

Standards and Guidelines for Tritium in Drinking Water

Overview

The *Standards and Guidelines for Tritium in Drinking Water* study is a compilation of authoritative criteria underlying the regulation of tritium in drinking water in:

- countries that operate CANDU and other nuclear reactors
- European Union countries
- other developed countries where tritium may be released to the environment from nuclear facilities

Objectives

- Summarize criteria on a national and international basis from readily available public sources of information, along with the scientific and policy bases underlying these criteria.
- Discuss the Canadian federal drinking water guideline of 7,000 becquerels per litre (Bq/L) relative to criteria or guidance from other jurisdictions.
- Provide a perspective on the need for revisions to the existing regulatory approach for tritium by providing representative data on the current levels of tritium in drinking water sources near major Canadian facilities that release this radionuclide.

Main Findings

- Internationally accepted radiation protection concepts suggest a rounded guideline reference level (GL) of 7,600 Bq/L (a GL is the maximum acceptable concentration for tritium in drinking water). These concepts include the International Commission on Radiological Protection's dose-risk estimations and dose-conversion factors, as well as the reference dose level of 0.1 millisievert (mSv) per year adopted by the World Health Organization (WHO).
- The European Union, the United States, Australia and Finland use variations of the WHO approach to arrive at different GLs.
- In Canada, the GL is 7,000 Bq/L.
- Current tritium levels in Canadian drinking water near nuclear facilities are several orders of magnitude lower than GL of 7,000 Bq/L, well below the European Union's GL of 100 Bq/L and generally below the California public health goal of 14.6 Bq/L.

Figure 1. International standards and guidelines for tritium in drinking water

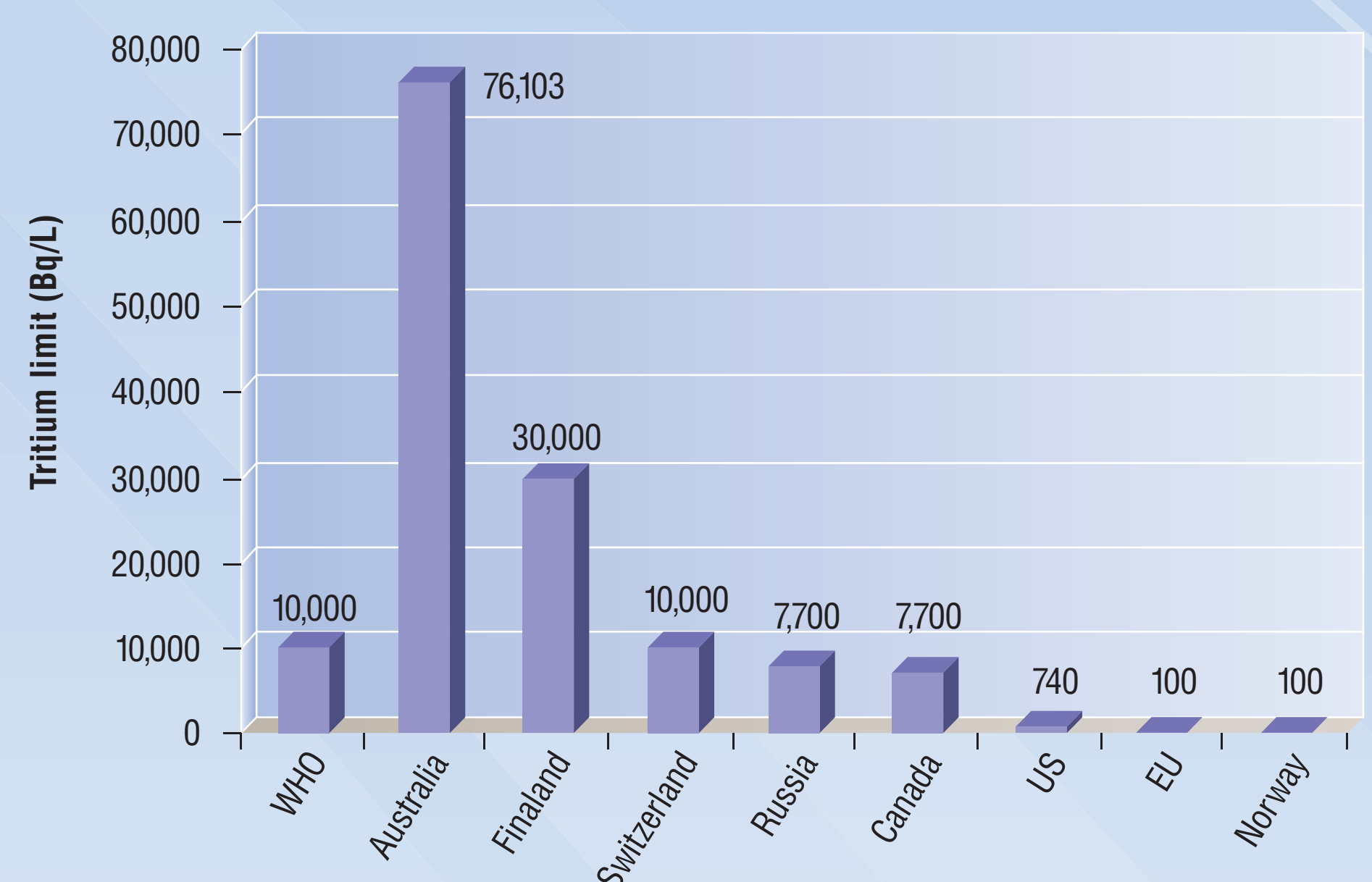


Figure 2. Comparison of drinking water tritium levels near Canadian nuclear sites to national and international guidelines and standards

