

Evidence of Environmental Harm

Petition to the Auditor General of Canada # 221:

http://www.oag-bvg.gc.ca/internet/English/pet_221_e_30308.html

Fluoride in Ecosystems

“What happens to inorganic fluorides released into the environment? Once in water, inorganic fluorides can be taken up by aquatic plants. Fish and other aquatic animals can also take up inorganic fluoride from water and food and accumulate it in their bones or exoskeletons... Although inorganic fluorides may move around in the environment, and even change form depending on, for example, water chemistry, fluorine itself can not be degraded.”
Environment Canada http://www.ec.gc.ca/ceqg-rcqe/English/Html/GAAG_Fluoride.cfm

Destruction of marine and freshwater fish

“Inorganic fluorides affect basic physiological and biochemical processes of fish, plants and other aquatic organisms. By doing so, inorganic fluorides can slow growth and development, cause abnormal behaviour and lead to death. The degree to which these effects occur depends in part on the concentration and form of inorganic fluoride, period of exposure, water chemistry, and species and age of aquatic species. Some species that seem particularly sensitive include rainbow trout, fingernail clams, water fleas, and certain green algae.”

“The Canadian Water Quality Guideline (CWQG) to protect freshwater life is 0.12 milligrams of inorganic fluoride per litre of water.” Environment Canada
http://www.ec.gc.ca/ceqg-rcqe/English/Html/GAAG_Fluoride.cfm

Background concentrations of fluoride from fertilizers and pesticides are assumed to be between 0.1mg/L and 0.2mg/L. At 0.2 mg/L, fluoride is already at a “critical level” for some species of fish – e.g. trout, salmon and insects that fish feed upon.

“Levels of fluorides in surface water average about 0.2 parts of fluoride per million parts of water (ppm).” ATSDR Public Health Statement: Fluoride p3



The City of Kamloops in British Columbia, when it was fluoridated to 1.0 mg/L measured secondary effluent levels discharged to the Thompson River to 1.5 mg/L. This study and others, prompted Kamloops to stop water fluoridation in 2005. Dr. Foulkes 2002 Response to WAC 197-11-960 Environmental Checklist for Tacoma-Pierce County Health Department Fluoridation.

“A review of literature and documentation suggests that concentrations of fluoride above 0.2 mg/L have lethal (LD50) effects on and inhibit migration of "endangered" salmon species whose stocks are now in serious decline in the US Northwest and British Columbia.” Foulkes RG, Anderson AC. 1994 Impact of Artificial Fluoridation on Salmon Species in the Northwest USA and British Columbia, Canada. Fluoride Journal 27:4 220-226.

On the Columbia River a study was conducted to determine the effects of water fluoridation on the migration of fish. The study was set up with two ‘migration chutes’ where the fish had a choice of which chute to enter. One chute had 0.5 mg/L of fluoride, and the other chute had no fluoride. Downstream of both chutes, water concentrations were at 0.25 mg/L (the result of both water streams mixing). Surprisingly, the research found that fish wouldn’t go up the unfluoridated chute (as expected): they stopped at the water with 0.25 mg/L of fluoride. Therefore, fluoridated water is a barrier to fish migration. Daemker, DM, Dey, DB. Evidence for fluoride effects on salmon passage at John Day Dam, Columbia River 1982-1986, North American Journal of fisheries management, 1989, 9, 154-162

The mean concentration of fluoride in domestic sewage, which includes use of a fluoride product at 1.0 mg/L, is estimated to be: 2.3 mg/L in raw sewage; 1.15 mg/L in secondary effluent. Dr. Foulkes’ 2002 Response to WAC 197-11-960 Environmental Checklist for Tacoma-Pierce County Health Department Fluoridation andersfoulkes@cs.com



Photo: www.grandriver.ca/policyplanningregulations/erosion_dfo.pdf

Singer and Armstrong found secondary effluent levels in fluoridated (at 1.0 mg/L) Minneapolis-St. Paul of 1.21 mg/L and non-fluoridated Brainerd (0.13 mg/L in water) of 0.38mg/L. Singer L, Armstrong WD. 1977 Fluoride in Treated Sewage and in Rain and Snow. Archives of Environmental Health Jan/Feb P 21-23.

The mean value of domestic sewage including fluoride in the water supply at a mean concentration of 0.25 mg/L (range 0.1-0.4 mg/L) was reported as 1.55 mg/L fluoride in raw sewage and 0.63 mg/L fluoride in secondary effluent (range 0.3-1.5). Masuda TT. 1964. Persistence of Fluorides from Organic Origins in Waste Waters. Developments in Industrial Microbiology 5: 53-70.

