DANE L. FINERFROCK, EXEC. SEC.
UTAH RADIATION CONTROL BOARD
DIVISION OF RADIATION CONTROL

RADIATION CONTROL BOARD

Department of Environmental Quality (Bldg #2),
Conference Room 101, 168 North 1950 West, Salt Lake City, Utah
3:00 – 5:00 P.M., April 13, 2010

TENTATIVE AGENDA

I. Minutes **(Board Action Item)**
   a. Approval of the Minutes from the March 9, 2010 Board Meeting

II. Rules
   No Items

III. Radioactive Materials Licensing/Inspection **(Board Action Items)**
   a. Proposed Amendment to R313-21, "General Licenses"
   b. Proposed Amendment to R313-34, "Requirements for Irradiators"

IV. X-Ray Registration/Inspection
   No Items

V. Radioactive Waste Disposal
   a. Effective date for the Depleted Uranium Rule, R313-25-8 **(Board Action Item)**
   b. Presentation: Policy and Legal Considerations for a Blending Rule by Randy Horiuchi **(Board Information Item)**
   c. Recommendations from the Radiation Control Board Subcommittee: Waste Blending **(Board Action Item)**

VI. Uranium Mill Licensing and Inspection
   No Items

VII. Other Division Issues **(Board Information Item)**
   a. Division of Radiation Control Quarterly Activities Report

VIII. Public Comment

IX. **The Next Scheduled Board Meeting: May 11, 2010 (Tuesday)**, DEQ Bldg #2, Conference Room 101, 168 North 1950 West, Salt Lake City, Utah 3:00 – 5:00 P.M.

For those individuals needing special assistance in accordance with the Americans with Disabilities Act, please contact Brooke Baker at the Utah Department of Environmental Quality, at 168 North 1950 West, Salt Lake City, UT 84116, Office of Human Resources at (801) 536-4412, TDD (801) 536-4414, or by email at: bbaker@utah.gov.

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I. Minutes (Board Action Item)

a. Approval of the Minutes from the March 9, 2010 Board Meeting

2

II. Rules

No Items

3

III. Radioactive Materials Licensing/ Inspection (Board Action Items)

a. Proposed Amendment to R313-21, "General Licenses"

b. Proposed Amendment to R313-34, "Requirements for Irradiators"

4

IV. X-Ray Registration/Inspection

No Items

5

V. Radioactive Waste Disposal

a. Effective date for the Depleted Uranium Rule, R313-25-8 (Board Action Item)

b. Presentation: Policy and Legal Considerations for a Blending Rule by Randy Horiuchi (Board Information Item)

(Continue Next Section – Item V. c.)

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V. Radioactive Waste Disposal (Continue)

c. Recommendations from the Radiation Control Board Subcommittee: Waste Blending (Board Action Item)

VI. Uranium Mill Licensing and Inspection

No Items

7

VII. Other Division Issues (Board Info Item)

a. Division of Radiation Control Quarterly Activities Report

8

VIII. Public Comment

IX. Other Issues:

The Next Scheduled Board Meeting: May 11, 2010 (Tuesday), DEQ Bldg #2, Conference Room 101, 168 North 1950 West, Salt Lake City, Utah, 3:00 – 5:00 P.M.

AVERY READY INDEX

I. Minutes (Board Action Item)

a. Approval of the Minutes from the March 9, 2010 Board Meeting

MINUTES

OF

THE UTAH RADIATION CONTROL BOARD

March 9, 2010

Department of Environmental Quality, DEQ Building #2

Conference Room 101

168 N 1950 W

Salt Lake City, Utah 84114-4850

BOARD MEMBERS PRESENT
Peter A. Jenkins, M.S., CHP, Chair
Elizabeth Goryunova, M.S., Vice Chair
Dane L. Finerfrock, Executive Secretary
Scott Bird
Patrick D. Cone
Frank D. DeRosso, MSPH, CIH
Christian K. Gardner
Edd Johnson
Douglas S. Kimball, DMD
Joseph K. Miner, M.D., MSPH
Amanda Smith, DEQ Executive Director
John W. Thomson, M.D.
David A. Tripp, Ph.D.

