

# THE NATIONAL ACADEMIES

*Advisers to the Nation on Science, Engineering, and Medicine*



Board on Radioactive Waste Management

500 Fifth Street, NW  
6<sup>th</sup> Floor  
Washington, DC 20001  
Phone: 202 334 3066  
Fax: 202 334 3077

September 12, 2003

The Honorable John Heaton  
State of New Mexico House of Representatives  
102 South Canyon  
Carlsbad, New Mexico 88220



Dear Representative Heaton:

President Bruce Alberts has asked me to respond to your August 25, 2003 letter requesting the information I provided to Senator Jeff Bingaman on previous National Academies reports on the Waste Isolation Pilot Plant (WIPP). I know that these reports are of great interest to you and other New Mexico citizens, so I am pleased to have an opportunity to provide this information.

I was asked by Senator Bingaman's staff whether I agreed with the characterization of previous National Academies WIPP reports that was contained in the Senate Energy Committee language accompanying Section 310 of Senate Bill 1424: "Both the New Mexico Environmental Evaluation Group, an independent WIPP oversight group, and the National Academy of Sciences have strongly suggested that waste destined for disposal at WIPP should not undergo hazardous waste sampling and analysis." I responded that I believed this language over-generalized the conclusions from our previous reports and was subject to misinterpretation. I was particularly concerned that the language could be interpreted to suggest that the National Academies believe that no information about hazardous waste characteristics is needed to send transuranic waste to WIPP for disposal. As discussed below, this clearly is not the case.

I told Senator Bingaman's staff that the Senate Energy Committee's report language would have been more accurate had it explicitly mentioned the following: (1) the hazardous waste sampling and analysis procedures addressed by our reports, and (2) the need for the information obtained from those procedures given currently available knowledge of waste characteristics. To the extent that good-quality "acceptable knowledge" (i.e., knowledge of the physical, chemical, and radiological characteristics of the waste based on historical information) is available, the need for additional confirmatory measurements can be reduced or eliminated. For example, language such as "... the National Academies have strongly suggested that waste destined for disposal at WIPP should not undergo headspace gas and homogeneous solids sampling and analyses to confirm information that is already available using acceptable knowledge" would, I believe, have been a more accurate inference.



I also commented that the Section 310 language itself was potentially misleading because it suggested that ignitable, corrosive, or reactive waste could be detected using radiography, which is not correct from a technical standpoint. I pointed out that radiography could, in principle, be used to confirm the accuracy of the Department of Energy's knowledge of waste characteristics. This, in turn, could be used as indirect confirmation that the waste contained no ignitable, corrosive, or reactive materials. Radiography cannot, however, be used to detect these waste properties directly.

I want to emphasize that the National Academies take no position on the Section 310 legislation. Our role is to provide scientific and technical analyses and advice when called upon by government. Our reports on the WIPP were produced at the request of the Department of Energy as part of its efforts to improve the transuranic waste characterization program. Because these reports are being used as a basis for federal legislation that would change WIPP's waste characterization requirements, I believe that it is important to understand precisely what they recommended, rather than drawing inferences.

The National Academies have produced four reports to date on the Department of Energy's transuranic waste characterization program:

1. Improving Operations and Long-Term Safety of the Waste Isolation Pilot Plant: Interim Report (2000). [Available online at <http://www.nap.edu/catalog/9842.html>.]
2. Improving Operations and Long-Term Safety of the Waste Isolation Pilot Plant: Final Report (2001). [<http://www.nap.edu/catalog/10143.html>]
3. Characterization of Remote-Handled Transuranic Waste for the Waste Isolation Pilot Plant: Interim Report (2001). [<http://www.nap.edu/catalog/10244.html>]
4. Characterization of Remote-Handled Transuranic Waste for the Waste Isolation Pilot Plant: Final Report (2002). [<http://www.nap.edu/catalog/10492.html>]

Another National Academies study of the Department of Energy's characterization program for contact-handled transuranic waste is now underway. The final report from this study will be issued around the end of 2003.

