UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 28, 2018

Mr. Scott T. Anderson, Director
Division of Waste Management
and Radiation Control
Department of Environmental Quality
195 North 2950 West
Salt Lake City, UT 84116

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION SECY-08-0147 INTERPRETATION

Dear Mr. Anderson:

This letter is in reply to your letter of September 13, 2018, where you requested guidance from the U.S. Nuclear Regulatory Commission (NRC) regarding the NRC's "Response to Commission Order CLI-05-20 Regarding Depleted Uranium," designated as SECY-08-0147 (Agencywide Documents Access and Management System Accession No. ML081820814). Your letter referenced the recommendation in SECY-08-0147 that a site-specific performance assessment should be conducted to evaluate proposed disposal of significant quantities of depleted uranium (DU) and asked whether that recommendation applied to forms of DU other than DU oxides, which was the form of DU assumed in the analysis supporting SECY-08-0147. You noted, in your letter, metallic DU penetrators (i.e., ammunition) as an example of one potential alternative form of DU.

During a follow-up call with you and your staff on September 20, 2018, you clarified that your specific concern was whether the NRC's analytical framework was applicable only to DU oxides or to other forms of DU as well. The answer to that question is that this framework can be applied to all chemical forms of DU. During that phone call, you also indicated that, in one case under consideration, the material quantity for disposal would be above 10 metric tons.

As described in SECY-08-0147, the quantity of DU proposed for disposal is a critical factor in developing a sufficient analysis under 10 CFR 61.13. SECY-08-0147 characterizes 1 to 10 metric tons of DU as "small quantities" that could be suitable for shallow disposal. The SECY paper also describes "large quantities" of DU as "quantities similar to those being generated at uranium enrichment facilities," and provides that a site-specific analysis can determine whether specific disposal conditions will ensure the safe disposal of those quantities, consistent with 10 CFR 61.13 and Part 61, Subpart C. For example, the analysis underlying SECY-08-0147 considered the disposal of 1.4 million metric tons of DU.

The site-specific performance assessment described in SECY-08-0147 was based on an analysis of DU oxides because that is the form of DU that was considered most likely to be disposed of in significant quantities. However, the approach described in SECY-08-0147 to evaluate disposal of significant quantities of DU with a site-specific analysis was not limited to DU oxides.

SECY-08-0147 indicates that, for disposal under arid conditions, the most significant anticipated risk due to disposal of significant quantities of DU oxides results from exposure to radon gas. Therefore, for disposal at an arid site, factors affecting the flux of radon from the site, such as the depth of disposal, design of radon barriers, and radon emanation rate from the waste would impact disposal cell performance and potential dose. The rate of radon emanation from metallic DU, such as DU penetrators, is expected to be lower than the rate of radon emanation from DU oxides because of the lower porosity of metallic DU as compared to DU oxides. Whether the rate of radon emanation from metallic DU would be sufficiently lower than the rate of radon emanation from DU oxides, such that a site-specific analysis would not be necessary, would depend on other features of the site that affect potential exposure to radon gas, as well as the quantity of the DU being considered for disposal. Any consideration of the characteristics of the waste form would also be affected by alterations of the waste form during disposal. For example, metallic DU is susceptible to oxidation when in contact with atmospheric oxygen.

Alternative forms of DU could also have characteristics not directly considered in the technical analysis underlying SECY-08-0147. For example, pyrophoricity is a concern for finely-divided metallic DU and larger pieces (i.e., not finely-divided) DU at elevated temperatures. Similarly, hydrogen generation can be a concern for metallic DU in unvented storage in some circumstances. The NRC published draft final guidance on the conduct of technical analyses for low-level waste disposal facilities, NUREG-2175, in 2016 (available at ADAMS Accession No. ML14357A072).

If you have any additional questions, please contact either Stephen Dembek at 301-415-2342 or Dr. Christianne Ridge at 301-415-5673.

Sincerely,

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John R. Tappert, Director
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

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ADAMS Accession No.: ML18267A338 ***via email**

OFFICE	DUWP	DUWP	DUWP	DUWP	OGC	DUWP
NAME	PYadav for SDembek	CRidge	RChang	CMcKenney	AGendelman	JTappert
DATE	9/25/18*	9/25/18*	9/25/18	9/25/18	9/26/18*	9/28/18

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