BOARD MEMBERS ABSENT/EXCUSED
Colleen Johnson

DRC STAFF/OTHER DEQ MEMBERS PRESENT
Charles Bishop, DRC Staff
Kevin Carney, DRC Staff
Denise Chancellor, Attorney, Atty General's Office
David Esser, DRC Staff
Phil Goble, DRC Staff
John Hultquist, DRC Section Manager
Boyd Imai, DRC Staff
Brad Johnson, Deputy Director for DEQ
Craig Jones, DRC Section Manager
Loren Morton, DRC Staff
Yoli Necochea, DRC Staff

DRC STAFF/OTHER DEQ MEMBERS PRESENT- CONTINUE
Ray Nelson, DRC Staff
Sonja Robinson, DRC Staff
Tom Rushing, DRC Staff
Donna Spangler, PIO, DEQ – PPA Staff

PUBLIC
Attachment: Public Attendance List

GREETINGS/MEETING CALLED TO ORDER

Peter A. Jenkins, Chairman, called the Board meeting to order at 3:00 p.m. and welcomed the Board members and the public. He indicated that if the public wished to address any items on the agenda, they should sign the public, sign-in sheet. Those desiring to comment would be given an opportunity to address their concerns during the comment period.

I. APPROVAL OF MINUTES (Board Action Item)

a. Approval of the Minutes from the February 9, 2010 Board Meeting

Peter A. Jenkins, Chairman, asked the Board members for corrections to the minutes from February 9, 2010. There were no corrections to the minutes.

MOTION MADE BY EDD JOHNSON TO APPROVE THE MINUTES OF FEBRUARY 9, 2010

MOTION SECONDED BY DAVID A. TRIPP

MOTION CARRIED AND PASSED UNANIMOUSLY

II. RULES

No Items

III. RADIOACTIVE MATERIALS LICENSING/INSPECTION

No Items

IV. X-RAY REGISTRATION/INSPECTION

No Items

V. Radioactive Waste Disposal (Board Information Item)

a. Discussion of Stakeholder Responses to the Chairman's Questions About Waste Blending

Peter A. Jenkins, Chairman, informed the Board on this item. He said that at last month's Board meeting, he had asked the stakeholders to respond to a list of questions. As the responses came in from the stakeholders and the public, the Executive Secretary forwarded them to the members of the Board and to the subcommittee. Chairman Jenkins reported that the subcommittee was considering the responses and would make a recommendation to the Board. However, he invited the Board members to discuss the stakeholder's and the public's responses.

The Board members discussed questions **that had been submitted with representatives from HEAL-Utah and Energy*Solutions* at the meeting.**

VI. URANIUM MILL LICENSING AND INSPECTION

No Items

VII. OTHER DIVISION ISSUES

a. Update on Proposed License Condition 35., Energy*Solutions*, UT 2300249 (Board Information Item)

Dane Finerfrock, Executive Secretary, reported on this item. He said that radioactive material license **number** UT 2300249 had been amended to include License Condition 35. The license had been amended on March 2, 2010, and License Condition 35 was now in effect. He said that the Division would be working with Energy*Solutions* over the next few weeks to make certain that the provisions of the license condition were being met.

b. Monthly Report:

i. Moab Mill Tailings Remediation Project (Board Information Item)

Dane Finerfrock, Executive Secretary, reported that Connie Nakahara, DEQ Liaison, would be updating the Board. He said that she had submitted a report to the Board regarding the Moab Tailings Project. Ms. Nakahara was DEQ's liaison from the Department of Energy for the Moab Mill Tailings Clean-Up Project. He said that Ms. Nakahara routinely provided reports to the Board to let them know what was happening with the clean-up project in Moab.

