



## Technical White Paper: Radon in Drinking Water Regulations: A Brief History

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Developed by CRCPD's Liaison to the Association of  
State Drinking Water Administrators  
and the American Water Works Association  
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In the 1986 amendment of the Safe Drinking Water Act (SDWA), the U.S. Environmental Protection Agency (EPA) was directed to promulgate regulatory standards for radon and other radionuclides in drinking water for large water systems. The radionuclides rule was first proposed in July 1991 and included a radon in water standard. Such rule proposals are inherently controversial since radionuclides and radon are recognized as cancer causing substances. Consequently their maximum contaminate levels (MCL) in water are automatically set to a goal of zero additional cancers. Due at least in part to the number of comments received on the radon in water standard, the rule was not promulgated, and because of delays in its implementation, the EPA was sued. In the following consent decree, the EPA agreed to publish radionuclide in drinking water rules by April 1993.

In 1992, Congress extended the promulgation deadline and requested a reevaluation of the earlier radon health risk assessments and the creation of an action plan to address the regulation of radon. This action plan was to account for exposure pathways from both water and air. The publication of the radon in drinking water rule was further delayed by controversy over assessments of the extrapolation of risks, nature of the risks and the mitigation cost analysis. During 1996, congressional amendments to the SDWA permitted the EPA to establish an alternative MCL (AMCL) that allows a higher concentration of radon in water than the lower MCL. The AMCL was set at a radon concentration at which the indoor radon risk from waterborne radon is equal to the average risk from exposures to radon in outdoor air. In situations where a water systems radon concentration exceeded the MCL, but not the higher AMCL, the EPA could allow risk reduction through focused, indoor air radon reduction programs for the populations served by those water systems. Mitigating radon in air may achieve greater risk reduction than mitigating radon in water. EPA approval of the less stringent AMCL option requires the state or local water provider to implement a multimedia mitigation (MMM) plan that obtains a risk reduction equivalent to the adoption of the MCL. Required elements of a MMM plan include:

- Involvement of the public in the careful review of the plan,

- Setting quantitative goals for reducing radon in existing and new homes,
- Establishing strategies for achieving quantitative goals, and
- Carrying out a plan for tracking and reporting results.

Additionally, the 1996 SWDA amendment required the EPA to contract with the National Academy of Sciences (NAS) to:

- 1) Study and report on health risks associated with exposure to radon in drinking water,
- 2) Assess various radon mitigation measures,
- 3) Summarize contradictory advice among various advisory organizations, and
- 4) Evaluate the technical and scientific bases for their disparities.

The 1999 NAS report has estimated that about 20,000 lung cancer deaths occur in the United States each year from indoor exposures to radon produced in soils, rock formations and water. It also concluded that using techniques to reduce indoor airborne radon and its related lung-cancer risk does make good public health sense. The NAS committee concluded: “evaluating whether a multimedia approach to radon reduction will achieve an acceptable risk reduction in a cost effective and equitable manner will be a complex process.” It also noted MMM implementation will require significant cooperation between the partners, the EPA, state agencies, water providers and local communities.

In November of 1999, EPA released the currently proposed radon in water rule (MCL/AMCL) separate from the overall radionuclides rule. During the late 1990’s and early 2000, EPA held several regional facilitated workshops with representatives of state drinking water and radon programs to gather information and to discuss states’ implementation issues. After the 2000 election, changes in federal executive administration and agency administrative management caused consecutive delays in the radon in water rule promulgation. During Fall 2003, at congressional request, EPA’s radon and drinking water programs held additional information gathering meetings with select state drinking water and radon program officials regarding consideration of a single MCL. No additional, official EPA actions have taken place since these sessions were held.