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Statement at Public Hearing on EPA's Proposed Yucca Mountain Radiation Standards
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Public Citizen is a consumer advocacy organization with more than 150,000 members nationwide. We were part of the coalition of nongovernmental organizations that successfully challenged EPA's first standards for the proposed Yucca Mountain repository.

Unfortunately, EPA's second attempt at drafting radiation standards is yet another example of setting regulations to guarantee that the site will get licensed, rather than setting health-based regulations that the site must meet to get licensed. It is not EPA's job to ensure that Yucca Mountain can be licensed by the Nuclear Regulatory Commission. It is EPA's job to set a standard that will be protective of public health for all generations into the future.

Contrary to EPA's claim, the draft radiation standard will not protect the public for 1 million years. Extending the concept of individual dose standard to 1 million years is meaningless when the standard after 10,000 years is 14 times greater than what EPA itself has stated is protective of public health, and more than 23 times higher than the first 10,000 years. **In fact, EPA's proposed rule is the least protective radiation standard in the world.** No other U.S. or international radiation protection standard permits a dose of 350 millirems per year to individuals.

EPA itself has for decades declared any radiation dose above 15 to 25 millirems per year to be inadequate to protect public health. It has repeatedly gone on record that doses of 100 millirems per year produce unacceptable levels of risk. In its final rule for the first Yucca radiation standard, EPA wrote in its response to a comment proposing a 70 millirems-per-year standard:

The risk level associated with 70 millirems (about 4×10^{-5}) is about five times as high as the risk level associated with the individual-protection limit. This is well above the NAS-recommended level *and unprecedented* in the current regulations of this and other nations for this activity.¹ [Emphasis added]

In addition to being completely inconsistent with the agency's own previous recommendations, EPA's proposed standard is "justified" by using incorrect and fraudulent claims.

¹ "Public Health and Environmental Radiation Protection Standards for Yucca Mountain, Nevada (40 CFR Part 197) - Final Rule, Response to Comments Document," pages 79 and 80 (Section 4, page 4 and 5)

First, it is completely false to claim that the level of radiation is safe as long as it does not exceed the highest levels of background radiation the highest radiation-prone states, such as Colorado. Background levels of radiation across the U.S. are highly variable, with Colorado being significantly above the average. No U.S. or international regulations use background radiation to set public health standards for radiation exposure. According the recent National Academy of Sciences' BEIR VII report on radiation health risks, any amount of radiation will increase an individual's risk for getting cancer.² About 3 percent of fatal cancers are due to exposure to background radiation, which means that 18,000 people die each year in the United States from exposure to background radiation.³

Second, by including radon exposure as part of natural background radiation, EPA is dishonestly inflating background levels. Radon is normally never included as part of background dose, because indoor radon exposure is a man-made public health risk. EPA itself has classified radon as a known human carcinogen. Also according to the EPA, radon exposure is the second leading cause of lung cancer in the U.S.⁴ When high levels of radon are detected in buildings, renovations are usually made to reduce radon that goes into the building. The EPA has found that radon comprises about 87% of the background radiation in Colorado.⁵

Third, it is scientifically fraudulent to use the median dose to set the radiation standard, rather than the mean dose. Scientists around the world have rejected this approach for decades, as the projected median exposure does not take into account the possible higher doses. EPA itself has always used the projected mean exposure for its work in the past. According to DOE's Total System Performance Assessment for Site Recommendation, at the time of peak dose (after the waste packages corrode and fail), the mean dose of the many computer simulations is about 600 millirems per year, while the median dose is about 200 millirems per year. The repository could not meet a standard that required the mean to be less than 350 millirems per year, but would meet the standard if the median were used instead of the mean.

EPA's general position for decades has been to regulate exposures to keep the risk to the public at one cancer in one million people. According to the BEIR VII report, 350 millirems per year over one's lifetime will cause cancer in approximately one out of every 36 people exposed—a risk 3 to 5 orders of magnitude greater than the range that EPA has always used before.

DOE calculations show the mean exposure is more than 3 times the median exposure, under EPA's 350 millirem per year standard. Therefore, *some people will actually receive about 1,000 millirems per year, producing a cancer in 1 in every 10 people exposed.* Because this is not a maximum, but rather an average dose, more people would get much higher doses, resulting in

² *Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase 2*, Committee to Assess Health Risks from Exposure to Low Levels of Ionizing Radiation, Board on Radiation Effects Research, National Academy of Sciences, 2005, <http://www.nap.edu/openbook/030909156X/html/>.