Mr. Finerfrock informed the Board that in previous years the Board had met in autumn each year in Moab. It gave the Board the opportunity to see the progress of the Moab Tailings Project and for them to hear from local citizens. He suggested that the Board consider holding a future meeting in Moab. The meeting would provide Board members with an opportunity to observe two projects: **(1)** the Moab Mill Tailings Site near Moab and **(2)** the disposal site at Crescent Junction.

ii. Savannah River Depleted Uranium Sampling (Board Information Item)

Dane Finerfrock, Executive Secretary, reported that last week the Division sent the final batch of samples to Everland Laboratory in Oak Ridge, Tennessee. Both the Division of Radiation Control's staff and Energy*Solutions'* staff provided support. The Division took samples from 171 of the drums from Savannah River. Technitium-99 is the isotope that the Division has asked the lab to provide data on. The results are expected, before the end of the month. The Division is looking forward to having a good understanding of what was contained in the "representative drums" that were sampled.

Questions by the Board:
Christian K. Gardner asked if the lab results would be made public, and if the Board would know the results by the next Board meeting.

Dane Finerfrock, Executive Secretary, said Amanda Smith, Executive Director, would give the results to Governor Gary R. Herbert. The Governor could elect to announce the information himself or he could ask the Executive Director to do it. It would be made public. Mr. Finerfrock said that he hoped it would be made public by the April 13, 2010 Board meeting.

Amanda Smith, Executive Director, said that Governor Herbert had invited the Department of Energy (DOE) and someone from the Governor's Office to attend the April Board meeting. She said, hopefully, the reports will be back and it can be discussed with them.

iii. Division of Radiation Control Activities Report (Board Information Item)

Dane Finerfrock, Executive Secretary, referred the Board to a report in their Board packet. It provided details about a Notice of Violation and a Settlement Agreement that was reached between the Division of Radiation Control and Denison Mine Uranium Mill. Mr. Finerfrock said the Board to recall that the Board had asked the Division to report to the Board when a Notice of Violation resulted in a $4,000 monetary penalty. The penalty was the result of Denison not using an approved laboratory for their ground-water samples on multiple occasions.

Questions by the Board:
The Board members had additional questions and discussion. Dane Finerfrock answered the Board's questions

VIII. PUBLIC COMMENT

IX. The Next Scheduled Board Meeting: April 13, 2010 (Tuesday), DEQ Bldg #2, Conference Room 101, 168 North 1950 West, Salt Lake City, Utah 3:00 – 5:00 P.M. THE BOARD MEETING ADJOURNED AT 3:56 P.M.

I. Minutes (Board Action Item)

a. Approval of the Minutes from the March 9, 2010 Board Meeting

Public Attendance List – March 9, 2010

Public Attendance Sheet

Utah Radiation Control Board Meeting

DEQ Bldg. #2, Conf. Room 101
168 N 1950 W, Salt Lake City, UT 84114-4850
3:00 – 5:00 p.m.

March 9, 2010

Please Print

NAME (Please Print)	Organization/Affiliation Phone Number and Email Address:	Speak: Yes or No? If Yes, which Agenda Item would you like to Address, List Item No.:
1. Amy Joi Odonoghue	Deseret News	No
2. James O'Neal	Citizen	V, VIII
3. Joan Sweet	Gamma West	
4. Mark Ledoux	Energy Solutions	No
5. Sean McCandless	Energy Solutions	No
6. Tom Rushing	UT DRC	No
7. Tim Gillie	Tooele Transport.	No
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Public Attendance Sheet

Utah Radiation Control
Board Meeting
DEQ Bldg. #2, Conf. Room 101
168 N 1950 W, Salt Lake City, UT 84114-4850
3:00 – 5:00 p.m.
March 9, 2010
Please Print

NAME (Please Print)	Organization/Affiliation Phone Number and Email Address:	Speak: Yes or No? If Yes, which Agenda Item would you like to Address, List Item No.:
96. Dan Shram	EnergySolutions	X/8
97. David Esser	DRC	No
98. Randy Horn	Studvik	no
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III. Radioactive Materials Licensing/Inspection

a. Proposed Amendment to R313-21, "General Licenses" (Board Action Items)

UTAH RADIATION CONTROL RULES

BOARD ACTION ITEM

R313-19 "Requirements of General Applicability to Licensing of Radioactive Material"

R313-21 "General Licenses"

Philip Griffin will discuss a proposed amendment to rules R313-19-13 and 30 and R313-21-22. The rule changes are a result of changes to the U.S. Nuclear Regulatory Commission's (NRC) regulations in 10 CFR Parts 30, 31, 32, and 150.