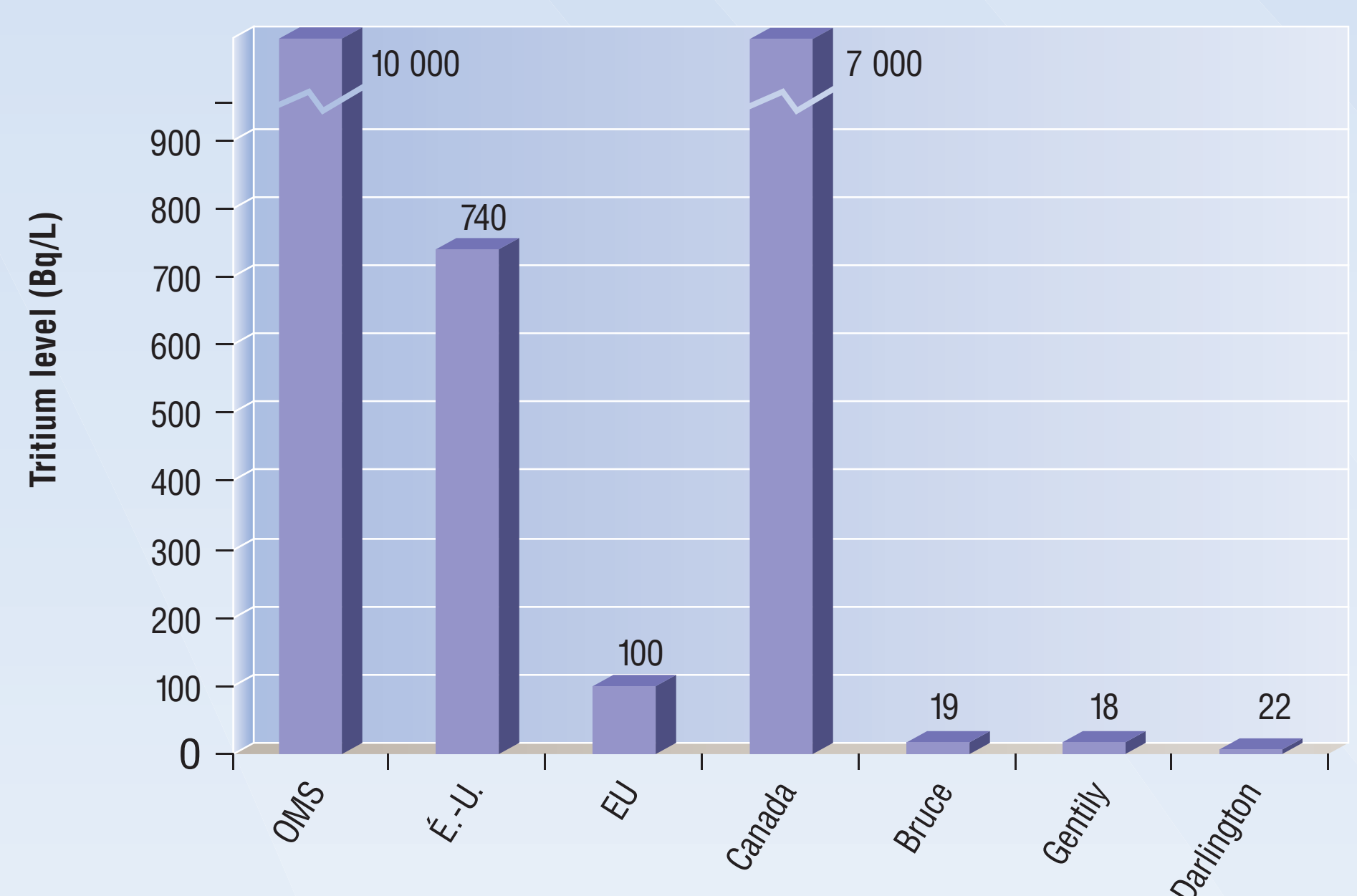


Table 1. International limits for tritium in drinking water

	Number of Power Reactors		Tritium Limit or Guideline (in drinking water) (Bq/L)
	CANDU	Total	
Canada	18	18	7,000
European Union	2	126	100*
Finland	0	4	30,000
Australia	0	0	76,103
Russia	0	31	7,700
Switzerland	0	5	10,000
United States	0	103	740
WHO	n/a	n/a	10,000

* The European Union has elected to use a tritium guideline value of 100 Bq/L as a screening parameter only.