



**CANADIAN ENVIRONMENTAL LAW ASSOCIATION**  
L'ASSOCIATION CANADIENNE DU DROIT DE L'ENVIRONNEMENT

**A Submission to the Ontario Drinking Water Advisory Council**  
**Re: the Tritium Drinking Water Standard**  
**Wednesday, March 26<sup>th</sup>, 2008**

**Background**

The Canadian Environmental Law Association (CELA) is a legal aid clinic in Ontario with a dual mandate to represent low income Ontarians seeking environmental justice and to improve our laws to protect the environment and human health. Since its formation in 1970, CELA has focused on the need for safe drinking water, pollution prevention, and toxic use reduction. CELA has represented clients with concerns about exposures to nuclear dump sites on the Great Lakes and commercial operations utilizing radionuclides, including tritium, generated by the nuclear cycle.

As well, we have represented the victims of this Province's largest drinking water contamination tragedy, the Concerned Walkerton Citizens, both in the Inquiry into that tragedy and as partners in the successful campaigns to reform Ontario's drinking water protection laws. CELA welcomes this opportunity to once again make submissions on the Drinking Water Standard for Tritium in Ontario's Drinking Water. CELA made submissions to the Advisory Committee on Environmental Standards (ACES) in 1994 and again to the 1999 Proposal by Ontario to Adopt the Canadian Drinking Water Quality Guideline for Radiological Characteristics as an Ontario Drinking Water Objective for Radionuclides.

CELA, as a member of the Environmental and Occupational Carcinogens Working Group of the Toronto Cancer Prevention Coalition, raised concerns in 2005 that tritium emissions were not routinely being included in the annual municipal drinking water reports required by the *Safe Drinking Water Act* because these data were not being supplied to the municipalities by the operators of the power plants. We supported the request of the Medical Officer of Health (MOH) of Toronto, Dr. David McKeown, that the Ontario Government revisit the recommendations of the ACES committee and consider a more health-protective standard be required for Tritium, a request that led to this consultation.

Many of the recommendations we are making today are reiterations of ones we have made in the past.

## **New imperatives**

What should be different in your review of these recommendations nine years after the ACES report? Ontario has experienced serious drinking water contamination incidents across the province, and these experiences have given us new knowledge and insight on the rigour that is needed to provide a fail-safe, multi-barrier regulatory framework for drinking water protection that includes source protection, a *Safe Drinking Water Act*, and new roles and responsibilities for operators and regulators based on health protection. The first step in requiring similar controls for tritium would be to prevent its release altogether, followed by other improvements in monitoring, operations, and disclosures.

In addition, the Province has also just embarked on a commitment to toxic use reduction. In a press release on November 20, 2007, Premier McGuinty announced that Ontario will be pursuing a Toxic Use Reduction Strategy:

“The McGuinty government’s new toxins reduction strategy will include a range of measures to protect our health. It will include introduction of new toxic reduction legislation to reduce pollution, inform and protect Ontarians from toxic chemicals in the air, water, land and consumer products.”

We anticipate the government will be introducing legislation for toxics use reduction by the end of 2008. The nuclear power industry should not fall outside of this Province’s considerable efforts to limit substances known to be harmful, and to seek safer alternatives to protect human and ecosystem health.

These new tools give us new opportunities to protect the drinking water in the Province that did not exist when previous consideration was given to the standard for Tritium.

- Recommendation #1:

The Province of Ontario should adopt its own Drinking Water Objectives for Radionuclides. The level of protection that should be achieved in adopting such Drinking Water Objectives should be analogous to the level of protection that Ontario follows for Drinking Water Objectives for chemical substances in water; in particular, it should provide a risk of no more than one in a million excess fatal cancers, and should provide protection against non-fatal cancers; teratogenic effects and other non-cancer illnesses.

- Recommendation #2:

CELA advocates an immediate 20 bq per litre limit in drinking water for tritium (tritiated water) with a phase-in over five years to reach 5 bq per litre. That 5 bq per litre level should in turn eventually be reduced if tritium levels in background continue to decline because of the passage of time from the dates of the above-ground weapons tests to eventually reach zero.

- Recommendation #4:

An assessment of other environmental effects of Tritium in water is needed for protection of aquatic and other wildlife dependent on waters in the vicinity of nuclear power plants.

- Recommendation #5:

The standard should require mandatory notice and advice to the public from the Medical Officer of Health whenever radionuclide levels in sources of local raw drinking water are measured at or above background levels. For example, for tritium, warnings should be provided whenever levels reach 5 becquerels per litre or more. This would mean that the operators of the nuclear plants would need to provide immediate notice on exceedences to the MOH.

- Recommendation #6:

The Ontario *Safe Drinking Water Act* places the primary responsibility for safe drinking water on municipalities and on drinking water plant operators. This imposes a new, higher level of accountability and disclosure obligation from plant operators to those municipalities on releases of tritium.

The results of the monitoring for radionuclides in drinking water should be made available directly and immediately to the Medical Officer of Health and to the public on a web-site, and in newspapers, widely advertised and up-dated daily, for all of the communities in proximity to the nuclear generating plants. Emergency response plans should be known to the public as well as to plant operators.

- Recommendation #7:

Where tritium is detected at levels in excess of 20 bequerels per litre, the local municipality and/ or Ontario Power Generation and/or the source responsible for the elevated levels should provide alternative water supplies to the public. The standard should be measured and reported upon on an instantaneous (real-time) basis, instead of being averaged annually or monthly.