The changes to R313-19-13 and 30 include:

Removing obsolete references to items or products containing exempt quantities of radioactive material;

A specific exemption for smoke detectors containing no more than 1 microcurie of Americium-241;

A prohibition on the aggregation of exempt quantities of radioactive material to a quantity in excess of the limits in R313-19-71;

A prohibition on the introduction of radioactive material into a product or material that may be transferred to a person who is exempt from the rules, except in accordance with a specific license issued pursuant to R313-22-75(1); and

A prohibition on out-of-state licensees to transfer or dispose of radioactive material to a person who is exempt from the rules.

The changes to R313-21 include:

Requirements for individuals possessing devices under a general license to be able to transfer these devices to the individual's specific license;

A correction of a typographical error; and

A correction of an incorrect rule citation.

Recommendation

The Executive Secretary recommends that the Board approve the proposed changes to the Utah Radiation Control Rules, direct staff to file the changes for rule making, and direct staff to give notice to the public of a 30-day comment period.

NOTICE OF PROPOSED RULE AMENDMENT

- The agency identified below in box 1 provides notice of proposed rule change pursuant to Utah Code Section 63G-3-301.
- Please address questions regarding information on this notice to the agency.
- The full text of all rule filings is published in the Utah State Bulletin unless excluded because of space constraints.
- The full text of all rule filings may also be inspected at the Division of Administrative Rules.

Rule Information

DAR file no: Date filed:
State Admin Rule Filing Key: 149588
Utah Admin. Code ref. (R no.): R313-19

Agency Information

1. Agency: ENVIRONMENTAL QUALITY - Radiation Control

Room no.: 212
Building:
Street address 1: 168 N 1950 W
Street address 2:
City, state, zip: SALT LAKE CITY UT 84116-3085
Mailing address 1: PO BOX 144850
Mailing address 2:
City, state, zip: SALT LAKE CITY UT 84114-4850

Contact person(s):

Name:	Phone:	Fax:	E-mail:	Remove:
Philip Griffin	801-536-4261	801-533-4097	pgriffin@utah.gov	

(Interested persons may inspect this filing at the above address or at DAR during business hours)

Rule Title

2. Title of rule or section (catchline):
Requirements of General Applicability to Licensing of Radioactive Material

Notice Type

3. Type of notice: Amendment

Rule Purpose

4. Purpose of the rule or reason for the change:
   This rule is being changed due to changes to the U.S. Nuclear Regulatory Commission's (NRC) regulations in 10 CFR Parts 30, 32, and 150 that were effective on December 17, 2007. The State has entered into an agreement with the NRC to establish and maintain a compatible program for the control of radioactive material in Utah. These changes are necessary to maintain the compatibility of the Utah Radiation Control Rules with federal regulations.

Response Information

5. This change is a response to comments by the Administrative Rules Review Committee.
   ◉ No ○ Yes

Rule Summary

6. Summary of the rule or change:
   The changes are to two sections of the rule: R313-19-13 and R313-19-30. The changes to R313-19-13 remove references to obsolete items or products containing quantities of radioactive materials that are exempt from regulation, and adds an exemption for smoke detectors that contain no more than one microcurie of Americium-241 per detector. The changes also prohibit the aggregation of exempt quantities of radioactive material to a quantity in excess of the limits in R313-19-71, and does not allow a person to introduce radioactive material into a product or material that may be transferred to a person who is exempt from R313-19-13(2)(a)(i) except in accordance with a specific license issued pursuant to R313-22-75(1). The change to R313-19-30 does not allow out-of-state licensees to transfer or dispose of radioactive material possessed or used under R313-19-30(1) to a person who is exempt from R313-19-13(2)(a) [exempt concentrations of radioactive material other than source material].

