

**TESTIMONY OF JEFFREY R HOLMSTEAD
ON BEHALF OF
THE ENVIRONMENTAL PROTECTION AGENCY**

**BEFORE THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
U.S. SENATE**

MAY 23, 2002

Mr. Chairman and Members of the Committee:

Good morning. My name is Jeffrey Holmstead and I currently serve as the Assistant Administrator for Air and Radiation at the U.S. Environmental Protection Agency (EPA). I am pleased to be here today to discuss EPA's role in setting public health and environmental radiation protection standards for the proposed spent nuclear fuel and high-level radioactive waste repository at Yucca Mountain, Nevada. I appreciate this opportunity to discuss EPA's responsibilities related to this important national project.

INTRODUCTION

EPA's roles and responsibilities in the federal government's establishment of a repository for spent nuclear fuel and high-level radioactive waste are described generally in the Nuclear Waste Policy Act, and more specifically for the Yucca Mountain site in the Energy Policy Act of 1992. These statutes assign EPA the task of developing public health and environmental radiation protection standards for the repository. These same statutes assign other roles and responsibilities to other governmental entities. The Department of Energy (DOE) has the responsibility to determine whether the site is suitable for a repository; The Nuclear Regulatory Commission (NRC) has the responsibility to review DOE's application for a license for the repository; and Congress has the responsibility for final approval or denial of DOE's suitability recommendation. EPA issued its final standards for the Yucca Mountain repository on June 13, 2001 (40 CFR 197). These standards were developed through extensive consultation with DOE, NRC, the Office of Science and Technology Policy, and were the subject of significant public comment. DOE must address these standards in its license application. NRC may issue a license only if it determines that DOE demonstrates a reasonable expectation that the repository will comply with all provisions of the EPA standards. EPA believes that disposal in compliance with the EPA standards will be fully protective of public health and the environment. In fact, EPA's standards are both implementable and among the most stringent in the world.

NAS REPORT

The Energy Policy Act of 1992 also directed EPA to contract with the National Academy of Sciences to provide findings and recommendations on reasonable public health and safety standards for establishing a repository for spent nuclear fuel and high-level

radioactive waste. NAS issued its report in 1995. I will refer to the NAS report as I discuss the EPA standards further. NAS has provided formal comments to EPA stating that our standards for Yucca Mountain are generally consistent with the NAS recommendations.

OVERVIEW OF EPA STANDARDS

Under EPA's standards, DOE must demonstrate a reasonable expectation of compliance with three separate provisions: an individual-protection standard, a human intrusion standard, and standards that are specifically intended to protect ground water as a natural resource.

The Individual Protection Standard is the core element of EPA's regulation. It is the most basic measure of how well the repository will operate. To meet this standard, DOE must demonstrate a reasonable expectation that the "Reasonably Maximally Exposed Individual," or RMEI, will not incur an annual dose of radiation above 15 millirem, from all exposure pathways combined. The RMEI is a typical individual whose location and lifestyle would place him among the most highly, but not necessarily the highest, exposed members of the population. (Although NAS recommended using a "critical group" approach, it agreed that EPA's approach was "broadly consistent" with its recommendation.) EPA's view is that, by meeting the standard for the RMEI, public health and safety, including the health and safety of those living in the immediate vicinity of Yucca Mountain, will be protected now and for future generations. This approach is preferable to postulating unrealistic scenarios to protect hypothetical individuals for whom lifestyles could be constructed that might lead to unusually high exposures, and thus is consistent with the NAS recommendation to use "cautious, but reasonable" assumptions.

The Human Intrusion Standard accounts for the possibility that future human activity could compromise the integrity of the repository and cause releases of radioactive material. NAS found that there is no credible means of predicting whether, when, or how often such an intrusion might occur at Yucca Mountain, so analyzing a simple event to determine how well the repository responds would be appropriate. In accordance with the NAS recommendation, EPA's Human Intrusion Standards requires DOE to meet the same RMEI standard as in the individual-protection analysis.

EPA adopted separate ground-water protection standards because it is long-standing Agency policy to protect ground water as a natural resource, especially when that resource is a source of drinking water. EPA believes that ground water should be protected to ensure that the Nation's drinking water resources do not present adverse health risks and are preserved for present and future generations. This is particularly important in arid regions, such as southern Nevada, where ground water is precious, and cleaning up the aquifer would be challenging and costly. Therefore, EPA's standards require DOE to demonstrate that ground water will not be radioactively contaminated above certain standards, which are consistent with EPA's radiation standards for drinking water.

To determine the location where the three basic provisions of EPA's disposal standards must be met, EPA's standards set the point of compliance south of the repository at the Nevada Test Site boundary, about 18 kilometers (11 miles) from the repository. EPA used regional ground water flow patterns, current population patterns, and near-term local plans, to identify this location and to calculate potential exposure scenarios. EPA's standards apply at the location outside this boundary where radionuclide concentrations in ground water could be highest.

DOE must demonstrate compliance with each of these provisions for a period of not less than 10,000 years after disposal. In addition, EPA's standard requires that DOE include analyses showing the performance of the repository after 10,000 years in its Environmental Impact Statement, so that the public will have the full record before it.

Finally, although DOE must demonstrate compliance with these standards to the NRC, EPA recognizes that absolute proof in the conventional sense will be impossible to attain for analyses extending ten thousand years into the future. Therefore, EPA requires that DOE demonstrate a "reasonable expectation" that the standards will be met. This standard should not be construed as requiring a less rigorous or scientific process. It is simply a recognition that there will inevitably be significant uncertainties in projecting the performance of natural and engineered systems over very long time periods, and that these uncertainties must be understood and managed accordingly.

EPA'S ROLE NOW THAT THE STANDARD IS COMPLETE

Although EPA's statutory role was complete with the issuance of its final standards, it continues to be involved in many of the ongoing activities of other agencies. First, EPA is defending its standard in court against challenges brought by several parties. EPA has also reviewed and provided comment on NRC's licensing requirements for the Yucca Mountain repository, DOE's site evaluation guidelines, and DOE's Draft, Supplemental, and Final Environmental Impact Statements. EPA is currently reviewing NRC's draft Yucca Mountain Review Plan, and plans to comment as appropriate. EPA also expects to review DOE's evolving plans for transportation, though the selection of transportation modes and routes is DOE's responsibility. Finally, EPA continues to receive and respond to questions from the public, not only on EPA's standards, but on the other repository-related activities listed above.

Thank you again for the opportunity to appear today before the Subcommittee to present the EPA's views. This concludes my prepared statement. I would be happy to address any questions that you may have.