

## **Tritium in Our Drinking Water. How Much Is Considered Safe?**

Standards for tritium in drinking water range from 20,000 picocuries per liter in drinking water to 400 picocuries.

EPA: EPA's standard for tritium in drinking water is 20,000 picocuries per liter.

Ontario Canada's Drinking water quality standard for tritium is  
540 picocuries per liter.

California's recommended public health goal for tritium in drinking water is 400 picocuries per liter.

The Department of Energy agreed to an action level of 500 picocuries per liter for tritium in surface water in the clean up at Rocky Flats - a level corresponding to Colorado's standard for tritium in surface water.

Therefore when reactor owners and the NRC dismiss public concerns about leaks, saying that tritium levels measured offsite by the plant operators were well below the EPA drinking water standard of 20,000 picocuries per liter and are "safe. This is not correct because:

All radiation protection regulations and the most recent report of the National Academies BEIR VII report concluded that the hypothesis that best fits the facts is that every exposure to radiation produces a corresponding cancer risk – low exposures produce low risk, and that risk increases with exposure. There is no threshold below which there is zero risk. The EPA's method of expressing this reality is to set a Maximum Contaminant Level Goal (MCLG) which corresponds to zero health risk. The EPA value for MCLG for all radionuclides, including tritium, is zero.

We already knew that tritiated water acts like ordinary water and passes right through the reverse osmosis membranes and activated carbon cannisters of a desalination plant.

Radiation damage from tritium can be insidious and long-lasting, producing mutations and cancers, especially in the rapidly dividing cells of fetuses, children, reproductive organs and the blood-forming organs. The relatively weak beta radiation from tritium does not penetrate far into the body. The danger comes from within in something of a Trojan horse attack. Tritiated water travels everywhere that water goes. So tritium can be used instead of hydrogen in the biosynthesis of DNA and other bodily components. With a half life of 12.3 years, a tritium atom in a DNA strand is a potential bomb, able to change that DNA, sometimes leading to cancerous or mutant cells. No matter how small the amount of tritiated water, there is no known "threshold" dose, i.e. absolutely safe.\*

In practical terms there has always been background radiation from naturally occurring tritium, other radioactive elements and cosmic rays, enabling evolution as well as trouble. The U.S. limit for tritium is calculated to yield a dose of 4 millirems per year, equivalent to about half of a chest x-ray. This is about 1.3% of natural background radiation from all sources,\*\* or possibly up to 25% if the "Trojan horse" effect on DNA is considered. We are probably OK if the present small leaks from Indian Point don't get worse, or there are ruptures of critical old pipes and tanks or a blowout.

\* G. Edwards, Health Dangers of Tritium Emissions, via Google. J.B. Little, Radiat. Res. 1986 Aug; 107(2):225-33. A.Rasmuson, et al., Mutat. Res. 1988 Mar-Apr;207(3-4):127-33.

\*\* "Tritium" and "X-rays", via Google/ Wikipedia.