Aggregate Cost Information

7. Aggregate anticipated cost or savings to:

A) State budget:

Affected: ◉ No ○ Yes

The proposed changes are not anticipated to have any impact on the State budget since the changes deal with quantities and concentrations of radioactive material that are exempt from the rules. The Utah Division of Radiation Control (Division) may incur additional enforcement costs if a person were to attempt to aggregate exempt quantities of radioactive material, or to introduce radioactive materials into a product or material that may be distributed to a person exempt from the rules. However, the Division is not aware of any such activity occurring in the State at this time.

B) Local government:

Affected: ◉ No ○ Yes

The proposed changes are not anticipated to have any fiscal impact on local government since local government would not be involved in any regulatory activity associated with the affected rule, and local government entities would not be involved in activities addressed by the changes (e.g., the aggregation of exempt quantities of radioactive material, the introduction of radioactive material into a product that may be distributed to a person exempt from the rules, etc...).

C) Small businesses:

Affected: ◉ No ○ Yes

("small business" means a business employing fewer than 50 persons)

There is no anticipated fiscal affect on small businesses from the proposed rule changes, except for small businesses that may engage in the aggregation of exempt quantities of radioactive material or the introduction of radioactive material into a product that may be distributed to a person exempt from the rules. The impact on affected small businesses is addressed in Item 8 of this form "Compliance costs for affected persons."

D) Persons other than small businesses, businesses, or local government entities:

Affected: ◉ No ○ Yes

("person" means any individual, partnership, corporation, association, governmental entity, or public or private organization of any character other than an agency)

There is no anticipated fiscal affect on other persons from the proposed rule changes, except for persons that may engage in the aggregation of exempt quantities of radioactive material or the introduction of radioactive material into a product that may be distributed to a person exempt from the rules. The impact on affected persons is addressed in Item 8 of this form "Compliance costs for affected persons."

Compliance Cost Information

8. Compliance costs for affected persons:
The Division is not aware of any person who will be considered an "affected person" because of the changes to the rule; however, there are compliance costs associated with anyone who may engage in an activity that is prohibited or limited by the rule change. One potential financial impact on affected persons is the prohibition on aggregating exempt quantities of radioactive material in order to produce an increased radiation level. After the rule is changed, persons wanting to produce an increased radiation level in a product or material will have to obtain and use quantities of radioactive material that will require the person to apply for and be issued a specific license by the Division. The costs for a specific license vary depending on the license category that is appropriate to the proposed use of the radioactive material. For example, the costs for a manufacturing and distribution license are $1,670.00 initial/renewal fee and $2,040.00 annual fee. The fees for a research and development license are $700.00 initial/renewal and $940.00 annual. Other persons affected by the proposed rule changes are those persons receiving products or materials from out-of-state persons who possess a radioactive material license from the NRC or another Agreement State who want to introduce radioactive material into a product or material. After the proposed rule changes are in effect, these out-of-state licensees will only be allowed to distribute the product or material containing radioactive material to persons who have been issued a specific radioactive material license by the Division to possess such a product or material. The fees for specific licenses in Utah for the customers of the out-of-state licensees vary depending on the intended use of the product or material containing radioactive material being distributed by the out-of-state licensee. The fees may range from $440.00 (initial/renewal) and $520.00 (annual) for gauge users to $1670.00 (initial/renewal) and $2560.00 (annual) for industrial radiography. All cost estimates are for the potential that there may be a person who may be affected by the rule change. However, as stated above, the Division is unaware of any person who will be affected by this rule change.

Department Head Comments

9. A) Comments by the department head on the fiscal impact the rule may have on businesses:
The proposed changes to the rule are necessary for the Utah Radiation Control Rules to be compatible with NRC requirements, and the Division's program activities are adequate to protect the public health and safety. The Division is not aware of any business that would be impacted fiscally due to the proposed rule changes. Any future fiscal impact to businesses from this rule making will be that those seeking to engage in the activities affected by the rule changes will need to obtain a specific license from the Division for those activities.
B) Name and title of department head commenting on the fiscal impacts:
Amanda Smith, Executive Director

