

**NRCREP - NUREG-1854 "Standard Review Plan for Activities Related to U.S. DOE Waste Determinations"**

**From:** "Dirk A Dunning" <Dirk.A.Dunning@state.or.us>  
**To:** <NRCREP@nrc.gov>  
**Date:** 07/31/2006 10:47 AM  
**Subject:** NUREG-1854 "Standard Review Plan for Activities Related to U.S. DOE Waste Determinations"  
**CC:** "Dirk A Dunning" <Dirk.A.Dunning@state.or.us>

*5/31/06*  
*71FR 30967*

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Ms. Bradford,

Please find attached an electronic copy of the State of Oregon's comments on NUREG-1854, "Standard Review Plan for Activities Related to U.S. Department of Energy Waste Determinations", June, 2006. We will also send a hard copy by U.S. Mail. If you have any questions about our comments, please feel free to contact me.

Dirk Dunning, P.E.  
Oregon Department of Energy  
Nuclear Safety and Energy Siting Division  
625 Marion St. NE  
Salem, Oregon 97301-3737

(503) 378-3187  
(503) 378-6457 (Fax)  
(800) 221-8035 (Oregon only 800#)  
(503) 378-4040 (Receptionist)

[Dirk.A.Dunning@state.or.us](mailto:Dirk.A.Dunning@state.or.us)

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*Auth = A. Bradford (A#01)*



# Oregon

Theodore R. Kulongoski, Governor



OREGON  
DEPARTMENT OF  
ENERGY

625 Marion St. NE  
Salem, OR 97301-3737  
Phone: (503) 378-4040  
Toll Free: 1-800-221-8035

July 31, 2006

[www.energy.state.or.us](http://www.energy.state.or.us)

Ms. Anna Bradford  
Chief, Rules Review and Directives Branch  
Mail Stop T6-D59  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Re: Draft Standard Review Plan for DOE Waste Determinations, May 2006.  
& Docket Numbers PROJ0734, PROJ0735, PROJ0736, and POOM-32

Dear Ms. Bradford:

The State of Oregon appreciates the opportunity to comment on the Draft Standard Review Plan for DOE Waste Determinations. Oregon has long-standing interests and concerns related to the final disposition of high-level waste at the Hanford Site in Washington state.

As noted in the "Introduction," Oregon previously commented on the Draft Interim Concentration Averaging Guidance for Waste Determinations. That letter conveyed our concerns about using waste concentration averaging to allow near-surface disposal of wastes that would otherwise require deep-geologic disposal.

We are concerned that while this new document acknowledges receipt of our comments, those comments have not yet been adjudicated or incorporated into this draft. Therefore, we believe it necessary to summarize our previous comments and request that the NRC reopen the document for review once NRC does address these and other comments.

#### Summary of Oregon Comments Submitted January 31, 2006

- This document wrongly asserts the application of the 2005 National Defense Authorization Act (NDAA) at Hanford, despite it specifically not applying to Hanford.
- The proposed rules fail to meet the mandate for removal of radionuclides from the waste to the maximum extent practicable. They instead rely on removing the bulk of the radionuclides by retrieving the bulk of the waste, while not removing the radionuclides

fail to recognize these heals and liquid wastes do not readily mix with grout (reducing or otherwise).

