

Comm - 026

Written Comments: Proposal Rule R313-25-8  
License Requirement for Land Disposal of  
Radioactive Waste Technical Analysis Depleted Uranium

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(Special note: I am requesting written response to these comments as regulations and statutes require).

**GENERAL COMMENTS:** Technical analysis needs to be transparent, scientifically defensible, peer reviewed like all scientific data, and proven without any reasonable doubt. The public must be allowed to review and comment on any performance analysis. Any consultants used must be independent of EngerySolutions and the State of Utah and this must be able to be confirmed by the public. The assumption of a ban on depleted uranium needs to be included. The 1,000 year limit is too short and needs to be at least a million years. Chemical properties other than radioactive isotopes must be analyzed. All daughter products must be analyzed. Methodology for threshold limits must be clearly defined. Uncertainties must be defined. Long and short-term effects addressed to human health and environment issues, as well as geological and climate changes issues, including freezing and thawing, but not limited to. There should be no exclusions of other animals that might be affected, and should be named. All assumptions must be analyzed as if it will occur. There needs to be a cost and benefit analysis for long and short-term risks. There needs to be a risk/benefit ratio analysis. Contingence and mediation analysis is needed. The deadline of March 1, 2010 needs to be removed, such that a proper and thorough analysis can be done. Analysis of how future generations are going to know that this is hazardous and toxic site, since there is no known language and/or symbols that are currently known from past generations longer than 5,000 years to warn us today. Current data has to establish "[t]he disposal of depleted uranium poses similar long-term radiological hazards to disposal of some types of transuranic wastes, and will likely require the development of a repository comparable to the Waste Isolation Pilot Plant in New Mexico."<sup>1</sup> With that said, analysis is needed to demonstrate that EngerySolutions is comparable to that of the Waste Isolation Pilot Plant in New Mexico and will become similar. Various Nuclear Regulatory Commission studies have stated that depleted uranium needs to be disposed in deep earth repositories, similar to the New Mexico facility; analysis is needed to demonstrate why and how depleted uranium should be stored in a shallow earth disposal site, such as EnergySolutions?

**SPECIFIC COMMENTS:** (Section (1) (a)): "... and exhumation by burrowing animals..." This needs to be removed, since other animals that are not considered burrowing animals but feed off burrowing animals could cause problems. Therefore the phase should read "and exhumation by any animal."

<sup>1</sup> Smith, Bruce, "Insurmountable Risks: The Dangers of Using Nuclear Power to Combat Global Climate Change"; Copyright 2006; page 291.

(Vide Section): *"The analyses shall clearly identify and differentiate between the roles performed by the natural disposal site characteristics and design features in isolating and segregating the wastes."* This statement assumes that there will be differentiated performance roles between natural disposal site characteristics to design features in the segregating of the waste. This might not always be the case over time, for following reasons: human error is a known factor that has occurred at the site over its lifespan today. To date there has not been any data to establish that materials design features will be able to withstand the amount of depleted uranium over the necessary time period required for protection to prevent contamination into nature resources. Ergo it is not clear how isolation will occur or can occur; a distinction is needed.

(Vide Section): *"The analyses shall clearly demonstrate a reasonable assurance that the exposures to humans from the release of radioactivity will not exceed the limits set forth in R313-25-19."* This statement makes the assumption that harmful effects from radiation exposure are linear, while it is now known that low doses of radiation may have a disproportionately greater effect than would be expected from a linear model. Analysis needs to occur with materials that are not radioactive. The Statement makes the assumption that the radioactive material will not be "mixed" with other materials. There needs to be cumulative and synergetic analysis included. The term "reasonable assurance" is a loaded statement without any regulatory or judicial clarification, and is a political statement. Ergo, the word "reasonable" needs to be removed, or clearly defined such that it is enforceable regulatory and judicially.