Citation Information

10. This rule change is authorized or mandated by state law, and implements or interprets the following state and federal laws.
State code or constitution citations (required) (e.g., Section 63G-3-402; Subsection 63G-3-601(3); Article IV) :
Sections 19-3-104(4) and 19-3-104(8)

Incorporated Materials

11. This rule adds, updates, or removes the following title of materials incorporated by references (a copy of materials incorporated by reference must be submitted to DAR; if none, leave blank) :

Official Title of Materials Incorporated (from title page)
Publisher
Date Issued
Issue, or version
ISBN Number
ISSN Number
Cost of Incorporated Reference
Adds, updates, removes-- SELECT ONE --

Comments

12. The public may submit written or oral comments to the agency identified in box 1. (The public may also request a hearing by submitting a written request to the agency. The agency is required to hold a hearing if it receives requests from ten interested persons or from an association having not fewer than ten members. Additionally, the request must be received by the agency not more than 15 days after the publication of this rule in the Utah State Bulletin. See Section 63G-3-302 and Rule R15-1 for more information.)

A) Comments will be accepted until 5:00 p.m. on (mm/dd/yyyy) : 05/31/2010

B) A public hearing (optional) will be held:

On (mm/dd/yyyy): At (hh:mm AM/PM): At (place):

Proposed Effective Date

13. This rule change may become effective on (mm/dd/yyyy): 06/09/2010

NOTE: The date above is the date on which this rule MAY become effective. It is NOT the effective date. After the date designated in Box 12(A) above, the agency must submit a Notice of Effective Date to the Division of Administrative Rules to make this rule effective. Failure to submit a Notice of Effective Date will result in this rule lapsing and will require the agency to start the rulemaking process over.

Indexing Information

14. Indexing information - keywords (maximum of four, one term per field, in lower case, except for acronyms (e.g., "GRAMA") or proper nouns (e.g., "Medicaid")):
license, reciprocity, exemptions, transportation

File Information

15. Attach an RTF document containing the text of this rule change (filename):
There is a document associated with this rule filing.

To the Agency

Information requested on this form is required by Sections 63G-3-301, 302, 303, and 402. Incomplete forms will be returned to the agency for completion, possibly delaying publication in the Utah State Bulletin, and delaying the first possible effective date.

Agency Authorization

Agency head or designee, and title:	Dane Finerfrock Director	Date (mm/dd/yyyy): 04/01/2010

R313. Environmental Quality, Radiation Control.
R313-19. Requirements of General Applicability to Licensing of Radioactive Material.
R313-19-13. Exemptions.

(1) Source material.

(a) A person is exempt from Rules R313-19, R313-21, and R313-22 to the extent that the person receives, possesses, uses, owns, or transfers source material in a chemical mixture, compound, solution or alloy in which the source material is by weight less than 1/20 of one percent (0.05 percent) of the mixture, compound, solution, or alloy.

(b) A person is exempt from Rules R313-19, R313-21, and R313-22 to the extent that the person receives, possesses, uses or transfers unrefined and unprocessed ore containing source material; provided, that, except as authorized in a specific license, such person shall not refine or process the ore.

(c) A person is exempt from Rules R313-19, R313-21, and R313-22 to the extent that the person receives, possesses, uses or transfers:

(i) any quantities of thorium contained in:

(A) incandescent gas mantles,

(B) vacuum tubes,

(C) welding rods,

(D) electric lamps for illuminating purposes: provided that, each lamp does not contain more than 50 milligrams of thorium,

(E) germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting provided that each lamp does not contain more than two grams of thorium,

(F) rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent by weight thorium, uranium, or any combination of these, or

(G) personnel neutron dosimeters provided that each dosimeter does not contain more than 50 milligrams of thorium;

(ii) source material contained in the following products:

(A) glazed ceramic tableware, provided that the glaze contains not more than 20 percent by weight source material,

(B) piezoelectric ceramic containing not more than two percent by weight source material, or

(C) glassware containing not more than ten percent by weight source material, but not including commercially manufactured glass brick, pane glass, ceramic tile, or other glass or ceramic used in construction;

