



Texas Radiation Advisory Board

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September 19, 2000

The Honorable George W. Bush
Governor of Texas
P.O. Box 12428
Austin, Texas 78711

Dear Governor Bush:

I understand you recently received a letter from the Environmental Protection Agency (EPA) advising you of a revision to the Safe Drinking Water Act regarding radon. The Texas Radiation Advisory Board (TRAB) believes that EPA's revised drinking water rules for radon will impose \$400 million in costs on the nation, \$40 million of which will likely fall on Texas -- predominantly on small water systems that can ill-afford the additional burden.

The TRAB's concerns are that the burdens placed on Texans by the changes in the EPA rules are unwarranted and unsupported by public health information. The public health hazard this rule presumes to address has never been scientifically demonstrated. I am enclosing an appendix explaining the technical factors the board considered.

The TRAB understands that community water system (CWS) funds are very limited; the TRAB believes that issues of water supply, infrastructure and basic hygiene should take precedence over radon mitigation. These critical CWS funds should not be exhausted on the mitigation of a hypothetical risk of radon in water, but instead on the mitigation of water-borne pathogens that are causing real death and disease throughout the nation today. In the end, it is not a question of what is the most cost-effective alternative for Texans, but ultimately it is a question of "who pays" for the mitigation of a minuscule or non-existent risk.

As a matter of radiation and safe drinking water policy for the State of Texas, the TRAB recommends that the State of Texas consider challenging the EPA rules to be promulgated in August 2000. Because the Texas Natural Resource Conservation Commission is the agency charged with administering EPA rules, the TRAB will be advising the commissioners of its recommendation as well.

Please contact me if I may be of further assistance.

Sincerely,

original signed by

Dale E. Klein, Ph.D., P.E.
Chair

Enclosure

The Honorable George W. Bush
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cc:

Senator Judith Zaffirini
Representative Patricia Gray
Representative Elliott Naishtat
Representative Warren Chisum
Representative Don Young
Representative Bill Young
Senator J. E. "Buster" Brown
Senator Pete Domenici
Senator Kay Bailey Hutchison
Senator Phil Gramm
Senator Ted Stevens
Senator Bob Smith
William R. Archer, III. M.D.
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Richard Ratliff, P.E.
Alice Rogers, P.E.
Bob Beleckis
Tony Bennett
Pete Lyons
Joseph L. Fuller
Jeffrey A. Saitas, P.E.

Appendix: Technical Considerations **Revision to the Safe Drinking Water Act (SDWA) Rules Regarding Radon**

Background

The Environmental Protection Agency (EPA) states that the 1999 National Academy of Sciences (NAS) report¹ confirmed that radon in drinking water causes cancer deaths. In fact, it does not. What the NAS report does say, however, is that the risk from exposure to radon in water is exceedingly small – 0.02% to 0.17% of all lung cancers and 0.01% to 0.36% of all stomach cancers might be attributable to radon in water.² Limited funds should not be invested in the mitigation of a hypothetical risk of radon in water. Technical considerations which lead to this conclusion address:

- risk evaluation
- related health studies
- relationship between radon exposure and lung cancer risk
- cost effectiveness of compliance options

Risk Evaluation

Two issues in particular complicate the risk statement made by EPA:

1. There is no epidemiological data that has ever linked radon exposure to stomach cancer. The radon-stomach cancer relationship is an unproven hypothesis, and the stated “risk” a calculated conjecture.
2. Lung cancer “risks” are based on uranium miners studies that establish a cause and effect relationship for radon and lung cancer at very high exposures only for smokers and only if all other mine-related exposures are ignored (silicates (dust), diesel exhaust fumes, etc.). A downward extrapolation to radon exposures in the home (hundreds to thousands of times lower concentrations than in mines) is accomplished by another hypothesis -- the Linear No-Threshold Hypothesis (LNTH).³

Dr. Paul Rowher, president of the Health Physics Society (HPS) recently addressed a congressional subcommittee on the reexamination of the scientific basis for the LNTH and commented on the expenditure of large sums of money with no known public health benefit: “The mis-use of a LNT model can result in the mis-appropriation of public money with a net harm to public health.”⁴ It is the position of the HPS that the LNTH is misused in both legislation and regulations. Dr. Rowher went on to say that “the Society does not endorse the quantification of health effects from minute doses of radiation, or the presumption of causation of disease by any amount of radiation. We consider this a mis-use of the LNT model.”

¹“Risk Assessment of Radon in Drinking Water,” Committee on Risk Assessment of Exposure to Radon in Drinking Water, Board on Radiation Effects Research, Commission on Life Sciences, National Research Council, 1999.

² Ranges “subjectively determined” within the NAS report cited above.

³ LNTH can be characterized by the following analogy: if a person taking 100 aspirin tablets constitutes a lethal dose (or 100 person-aspirins = 1 death) then giving 100 people 1 aspirin each would create the same collective dose (100 person-aspirins) and result in the death of 1 hypothetical person.

⁴ Testimony of Paul S. Rohwer, PhD., CHP, President, Health Physics Society, Hearing on “Reexamining the Scientific Basis for the Linear No-Threshold Model of Low-dose Radiation,” before the House Science Subcommittee on Energy and Environment, 18 July 2000.