- The proposed rules average the volume of mixed grout and stabilizing materials with the residual wastes to reduce waste concentrations below regulatory standards, while specifically directing that such averaging not be used in the performance assessments. If the appropriate standard for the performance assessment does not allow such averaging, neither should the standard for determining whether the waste is allowed in near-surface disposal.
- The proposed rules are constructed on the basis that performance assessments can adequately calculate the risk from the residual wastes; that caps, covers, or other barriers will perform as designed for periods vastly longer than human experience; and that institutional controls will be maintained in perpetuity. Each of these assumptions is flawed.
- At Hanford and arid sites across the west, hydrogeologic investigations demonstrate that no existing mathematical model adequately predicts the movement of contaminants through the vadose zone soils or through the groundwater. The complex layered geology under the Hanford Site causes preferential flow of water and waste through the soil – bypassing the vast majority of the soil column. This preferential flow is often dominated by horizontal flow in thin layers on old surfaces, by direct vertical flow on dikes, down channels and along pipes, and through fractures in basalt. The performance assessments do not consider this preferential flow. The caps, covers and barriers proposed pre-suppose that water gets to the waste by traveling directly downward from the surface. Layered and structured soils may make this assumption invalid. Without specific vertical cutoff barriers to intercept the lateral flow of water in the soil, the caps and barriers may serve little purpose in such cases.
- The major radioactive waste hazards at Hanford are from elements (uranium, technetium, iodine, neptunium, americium, selenium, cobalt) that form anions in the soil. The soils at these sites do not easily retain anions.
- DOE also currently proposes use of evapotranspiration barriers. At Hanford, the bulk of the precipitation occurs when the plants are least able to take up water. Hanford is also subject to periodic large scale range fires that remove the entire plant canopy, greatly reducing the ability of the caps and barriers to function for a decade or more.
- We have seen little evidence that waste site institutional controls can be maintained for periods even approaching 100 years. The rules should not assume these controls would remain in place absent physical means to assure that they do.

### **Additional Comments**

Section four of the review plan does a good job of

- Calling out the need for alternate conceptual models.

- Ensuring that only models that actually represent the real conditions are used.
- Using realistic parameters in those models that adequately emulate or bound the observed actual behavior of the site.
- Understanding and applying the limitations on the use of kd's in models. At Hanford the actual movement of waste is often at odds with the movement that would be predicted by kd-based models. As one example, Cobalt 60 is presumed to have a kd of 1,500, making it extremely immobile. In reality, it is observed deep in Hanford soils and is highly mobile.
- Mandating the assessment of the likelihood of colloid formation. Hanford-specific studies performed as part of the Environmental Management Science Program in the late 1990s demonstrated that when the highly caustic Hanford tank waste comes into contact with Hanford soils, it both destroys the silicate soil matrix, and forms immense quantities of fine colloids that do bind radionuclides from the waste, making them mobile in the subsurface.

NRC staff will need to be diligent in their review applying these criteria to DOE proposals. The conceptual and numerical models used in the performance and other risk assessments and Environmental Impact Statements performed at Hanford to date do not meet these standards.

Other requirements, laws and regulations

The standards document directs staff to evaluate or assess the technical and financial practicability of DOE's plans. The standard, however, does not include the full range of costs, or other requirements, including but not limited to:

- Protection of groundwater for best beneficial use under State and Federal law
- Prevention of the spread of contamination
- Evaluation of natural resource damage costs,
- Compliance with State laws,
- Compliance with Federal laws such as CERCLA, and
- Tribal treaty rights

The costs of the damage to groundwater alone may be immense due to the high mobility of uranium and technetium in Hanford soils. The technical and financial impracticability must be weighed not just for the proposed action, but also for the proposed inaction.

If you have questions or require clarification of these comments, please contact Dirk Dunning of my staff at (503) 378-3187, or myself at (503) 378-4906.

Sincerely,



Ken Niles  
Assistant Director

CC: Roy Schepens, U.S. Department of Energy, Office of River Protection  
Nick Ceto, U.S. Environmental Protection Agency, Region 10  
Jane Hedges, Washington Department of Ecology  
Stuart Harris, Confederated Tribes of the Umatilla Indian Reservation  
Gabe Bohnee, Nez Perce Tribe  
Russell Jim, Yakama Nation

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Subject: NUREG 1854 "Standard Review Plan for Activities Related to US DOE

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From: "Dirk A Dunning" <Dirk.A.Dunning@state.or.us>

Created By: Dirk.A.Dunning@state.or.us

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