Answer to Questions 2, 3 & 10:
Health Canada uses a population-based approach in risk assessment and therefore establishes drinking water guidelines based on the sub-population likely to be most affected. The sub-population most affected by exposure to fluoride is young children aged 22-26 months old, which is also the sub-population used for establishing a drinking water guideline which is protective of all Canadians. There are no data to suggest that exposure to fluoride at typical levels found in drinking water (e.g., at or below the Canadian maximum acceptable concentration of 1.5 mg/L) would result in adverse effects for those consuming larger quantities of drinking water.

5. *The above analysis demonstrates that the brain is particularly susceptible to fluoride toxicity. With 70 laboratory studies and 20 newly-translated studies around the world demonstrating a lowering of IQ with fluoride concentrations in drinking water very close to the current recommended doses (see discussion in NRC 2006) and other new studies demonstrating neurotoxic effects of fluoride (e.g. Alzheimer's, Down Syndrome), does Health Canada have evidence to demonstrate that there is an adequate margin of safety between toxic dose and safe dose and that fluoride is not implicated in these neurotoxic effects? Please provide evidence.*

6. *With the increased incidence of osteoporosis and arthritis, can Health Canada provide irrefutable evidence that water fluoridation has had no impact on these increases?*

7. *With the increased incidence of diabetes and kidney disease, can Health Canada provide irrefutable evidence that water fluoridation has had no impact on these increases?*

11. *Just 4 glasses (1 liter) of fluoridated water are sufficient to suppress thyroid function, according to the NRC 2006 report if you are iodine insufficient and weigh 70kg. Doctors recommend that we drink 2 liters a day. The risk analysis by Dr. Thiessen, co-author of the NRC 2006 Report on Fluorides in Drinking Water also demonstrates that the thyroid gland may be the most sensitive organ in the body to fluoride toxicity. Does Health Canada have evidence to disprove the Thiessen risk assessment and the NRC 2006 Report? Please provide references.*

Answer to Questions 5, 6, 7 & 11:
Based on currently available published scientific literature, the weight of evidence does not support the claim that fluoride contributes to these adverse health effects.

8. *According to the NRC 2006 Report, "Aluminum combined with fluoride in very small quantities (0.5mg/L) influences the following; Thyroid Hormone; Growth Hormone; Melatonin; Neural Transmitters; Insulin/Glucagon; Prostaglandins; Vasopressin etc." Knowing that the quantity of water therefore the dose of fluoride and hydrofluorosilicates from drinking water ingested by individuals cannot be controlled because you cannot tell people how much to eat or drink, can Health Canada prove that this NRC assessment by 11 international researchers in fluoride toxicity is incorrect and that there is no risk from ingesting hydrofluorosilicic acid and released fluoride ions? If so, how so?*

9. Aluminum-Fluoride (AlFx) is a small inorganic molecule that mimics the chemical structure of a phosphate which the body uses as energy currency and in signal transduction. Can Health Canada provide evidence that AlFx will not interfere with homeostasis, health or well-being when fluorosilicates and aluminum are ubiquitous in our environment? Please provide references.

Answer to Questions 8 & Q9:
There is no data to suggest that humans are exposed to hydrofluorosilicic acid through drinking water or that aluminum combines with fluoride in drinking water.

12. Health Canada currently recommends that municipalities buy fluoridation additives (hydrofluorosilicic acid) from companies to put into our drinking water. Should companies not pay municipalities for safe disposal of these CEPA-designated "toxic substances", "hazardous substances" and Transport Canada designated "dangerous goods"?

In Canada, the responsibility for managing hazardous waste rests primarily with the provinces and territories, who control the waste producers, the recycling, processing and elimination facilities, and the transportation of waste within their territory. The main definitions for hazardous wastes in Canada are under CEPA regulations for exports and imports of hazardous wastes and hazardous recyclable materials. Fluoridation additives certified for use in drinking water are not classified as hazardous waste in Canada.

13. The York Review 2000 discusses the very poor quality of the old epidemiology studies and the 2 members of the York Review have signed a petition asking for the discontinuation of water fluoridation. 2 members of the York Review advisory state: "Water fluoridation has not been proved to reduce tooth decay... No drug would be licensed for effectiveness or safety on the present evidence." The 1999 Ont Min Health Review states: "The magnitude of [fluoridation's] effect is not large in absolute terms, is often not statistically significant and may not be of clinical significance." The 2007 Pizzo Review states: "it is now accepted that systemic fluoride plays a limited role in caries prevention." Does Health Canada disagree with the conclusions of these 3 recent reviews that water fluoridation is ineffective?