(Section (1) (b)): *"Analyses of the protection of inadvertent intruders shall demonstrate a reasonable assurance that the waste classification and segregation requirements will be met and that adequate barriers to inadvertent intrusion will be provided."* This statement assumes that there will be a time limit and ownership will be maintained to assure protection, and that segregation of waste will not occur over time. The facility has had notices of violation dealing with segregation requirements in the past; there is no assurance that this type of violation will not occur in the future. There have been media reports that the facility is looking into "mixing/blending" other materials in hopes of decreasing concentration of the radioactive isotopes. Again the phrase "reasonable assurance" needs to be clarified. Inadvertent intruders need to include rogue employees as well. Who will be responsible for intruders after the facility has completed closure? This needs to be addressed.

(Section (1) (c)): *"Analysis of the protection of individuals during operations shall include assessments of expected exposures due to routine operations and likely accidents during handling, storage, and disposal of waste. The analysis shall provide reasonable assurance that exposures will be controlled to meet the requirements of R313-15."* This statement makes the assumption that harmful effects from radiation exposure are linear, while now it is known that low doses of radiation may have a disproportionately greater effect than would be expected from a linear model. Ergo analysis is needed for a non-linear exposure effects.

(Section (1) (d)): *"Analyses of the long-term stability of the disposal site shall be based upon analyses of active natural processes including erosion, mass wasting, slope failure, settlement of wastes and backfill, infiltration through covers over disposal areas and adjacent soils, and surface drainage of the disposal site. The analyses shall provide reasonable assurance that there*

will not be a need for ongoing active maintenance of the disposal site following closure.” The analysis needs to include natural geologic changes, climate changes, changes in water table and surface water due to geological and climate change. Maintenance needs to occur long after closure due to the radioactivity increasing as the depleted uranium decays. If not, then analysis is needed on the cost of maintenance after the facility is long gone. There needs to be analysis of “mixing/blending,” as been reported in the media, from the facility.

(Section (2)(a)): “ *Any facility that proposes to land dispose of significant quantities of depleted uranium, more than one metric ton in total accumulation, after [effective date of rule] shall Submit for the Executive Secretary’s review and approval a performance assessment that demonstrates that the performance standards specified in 10 CFR Part 61 and corresponding Provisions of Utah rules will be met for the total quantities of depleted uranium and other wastes, including wastes already disposed of and the quantities of depleted uranium the facility now proposes to dispose. Any such performance assessment shall be revised as needed to reflect ongoing guidance and rulemaking from NRC. For purposes of this performance assessment, the compliance period will be a minimum of 10,000 years. Additional simulations will be performed for a qualitative analysis for the period where peak dose occurs.* ” All performance evaluation needs to have public input and transparency. There should be a set limit on the amount allowed with no exceptions. The performance assessment of 10,000 years is too short and needs to be expanded. The qualitative analysis for peak dose makes the assumption that harmful effects from radiation exposure are linear, while now it is known that low doses of radiation may have a disproportionately greater effect than would be expected from a linear model. Ergo qualitative analysis for peak doses needs to include non-linear exposures.

(Section (2) (b) ) : “*No facility may dispose of significant quantities of depleted uranium prior to the approval by the Executive Secretary of the performance assessment required in R313-25-8 (2)(a).*” This statement assumes that there will be significant quantities of depleted uranium disposed of at the facility; a limit on the amount is needed, such that a performance assessment can be made. All performance assessment must include public input and transparency.

In précis, the proposed regulation is reactionary and lacks foresight. It is to protect profits over human health and the environment. Technical analysis needs to be transparent and have peer review. Any and all consultants that are used need to be independent of EnergySolutions and the State of Utah, and must be able to be confirmed by the public. Performance assessments need to have public oversight and input. Uncertainties need to be analyzed. Geological and climate changes need to be analyzed. Long and short-term costs need to be analyzed for storage and disposal. There needs be a limit placed on quantity as well as the concentration of depleted uranium. There needs be analysis of why there is change in using shallow disposal versus deep inject disposal. All assumptions must be treated as actuaries. There needs to be analysis on who will be responsible after closure.