



## Department of Energy

Washington, DC 20585

June 28, 2012

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Deputy Director  
Mail Stop T8F5  
Washington, DC 20555-0001

Subject: Groundwater Assessment Plan for the Shirley Basin South, Wyoming, UMTRCA  
Title II Disposal Site

### References:

(1) Letter from U.S. Nuclear Regulatory Commission to the U.S. Department of Energy, February 27, 2012, "U.S. Nuclear Regulatory Commission Staff Review of U.S. Department of Energy Request to Revise Alternate Concentration Limits at the Shirley Basin South, Wyoming, Uranium Mill Tailings Radiation Control Act Site, Dated June 2011."

(2) Letter from the U.S. Department of Energy to the Nuclear Regulatory Commission, September 29, 2011, "Actions Related to the Shirley Basin South, Wyoming, UMTRCA Title II disposal Site."

### To Whom It May Concern:

This letter is in response to a letter from Mr. Dominick Orlando dated February 27, 2012. As requested in the referenced letter and as discussed with U.S. Nuclear Regulatory Commission (NRC) and Wyoming Department of Environmental Quality (WDEQ) staff by conference call on February 1, 2012, the U.S. Department of Energy (DOE) withdraws its request to modify the monitoring program at the Shirley Basin South site at this time. DOE will continue to monitor the constituents required by the site Long-Term Surveillance Plan (LTSP) for the expanded monitoring well network until changes to the monitoring program receive NRC concurrence.

Also as requested in the referenced letter, DOE recommends the following plan to assess site groundwater based on information from our current sampling program and from past sampling programs.

1. Evaluate the conceptual model for the site developed by the former licensee [i.e., the model described in alternate concentration limit (ACL) application and the licensee's response to NRC comments to that application], and develop an assessment of the attenuation of the constituents of concern at the site. This assessment would include the following evaluations:
  - Determine if the relationships among pH, sulfate, radium-226, radium-228 and other pertinent constituents of concern (COCs) identified in ACL application continue to hold true.

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- Compare the predictions for sulfate and uranium concentrations at the point of compliance (POC) and point of exposure (POE) locations with observed results.
  - Compare the predictions for aquifer recovery and groundwater flow direction with observed results.
  - Address the natural variability of the hydrogeologic system, including the role of mineralization in affecting the behavior of certain COCs.
  - Reevaluate attenuation capacity of the hydrogeologic system and determine if the assumptions and conclusions in the ACL application are still valid.
2. Assess the potential risk from the COCs.
- Review the basis for predicted POE concentrations, taking into consideration the results from Item 1 above.
  - Identify likely exposure scenarios as described in the ACL application and based on current observations. Evaluate if the site boundary is a realistic POE.
  - Compare risk-based values of the COCs for most likely exposure scenarios (e.g., livestock watering) with their estimated POE concentrations.
3. Reevaluate the ACLs based on the results of the above assessment and recommend a revision to the monitoring program if appropriate.
- Account for post-corrective action rebound of the aquifers and the natural variability of the hydrogeologic system.
  - Use appropriate statistical measures for determining ACLs.
  - Consider the purpose of the ACLs regarding disposal cell performance and POE concentrations, and the potential risk associated with the exceedance of ACLs.

DOE will begin conducting the assessment if this plan is acceptable to NRC. Please call me at (720) 377-9682 if you have any questions. Please send any correspondence to:

U.S. Department of Energy  
Office of Legacy Management  
2597 Legacy Way  
Grand Junction, CO 81503

Sincerely,



Scott R. Surovchak  
Site Manager

Scott R. Surovchak  
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cc:

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