The 2000 interim report (#1 above) and the 2002 final report (#4 above) are most directly relevant to the Section 310 legislation. The 2000 interim report, which focused on six waste characterization requirements for contact-handled transuranic waste, made the following recommendation (p. 14): "DOE [Department of Energy] should eliminate self-imposed waste characterization requirements that lack a legal or safety basis" (emphasis added). The 2002 final report, which reviewed the Department of Energy's draft plans for characterization of remote-handled transuranic waste, made a similar recommendation (p. 49): " ... DOE should propose only characterization activities that have a technical, health and safety, or regulatory basis" (again, emphasis added).

The characterization requirements addressed by the recommendation in the 2000 interim report were "self imposed" in the sense that they were first suggested by

the Department of Energy and incorporated into WIPP's RCRA (Resource Conservation and Recovery Act) permit by the New Mexico Environment Department. Because these requirements are part of the permit, the Department of Energy cannot eliminate them unilaterally. Indeed, the 2000 interim report's authoring committee understood that the Department of Energy would need to make sound legal and safety arguments to its regulator if it wanted to eliminate these characterization requirements from the permit—it is unlikely that the regulator would agree to such elimination solely on the basis of a National Academies report. To the extent that the Section 310 legislation relieves the Department of Energy of the responsibility to make such arguments, it provides a different route for eliminating procedures than was contemplated by the 2000 interim report's authoring committee.

The 2000 interim report found no technical or legal foundation for the homogeneous solids, headspace gas sampling and analysis, and visual examination procedures for contact-handled transuranic waste based on information provided by the Department of Energy. I believe it is reasonable to conclude that this report supports the removal of these requirements through the normal permit modification process. In the context of the Section 310 legislation, however, it is also important to recognize that this report did not explicitly recommend the outright elimination of these procedures.

The 2000 interim report also examined the requirement for real-time radiography, which is currently being performed on most containers of contact-handled transuranic waste destined for disposal in WIPP. The report did not question the technical or legal foundation for this procedure. The report also made no recommendations concerning the application of this procedure to a statistical sample of waste as mandated by the Section 310 legislation. In fact, the 2000 interim report provides no advice on reducing or eliminating real-time radiography to confirm knowledge of waste characteristics for contact-handled transuranic waste.

The 2002 final report on remote-handled transuranic waste pointed out (p. 48) that, according to the Department of Energy, "95 percent of the RH-TRU [remote-handled transuranic] waste to be disposed of in WIPP has yet to be generated or needs to be processed, packaged, or repackaged." Processing and packaging or repackaging of this waste would result in essentially 100 percent visual examination. Consequently, the report noted (p. 48) that additional confirmatory measurements would be unnecessary if such processing and packaging operations were carried out under a certified quality assurance program. The report also noted (p. 49) that for the remaining 5% of the waste, acceptable knowledge might require additional confirmation activities. I should point out that remote-handled transuranic waste constitutes only between about 2 and 4 percent of the total WIPP waste inventory according to the Department of Energy's current estimates.

The National Academies study that is now underway will provide the Department of Energy with a framework for evaluating the utility of information gained from its characterization activities for contact-handled transuranic waste, including the activities

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addressed by the Section 310 legislation. This framework will consider the impact of characterization data on safety, regulatory compliance, and costs in light of experience gained since operations began at WIPP. I would be pleased to arrange a briefing for you on this report once it is approved for public release.

In the meantime, I would be happy to provide copies of our WIPP reports to any interested party so they can read the language for themselves and make their own judgments of its meaning. Copies of these reports can be obtained by contacting the National Academies Board on Radioactive Waste Management at 202-344-3066 (or [brwm@nas.edu](mailto:brwm@nas.edu)). These reports also can be read on-line at the web addresses provided with the report citations elsewhere in this letter.

Again, I appreciate the opportunity to share these comments. I hope they provide the information you requested.

Sincerely yours,

/original signed by Kevin Crowley/

Kevin Crowley  
Director  
Board on Radioactive Waste Management

- cc. Members, Board on Radioactive Waste Management  
Members, Committee on the Optimization of Characterization and Transportation  
of Transuranic Waste Destined for the Waste Isolation Pilot Plant  
Past Members, Committee on the Characterization of Remote-Handled  
Transuranic Waste for the Waste Isolation Pilot Plant  
Past Members, Committee on the Waste Isolation Pilot Plant