³ Kristin Shrader-Frechette, "Mortgaging the Future: Dumping Ethics with Nuclear Waste," *Science and Engineering Ethics*, November 2005.

⁴ EPA, *Health Risks: Exposure to Radon Causes Lung Cancer In Non-smokers and Smokers Alike*, <http://www.epa.gov/iaq/tradon/healthrisks.html>.

⁵ "Assessment of Variations in Radiation Exposure in the United States," Contract Number EP-D-05-002 Work Assignment No. 1-03, Prepared for: U.S. Environmental Protection Agency, July 15, 2005, Table 1, page 4.

proportionately higher risks. Under these standards, significant numbers of people could legally be exposed to doses that would produce a statistical 100% chance of inducing a cancer in the exposed individuals.

Incredibly, EPA is proposing to arbitrarily abandon its groundwater protection standard after 10,000 years—at the point when the when the groundwater will become increasingly contaminated, according to DOE’s models. EPA has concluded that groundwater is the most likely pathway to lead to human exposure to radiation from the Yucca Mountain. When the Nuclear Energy Institute challenged EPA’s authority to set separate groundwater standards, the court upheld EPA’s right, agreeing that “EPA has offered an entirely rational reason for protecting water resources while they remain underground: *Preventing* ground water contamination is more cost-effective and environmentally protective, and applying [drinking water] standards will encourage a robust containment and isolation design.”⁶ EPA itself wrote in its Final Rule for its first radiation standard:

We believe that there is no question that separate ground water protection standards are appropriate for deep geologic disposal facilities. We believe that the use of contaminated ground water for purposes that could result in exposures to individuals should be of concern, and that avoiding contaminating useable ground water resources is in the general interest of the public at large.⁷

Apparently, this only applies to members of the public within 10,000 years. EPA has declared that since it is not modifying the groundwater standard that it does not have to consider public comment on this vital aspect of the proposed regulation. Simply because the court decision allows EPA to set groundwater standards does not mean that the agency is exempt from considering public comment on its decision to not extend the groundwater standard to 1 million years. The groundwater standard is integral to the protectiveness of the overall radiation standard. EPA should extend the groundwater standard to 1 million years and must take into consideration all public comments on this issue.

Finally, but most importantly, this proposed standard is immoral. **It has long been resolved—both in the United States and internationally—that it is unethical to expose future generations to much higher levels of radiation than current generations.**

EPA stated as much in its Final Rule for its first radiation standard for Yucca Mountain:

A guiding philosophy in radioactive waste management, as well as waste disposal in general, has been to avoid imposing burdens on future generations for cleanup efforts as a result of disposal approaches that would knowingly result in pollution in the future. With respect to radioactive waste disposal, we believe the fundamental principle of

⁶ Nuclear Energy Institute, Inc. v. Environmental Protection Agency, United States Court of Appeals for the District of Columbia Circuit, Decided July 9, 2004, page 50.

⁷ 40 CFR Part 197, Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV Final Rule - Federal Register / Vol. 66, No. 114 / Wednesday, June 13, 2001, page 36 of pdf.

intergenerational equity is important. We should not knowingly impose burdens on future generations that we ourselves are not willing to assume.⁸

Yet, EPA's proposed rule blatantly tramples on the principle of intergenerational equity. Kristin Shrader-Frechette stated the moral issue clearly in her recent article called "Mortgaging the Future: Dumping Ethics with Nuclear Waste" in *Science and Engineering Ethics*, "E.P.A.'s double radiation standards for different generations...suggest that we merit more protection than our descendants. Yet we, not they, profit from nuclear power plants that produce the radioactive waste."⁹

The Energy Policy Act of 1992 requires EPA to set "public health and safety standards for protection of the public from releases from radioactive materials...at the Yucca Mountain site." This draft rule utterly and completely fails in that legal and moral duty.

⁸ *Ibid.*, page 35 of pdf.

⁹ Kristin Shrader-Frechette, "Mortgaging the Future: Dumping Ethics with Nuclear Waste," *Science and Engineering Ethics*, November 2005.