(iii) photographic film, negatives and prints containing uranium or thorium;

(iv) a finished product or part fabricated of, or containing, tungsten-thorium or magnesium-thorium alloys, provided that the thorium content of the alloy does not exceed four percent by weight and that this exemption shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of the product or part;

(v) uranium contained in counterweights installed in aircraft, rockets, projectiles, and missiles, or stored or handled

in connection with installation or removal of the counterweights, provided that:

(A) the counterweights are manufactured in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission authorizing distribution by the licensee pursuant to 10 CFR Part 40,

(B) each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM",

(C) each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED",

(D) The requirements specified in Subsections R313-19-13(1)(c)(v)(B) and (C) need not be met by counterweights manufactured prior to December 31, 1969, provided that such counterweights are impressed with the legend, "CAUTION - RADIOACTIVE MATERIAL - URANIUM", as previously required by the rules, and

(E) the exemption contained in Subsection R313-19-13(1)(c)(v) shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of counterweights other than repair or restoration of any plating or other covering;

(vi) natural or depleted uranium metal used as shielding constituting part of a shipping container which is conspicuously and legibly impressed with the legend "CAUTION - RADIOACTIVE SHIELDING - URANIUM" and the uranium metal is encased in mild steel or equally fire resistant metal of minimum wall thickness of one eighth inch (3.2 mm);

(vii) thorium contained in finished optical lenses, provided that each lens does not contain more than 30 percent by weight of thorium, and that this exemption shall not be deemed to authorize either:

(A) the shaping, grinding, or polishing of a lens or manufacturing processes other than the assembly of such lens into optical systems and devices without alteration of the lens, or

(B) the receipt, possession, use, or transfer of thorium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical instruments;

(viii) uranium contained in detector heads for use in fire detection units, provided that each detector head contains not more than 0.005 microcurie (185.0 Bq) of uranium; or

(ix) thorium contained in a finished aircraft engine part containing nickel-thoria alloy, provided that:

(A) the thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide), and

(B) the thorium content in the nickel-thoria alloy does not exceed four percent by weight.

(d) The exemptions in Subsection R313-19-13(1)(c) do not authorize the manufacture of any of the products described.

(2) Radioactive material other than source material.

(a) Exempt concentrations.

(i) Except as provided in Subsection R313-19-13(2)(a)(ii) a

person is exempt from Rules R313-19, R313-21 and R313-22 to the extent that the person receives, possesses, uses, transfers, owns or acquires products or materials containing:

(A) radioactive material introduced in concentrations not in excess of those listed in Section R313-19-70, or

(B) natural occurring radioactive materials containing less than 15 picocuries per gram radium-226.

(ii) A person may not introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under Subsection R313-19-13(2)(a)(i) or equivalent regulations of a Licensing State, the U.S. Nuclear Regulatory Commission or an Agreement State, except in accordance with a specific license issued pursuant to Subsection R313-22-75(1)[~~ or the general license provided in Section R313-19-30~~].

(b) Exempt quantities.

(i) Except as provided in Subsections R313-19-13(2)(b)(ii)[~~ and (iii)~~]through (iv) a person is exempt from these rules to the extent that the person receives, possesses, uses, transfers, owns, or acquires radioactive material in individual quantities which do not exceed the applicable quantity set forth in Section R313-19-71.

(ii) Subsection R313-19-13(2)(b) does not authorize the production, packaging or repackaging of radioactive material for purposes of commercial distribution, or the incorporation of radioactive material into products intended for commercial distribution.

(iii) A person may not, for purposes of commercial distribution, transfer radioactive material in the individual quantities set forth in Section R313-19-71, knowing or having reason to believe that the quantities of radioactive material will be transferred to persons exempt under Subsection R313-19-13(2)(b) or equivalent regulations of a Licensing State, the U.S. Nuclear Regulatory Commission or an Agreement State, except in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, pursuant to 10 [~~C.F.R.~~]CFR Part 32 or by the Executive Secretary pursuant to Subsection R313-22-75(2), which license states that the radioactive material may be transferred by the licensee to persons exempt under Subsection R313-19-13(2)(b) or the equivalent regulations of a Licensing State, the U.S. Nuclear Regulatory Commission or an Agreement State.