As stated earlier, it is not appropriate for Health Canada to comment on the opinion or position of individuals or agencies. Health Canada's conclusions are based on internal scientific reviews of original relevant scientific studies that are published in internationally recognized peer-reviewed journals.

14. Would Health Canada please provide a single recent study which demonstrates that H2SiF6 or fluoride has any significant effect on the reduction of cavities?

For specific information on scientific studies, please consult Health Canada's Guideline Technical Document on Fluoride available on the Health Canada website at http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/fluor-eng.php or the original peer-reviewed studies.

15. *Health Canada and the Food and Nutrition Board of the Institute of Medicine in 1997 determined that 10 liters of water was the Upper Tolerance Limit (UL). The Chief Dental Officer for Health Canada stated in Dryden, Ontario that "you would have to drink 20,000 liters of fluoridated water to get a toxic dose". Does Health Canada agree with the Chief Dental Officer on this issue? If so, what is the difference between a toxic dose and a lethal dose?*

The statement attributed to Dr. Cooney is taken out of context: he was commenting on acute exposures causing immediate death. The Upper Tolerance Limit item you refer to is a chronic exposure value. The acute and chronic exposures you present are not comparable.

16. *Hooper Bay, Alaska, May 1992 reported a fluoride overfeed accident resulting in ONE DEATH, 260 poisoned, one airlifted to hospital in critical condition. How many fatalities and other health-related problems have resulted from overfeed accidents from fluoridation systems?*

Literature reports indicate that the incident in Hooper Bay was linked to extremely high fluoride concentrations, ranging up to 100 times the Canadian maximum acceptable concentration. Health Canada does not track such information, as fluoridation is a provincial/territorial responsibility.

17. *The Chief Dental Officer for Health Canada recently stated: "In for example, British Columbia you tend to have a lot of what we call tree-huggers or environmentalist folks. They tend to feel that they are not comfortable with fluoride in the water." (December 3 2007 to Thunder Bay City Council). Does Health Canada agree with this assessment that those concerned with the environmental impact of adding CEPA toxic substances to our drinking water, hence source water, are "tree-huggers"?*

The statement attributed to Dr. Cooney is taken out of context: he was saying that some areas of the country seem to have heightened concerns as compared to other areas of the country. British Columbia currently has about 4% of its population drinking fluoridated water, whereas provinces like Ontario, Manitoba and Alberta have over 70%.

18. *As a civil servant working at the taxpayers' expense does the Chief Dental Office for Health Canada have any obligation to present an accurate and balanced portrayal of all the actual research and the valid environmental, legal, ethical and public concerns regarding the complex subject of water fluoridation chemicals or is the Health Canada mandate for the CDO to present only the research which supports water fluoridation?*

Among the roles of the Chief Dental Officer, one is to present Health Canada's position on water fluoridation, which is based on internal scientific reviews of original relevant scientific studies that are published in internationally recognized peer-reviewed journals, as well as to promote effective, preventive public health measures such as water fluoridation.

An expert panel was formed to provide Health Canada with advice and recommendations on the current state of relevant science with respect to the fluoridation of water. The report from the

panel reinforces Health Canada's position that water fluoridation is important from a public health perspective and that our position on water fluoridation is sound. The report's recommendations are based on the latest science. In undertaking the study, Health Canada consulted with a number of experts including scientists from the Universities of British Columbia, Toronto, Iowa; scientists from many areas of Health Canada; and also received input from the Canadian Dental Association, the U.S. Environmental Protection Agency and public health experts from Canada and the U.S.

Health Canada endorses the fluoridation of drinking water to prevent tooth decay, but does not make the decision on whether or not to fluoridate drinking water. Provincial and territorial governments are primarily responsible for the safety of drinking water. In collaboration with their municipalities, they decide whether or not to fluoridate and the amount of fluoride to be added.

19. *The "no effect" levels in the Thiessen analysis below which no health harm occurs are lower than EPA's reference dose for fluoride. The EPA's reference dose for fluoride is lower than the TDI Health Canada uses. Can Health Canada provide irrefutable evidence that the TDI and the EPA reference dose are protective of all individuals and that the above analysis is incorrect?*

It is not appropriate for us to comment on the findings of a single study in this response. Health Canada's conclusions are based on internal scientific reviews of available relevant information, using a weight of evidence approach. For further information, please consult the Guideline Technical Document on Fluoride available on the Health Canada website at http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/fluor-eng.php.