“Studies show that elevated concentrations in fresh water receiving fluoridated effluent may persist for some distance. Bahls (19) showed that the effluent from Bozeman Montana of 0.6-2.0 mgF/L, discharged into the East Galletin River did not return to the background level of 0.33 mgF/L for 5.3 km. Singer and Armstrong (18) reported that a distance of 16 km was required to return the Mississippi River to its background level of 0.2 mg/FL after receiving the effluent of 1.21 mgF/L from Minneapolis-St Paul. Although dilution reduces *concentration* over distance, the *amount* of fluoride in effluent is either deposited in sediment locally or is carried to the estuary where it may persist for 1-2 million years (16) or may re-contaminate if dredging were to take place.” Foulkes RG, Anderson AC. 1994 Impact of Artificial

Fluoridation on Salmon Species in the Northwest USA and British Columbia, Canada. Fluoride Journal 27:4 220-226.

Warrington in a study for the British Columbia Ministry of Environment also identified 0.2 mg/L fluoride as a “critical level” for fresh water species. Warrington, PD, Ambient Water Quality Criteria for Fluoride. Technical Appendix 1990, British Columbia Ministry of Environment

Government of Canada Environmental Protection Act - estimated adverse effect thresholds (lethal, growth impairment and egg production) are 0.28 mg/L fluoride for fresh water species and 0.5 mg/L fluoride for marine species. Government of Canada 1993, Inorganic Fluorides, Canadian Environmental Protection Act (Priority Substances List Assessment Report).

Harm to animals (pets, livestock and wild animals)

Hypersensitive reactions to artificially fluoridated water [0.35 to 1.3 ppm Fluoride] causes skin lesions. Dental Fluorosis and Gingivitis [inflammation of gums] in Horses. No other known source of fluoride in diets. Other reproducible symptoms include colitis, thyroid suppression.

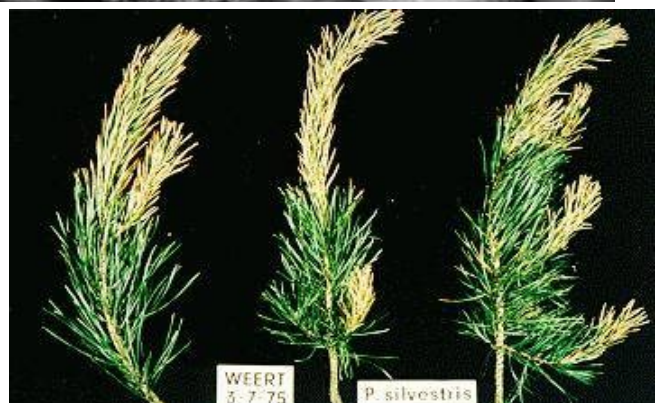
Photos: citations 119, 11



Harm to plants and trees

Fluoride damages trees including Scots Pine. New growth on branch tips is killed off in a phenomenon called tip burn.

“The fluoride concentrates in the margins and tip so it is these areas that generally are the first to show visible injury.”



Photograph by Davison & Weinstein
<http://www.ncl.ac.uk/airweb/fluoride/Fluoride1.htm>

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Hamilton, Ontario, Canada water staff measured 0.2ppm for fluoride levels in Lake Ontario (Board of Health Presentation, July 9, 2008)

<http://www.myhamilton.ca/myhamilton/CityandGovernment/CityDepartments/CorporateServices/Clerks/AgendaMinutes/BoardOfHealth/2008/July9BoardofHealthCommitteeAgenda.htm>

“The Woodward WTP produces approximately 350 million liters of water per day and adds HFS to reach a level about 0.7 mg/L of fluoride. Less than 0.1% of this water is consumed for drinking water and given that the primary target of water fluoridation are children, the water fluoridation therefore potentially serves only less than 0.5% of the total water produced. Most of the water provided to the community returns back in the form of sewage. The wastewater has high concentration of fluoride compared with potable water because of the fluoride added due to toothpaste use and some industrial discharges. A sample of the wastewater was tested for fluoride and the concentration was approximately 1.2 mg/L. Very little fluoride is removed in the wastewater treatment process and effluent had fluoride concentration of 1.05 mg/L.”

“There are many studies about the impacts of fluoride in aquatic environment and generally there is a consensus that fluoride concentration of about 0.6-0.7 mg/L has detrimental impact on aquatic life. If water fluoridation is stopped, it may be possible that the wastewater fluoride concentration would drop by 0.5-0.6 mg/L, which will be beneficial to aquatic environment.”

“The Canadian Council for Ministers of the Environment (CCME) is currently in the process of finalizing a Canada-wide Strategy for the Management of Municipal Wastewater. The draft strategy was posted for public consultation and comments. The draft strategy proposed a compliance requirement of end of the pipe toxicity testing for the wastewater treatment plants. It is anticipated that this requirement will be included in the Certificate of Approval for the Woodward WWTP upgrades. The fluorides in wastewater can't be removed in the treatment processes and as such the toxicity associated with it will be a significant challenge, if source controls are not implemented. Failure to achieve toxicity targets will require substantial future investments in the wastewater treatment systems.”

Operator Health and Safety

“Hydrofluosilic Acid (HFS) is an extremely hazardous chemical and poses significant health and safety risk to City's staff. Though significant safeguards have been in place at the water treatment plant, the risk of any chemical spill can't be completely overruled. There are significant risks during delivery and filling operations and any chemical spill would require extensive resources to manage and control the damage.”