Related Health Studies

In promulgating the changes to the SDWA rules, EPA does not acknowledge two additional and significant issues found in radon health studies:

1. Ten of the 12 household studies looking for a radon-lung cancer connection have *failed* to find a positive association. Of the two that have found positive associations, the latest study -- the Iowa Radon Lung Cancer Study⁵ published in May of this year -- was only able to establish "statistical significance" by omitting cases that died during the study period, carving up the data set into non-uniform intervals, and poorly correcting for disparities in smoking histories between subjects and controls. In fact, a radon-lung cancer connection has never been conclusively established for non-smokers, neither in the home nor in the mine.⁶
2. A wide-ranging report published by the Government Accounting Office in June of this year evaluated a total of 67 cancer studies that also included environments other than the home.⁷ Out of that number of studies, 33% reported results indicating a statistically significant correlation between natural background radiation or radon and cancer rates, while 67% found no such correlation -- including 12% that found a negative correlation (or radon exposures are *beneficial*).

Relationship between Radon Exposure and Lung Cancer Risk

An NAS report that the EPA uses to construct the hypothetical radon deaths reported in the agency's literature concludes by stating, "[T]he committee's model may not correctly specify the true relationship between radon exposure and lung cancer risk. The models assume a linear-multiplicative relationship without threshold between radon exposure and risk. While the miner data provide evidence of linearity across the range of exposures received in the mines, the assumption of linearity down to the lowest exposures was based on mechanistic considerations that could not be validated against observational data. [Emphasis added]"⁸

Cost Effectiveness of Compliance Options

Since the EPA issued its first "radon warning" in 1980, Americans have spent over \$1 trillion on a public health hazard that has never been scientifically demonstrated to exist. The soon-to-be promulgated drinking water rules will impose another \$400 million in costs on the nation, \$40 million of which will likely fall on Texas -- predominantly on small water systems that can ill-afford the additional burden.

⁵ Field, W. R., *et al.*, "Residential Radon Gas Exposure and Lung Cancer: The Iowa Radon Lung Cancer Study," American Journal of Epidemiology, Vol. 151; No. 11, May, 2000.

⁶For over 40 years Dr. Gino Saccomanno has studied uranium miner disease at St. Mary's Hospital in Grand Junction, Colorado. He has yet to find a *single case* of lung cancer among non-smoking uranium miners who breathe in radon eight hours a day, five days a week at levels much greater than households.

⁷ GAO/RCED-00-152, "Report to the Honorable Pete Domenici, U.S.; Senate: Radiation Standards: Scientific Basis Inconclusive, and EPA and NRC Disagreement Continues," June 2000.

⁸The Health Effects of Exposure to Indoor Radon, BEIR VI, Committee on Health Risks of Exposure to Radon (BEIR VI), Board on Radiation Effects Research, Commission on Life Sciences, National Research Council, 1999.

EPA's new rules provide the option of complying with a Maximum Contaminant Level (MCL) of 300 pCi/L of radon dissolved in water or with an Alternative Maximum Contaminant Level (AMCL) of 4,000 pCi/L while adopting state-wide or local Multimedia Mitigation (MMM) programs to reduce indoor radon concentrations. EPA encourages the adoption of the AMCL/MMM approach as the most cost-effective alternative.⁹

Upon closer inspection, the cost-effectiveness of the EPA-preferred approach shows several complications:

1. For those community water systems failing to meet either the MCL or AMCL, filtering out radon and its byproducts will create radioactive wastes that will require special handling and disposal by trained personnel.
2. Radiation exposures from the radioactive wastes created by filtration will concentrate an otherwise diffuse and minuscule hazard on a very few individuals employed by the water system, possibly requiring additional costs to monitor and mitigate the hazards.
3. If you do not choose to adopt the MMM at the state level, the state is still required to maintain oversight and verify that communities adopting the MMM approach are meeting the requirements of the rule. This would be an entirely new program for Texas for which agency jurisdiction is unknown.
4. Construction techniques for new homes have not been shown to be effective in consistently reducing radon levels – some have even been shown to increase exposures.
5. Homeowners may not be willing to cooperate with state agencies or water systems that have set up a radon testing, inspection and remediation program, especially if the results of the testing require the individual homeowner to spend thousands of dollars reducing radon levels in their homes to the EPA target levels. Hence, it may be impossible to implement a MMM program if Texans feel that they will be singled out and adversely impacted.

In the end, it is not a question of what is the most cost-effective alternative for Texans, but ultimately it is a question of “who pays” for the mitigation of a minuscule or non-existent risk.

Most interesting in the entire discussion is the question of whether the EPA – regardless of the lack of scientific and public health basis for the radon rule – is overstepping its authority granted in the SDWA by writing rules that govern the control of radon in water AND indoor air. Clearly, the SDWA does not address indoor air quality.

Conclusion

In balancing the risks that Texans face on a daily basis, other risks pose far greater consequences. For instance, the total lung cancer incidence could be reduced by devoting more attention to smoking cessation programs and less attention to radon. Smokers have always faced a much higher risk for lung cancer; that increased risk is further magnified by high radon exposures. By reducing the number of smokers, the hypothetical risk of radon-induced lung cancer is also reduced.

The limited funds possessed by CWSs for maintaining the safety and integrity of their water supplies should not be exhausted on the mitigation of a hypothetical risk for radon in water. Beyond those monies needed to meet the basic water needs of the community, any additional expenditures should be focused on the mitigation of water-borne pathogens that are causing real death and disease throughout the nation today.

⁹ The rules would apply only to community water systems that regularly serve 25 or more people and that use ground water or mixed ground water and surface water (e.g., systems serving homes, apartments and trailer parks).