- Recommendation #8:

The Guideline should also specify monitoring frequency for radionuclides, which should be daily for all of the drinking water intake locations near all nuclear generating stations.

- Recommendation #9:

Other monitoring periods at other locations could be established based on results and based on known emitters of radionuclides. In cases of spills or accidents where drinking

water intakes much further away may draw in tritiated water, monitoring frequency for all of the drinking water intakes in the body of water subject to the spill or accident should be increased to daily until the levels return to background.

- Recommendation #10:

CELA recommends the Minister exercise the discretion under the *Clean Water Act, 2006* to set up a Great Lakes Source Protection Advisory Committee to bring expertise to bear on the examination of tritium threats cumulatively.

### **Achieving a health-based standard**

The risk of cancer fatalities from tritium at current Canadian levels is 340 excess fatal cancers per million people. The current chemical drinking water objectives are almost all set at levels that provide a risk of 1 to 10 excess fatal cancers per million people.

The primary reason for this difference is because the excess cancers predicted from exposure to the radioactive substances are calculated by assuming one year of consumption of the drinking water. Then the risk for a whole life time is calculated as if that year of consumption is the only consumption.

By contrast, for the chemical substances, the assumption is that people consume the drinking water for their whole lifetime – commonly set at a 70 year exposure.

Standards for protecting public health and the environment from radioactive substances that are less stringent than standards for chemicals cannot be justified.

The Advisory Committee on Environmental Standards (ACES) was charged to enquire into this very issue in 1994 for the purpose of setting a drinking water standard for tritium. It reviewed the above-described differences in approach to standard setting, and concluded that it was not appropriate to assume only a one year exposure in calculating the risk.

In the 1980s CELA organized a day long seminar with Dr. Rosalie Bertell at York University. That was followed by a debate between Dr. Ernest Sternglass and nuclear regulators in Ontario at our annual meeting forum. The lessons we drew from those events were the conclusions that Doctors Sternglass and Bertell reached in their early research for Westinghouse in the US. They found that that unlike other dose-response chemical exposures, low and chronic doses of radiation are very harmful to health. This has informed the CELA position for three decades that all nuclear contamination must be prevented to protect human health.

There appears to be little further assessment done on the risks to the most vulnerable sectors of the population. For example, the particular issues of radiological effects on children might include greater exposure to children; developmental susceptibility; greater uptake of contaminants; differing metabolism and other differences between risks to children compared to risks to adults. Assessments based on a methodology

geared to adults are insufficient to protect children. A similar concern applies to pregnant women and their unborn children. Effects on future generations from impacts on today's young girls and adolescents do not appear to have been assessed.

### *ALARA and precaution*

In response to the Committee's question regarding the use of the "as low as reasonably achievable" (ALARA) approach, as distinct from the precautionary approach: CELA remains committed to a drinking water standard for tritium that is based fundamentally on the need to protect human and ecosystem health. This requires that a precautionary and protective standard be established. Consideration of the means for achieving it should flow from that standard and not the other way around. It is not appropriate for ALARA or another exposure-based approach to take precedence over a health-based standard; instead, the standard should be used to drive policy and innovation.

ALARA was developed as an occupational health and safety standard and should not be applied to drinking water and other broader environmental exposures. The use of ALARA also implicates social and economic considerations that, if given primacy over a health-based standard, would likely serve to trump that standard. Furthermore, even in the occupational health and safety context, CELA does not support use of the ALARA standard.

By contrast, ALARA may be interpreted to justify continued and even growing reliance on nuclear generation. CELA does not support Ontario's energy reliance on nuclear power because it is too hazardous to human health, and too expensive to make safe. CELA supports investments in safer alternatives. That said, any new plants must conform to a standard of zero discharge for Tritium and operating plants will need to reach that standard in the near term.

### *Body burden*

During your consultations, your Council was querying exposed members of the Ontario public as to what their body burdens of radiation might be. The burden of proof and testing should lie with those who have exposed these people to radiation. The governments whose regulations purport to protect the public from exposures should assist citizens in quantifying and evaluating their body burdens. The lack of widespread health-based information on exposures is an indication that our current standard is not health-protective.

### *Integration with Clean Water Act, 2006*

The *Clean Water Act, 2006* contains provisions that the Province should utilize in relation to nuclear power plants. For example, section 89 of the Act imposes a duty to

report certain drinking water health hazards resulting from a substance that is being discharged or is about to be discharged into raw water supplies.

Source Protection Plans will need to include threats from tritium and other radionuclides to drinking water. As all of the existing nuclear generation plants are on the shores of the Great Lakes, all of the provisions applying to the Great Lakes in the *Clean Water Act, 2006* need to apply to threats of Tritium contamination.

The *Clean Water Act, 2006* requires that the *Great Lakes Water Quality Agreement*, the Canada-United States *Boundary Waters Treaty* and the *Canada-Ontario Agreement Respecting the Great Lakes* be considered in source protection for the Great Lakes. This should be reflected in standard setting for tritium. Our obligations to share critical information with other jurisdictions in the Great Lakes and downstream in the St. Lawrence River should be explicit in the standard.

CELA also recommends the Minister exercise the discretion under the *Clean Water Act, 2006* to set up a Great Lakes Source Protection Advisory Committee to bring expertise to bear on the examination of tritium threats cumulatively.

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Submitted on behalf of the Canadian Environmental Law Association by Sarah Miller, Water Policy Researcher and Coordinator, with assistance from other CELA staff.

CELA Publication #605 ~ ISBN #978-1-897043