

40 St. Clair Avenue West
3rd Floor
Toronto, Ontario
M4V 1M2

Tel 416.212.7779
Fax 416.212.7595

40, avenue St. Clair ouest
3^e étage
Toronto, Ontario
M4V 1M2

Tél 416.212.7779
Télééc 416.212.7595



Ontario

**Advisory Council on Drinking Water
Quality and Testing Standards**

**Le Conseil consultatif sur les normes
de qualité et d'analyse de l'eau
potable**

May 21, 2009

The Honourable John Gerretsen
Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario M4V 1P5

Dear Mr. Gerretsen:

Re: Review of the Ontario Drinking Water Quality Standard for Tritium

On February 21, 2007, former Minister of the Environment, the Honourable Laurel C. Broten requested the Ontario Drinking Water Advisory Council to provide advice on the Ontario Drinking Water Quality Standard for Tritium.

The request came as a result of a letter sent to the Minister by the Medical Officer for Health for the City of Toronto, which asked the province to adopt more health-protective Ontario Drinking Water Quality Standards for tritium and other radionuclides, and to specifically take into consideration the 1994 recommendations on tritium made by the former Advisory Committee on Environmental Standards in their report entitled "A Standard for Tritium: A Recommendation to the Minister of the Environment and Energy".

Subsequently, Minister Broten also made a request for the Council to consider a Greenpeace Canada report authored by Dr. Ian Fairlie entitled "Tritium Hazards Report: Pollution and Radiation Risks from Canadian Nuclear Facilities".

The Council has taken considerable effort to review all of the health and risk aspects of tritium exposure to the public from drinking water. At an early stage, we determined that the matter was considerably more complex than our review of other drinking water Standards, and that it was of great interest to a wide-range of stakeholders, including those involved in the nuclear field.

We undertook the review of the pertinent literature and research currently available, reviewed the approach taken by other jurisdictions and organizations in developing their own guidelines and standards, and met directly with those who had considerable interest in the matter. We also held a public consultation to hear directly from those with views on what the Ontario Drinking Water Quality Standard for tritium should be, and their rationale. Sixty-five individuals and organizations made presentations to the Council, and we received over 500 written submissions.

The attached report summarizes the work and findings of the Council. Part I highlights the review by the Council, the information sources that we considered, and the various health and technical issues related to tritium. Part II of the report presents the Council's findings, conclusions and subsequent recommendations.

In endeavouring to propose a new Ontario Drinking Water Quality Standard for tritium, we noted that, traditionally, the risk assessment approach used for radionuclides is distinctly different than the approach used for chemical contaminants. The Council carefully assessed these differences, with a particular focus on health outcomes and risk to the public.

In both Canada and Ontario, when a Drinking Water Quality Guideline or Standard is set, what we are saying, in essence, is that it is safe to drink the water each and every day for a lifetime at that level.

For known or suspected carcinogens (which include radionuclides), in many jurisdictions, the goal is to reduce the exposure to zero. However, the actual level we endeavour to achieve is a risk of 1 in 1 million or 10^{-6} (meaning 1 new excess cancer occurrence over existing background cancer rates in 1 million people, exposed over a lifetime (of 70 years)). The Council's research confirmed that the 1 in 1 million level is the furthest extent to which drinking water and other contaminants are normally regulated, as it represents a level that is generally accepted to be "essentially negligible".

Practicability is then taken into consideration, including technical limitations of treatment and removal, the cost of meeting a certain level, and the limitations of monitoring and laboratory testing.

Taking all the above factors into consideration, the Council concluded that, for tritium in drinking water in Ontario, a risk of 10^{-6} was both practical and achievable. We further noted that, in deriving the proposed Standard, we were concerned with long-term (i.e. chronic) low-level exposure and that the Standard was not applicable to urgent or emergency events at facilities that may release tritium.

To hone in on a proposed value for the Standard, we considered several numerical variations that utilized models from other jurisdictions, including the approach used by Health Canada, and reflected a risk of 10^{-6} . These variations resulted in a range of 7 to 109 becquerels per litre (Bq/L). The current Standard is 7,000 Bq/L.

In order to identify a proposed Standard from within this range, we then turned to information provided by two key stakeholders, which noted that a Standard of 20 Bq/L, applied as a running annual average, was both practical and achievable. In fact, this level is already being achieved at all municipal drinking water treatment plants in Ontario, even in the vicinity of nuclear facilities.

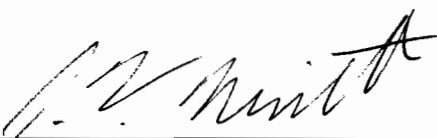
Over the last several decades, the federally-regulated nuclear industry has worked to significantly reduce the levels of tritium discharged into waterways. The result is that no one in Ontario is currently being exposed to tritium from municipal or communal drinking water supplies at levels that would be considered an unacceptable risk to public health.

In arriving at a proposed Standard for tritium in drinking water, it should be recognized that we are suggesting an approach for protecting public health in this province that is quite unique and different from the one traditionally used for the management of radiation risks in the nuclear field. Nonetheless, we have followed the principles and science that these organizations have established.

The information reviewed by the Council indicates that tritium is the only radionuclide of concern that Ontarians are exposed to in drinking water, on an ongoing basis, at levels above the natural background. Therefore, we do not consider our approach for tritium to be applicable to the setting of Standards or Guidelines for other radionuclides. The Council's advice on other radionuclides will be dealt with separately.

I would be pleased to meet with you or your staff in the future to answer any questions regarding the Council's advice on the Ontario Drinking Water Quality Standard for tritium.

Sincerely,



Jim Merritt, Chair
Advisory Council on Drinking Water
Quality and Testing Standards

Attachment: *Report and Advice on the Ontario Drinking Water Quality Standard for Tritium*