

## Medical or “health” effects of tritium and Canada’s lax standards

- Carbon, hydrogen, and oxygen are the basic building blocks of organic matter – what all living things are made of.
- Tritium, as a radioactive form of hydrogen, combines with oxygen to form radioactive water (tritiated water) which enters freely into all living things.
- Tritium, as a radioactive form of hydrogen, becomes incorporated into organic matter as “organically-bound tritium” (OBT). In this form, it can remain within living organism for months or years.
- There is evidence that tritium adheres to genetic material (DNA molecules), where its radioactivity poses special risks of causing cancer and genetic damage.
- Exposure to tritium has been shown to cause miscarriages, birth defects, permanent genetic damage and a host of other health problems in laboratory animals.
- International standards originally regulated all radioisotopes based on their energy. These standards allowed exposure to very high levels of tritium because its beta particle is less energetic than other forms of atomic radiation. However, the biological harm caused by tritium exposure is 15-30 times greater than would be expected from its energy alone.
- Most jurisdictions have gone beyond current international standards, and are tightening standards for acceptable levels of tritium based on scientific evidence of its risks. For example, the European Union standard for tritium in drinking water is 100 becquerels per liter, and in California a limit of 15 becquerels per liter is being considered.
- **Neither the Canadian government nor the Canadian Nuclear Safety Commission has acted to limit tritium exposure.** Ottawa has only set a voluntary guideline of 7000 becquerels per liter for drinking water; that level is used as a regulatory standard in Ontario.
- A scientific advisory committee (ACES) to the Government of Ontario recommended in 1994 that the Ontario standard be reduced to 100 Bq/L immediately, and then to 20 Bq/L after five years; this is 350 times more stringent than current Ontario regulations.
- Toronto City Council, at the urging of the city’s Medical Officer of Health, passed a resolution in July 2006, endorsing this (ACES) recommendation to dramatically tighten the tritium standards for drinking water.