(iv) A person who possesses radioactive material received or acquired prior to September 25, 1971, under the general license formerly provided in 10 [~~C.F.R.~~]CFR Part 31.[~~5~~]4 is exempt from the requirements for a license set forth in Rule R313-19 to the extent that the person possesses, uses, transfers or owns the radioactive material. This exemption does not apply for radium-226.

(v) No person may, for purposes of producing an increased radiation level, combine quantities of radioactive material covered by this exemption so that the aggregate quantity exceeds the limits set forth in R313-19-71, except for radioactive material combined within a device placed in use before May 3,

1999, or as otherwise provided by these rules.

(c) Exempt items.

(i) Certain items containing radioactive material. Except for persons who apply radioactive material to, or persons who incorporate radioactive material into the following products, a person is exempt from these rules to the extent that person receives, possesses, uses, transfers, owns or acquires the following products:

(A) Timepieces or hands or dials containing not more than the following specified quantities of radioactive material and not exceeding the following specified levels of radiation:

(I) 25 millicuries (925.0 MBq) of tritium per timepiece;

(II) five millicuries (185.0 MBq) of tritium per hand;

(III) 15 millicuries (555.0 MBq) of tritium per dial. Bezels when used shall be considered as part of the dial;

(IV) 100 microcuries (3.7 MBq) of promethium-147 per watch or 200 microcuries (7.4 MBq) of promethium-147 per any other timepiece;

(V) 20 microcuries (0.74 MBq) of promethium-147 per watch hand or 40 microcuries (1.48 MBq) of promethium-147 per other timepiece hand;

(VI) 60 microcuries (2.22 MBq) of promethium-147 per watch dial or 120 microcuries (4.44 MBq) of promethium-147 per other timepiece dial. Bezels when used shall be considered as part of the dial;

(VII) the radiation dose rate from hands and dials containing promethium-147 will not exceed, when measured through 50 milligrams per square centimeter of absorber:

for wrist watches, 0.1 millirad (1.0 uGy) per hour at ten centimeters from any surface;

for pocket watches, 0.1 millirad (1.0 uGy) per hour at one centimeter from any surface;

for other timepieces, 0.2 millirad (2.0 uGy) per hour at ten centimeters from any surface;

(VIII) one microcurie (37.0 kBq) of radium-226 per timepiece in timepieces manufactured prior to the effective date of these rules.

(B) [~~Lock illuminators containing not more than 15 millicuries (555.0 MBq) of tritium or not more than two millicuries (74.0 MBq) of promethium 147 installed in automobile locks. The levels of radiation from each lock illuminator containing promethium 147 will not exceed one millirad (10 uGy) per hour at one centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.~~

~~(C)~~] Precision balances containing not more than one millicurie (37.0 MBq) of tritium per balance or not more than 0.5 millicurie (18.5 MBq) of tritium per balance part manufactured before June 9, 2010.

~~[(D) Automobile shift quadrants containing not more than 25 millicuries (925 MBq) of tritium.~~

~~(E)~~](C) Marine compasses containing not more than 750 millicuries (27.8 GBq) of tritium gas and other marine navigational instruments containing not more than 250 millicuries

(9.25 GBq) of tritium gas manufactured before June 9, 2010.

[~~(F) Thermostat dials and pointers containing not more than 25 millicuries (925.0 MBq) of tritium per thermostat.~~

~~(G)~~]

(D) Ionization chamber smoke detectors containing not more than 1 microcurie (37 kBq) of americium-241 per detector in the form of a foil and designed to protect life and property from fires.

(E) Electron tubes, including spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pick-up tubes, radiation detection tubes, and other completely sealed tubes that are designed to conduct or control electrical currents; provided that each tube does not contain more than one of the following specified quantities of radioactive material:

(I) 150 millicuries (5.55 GBq) of tritium per microwave receiver protector tube or ten millicuries (370.0 MBq) of tritium per any other electron tube;

(II) one microcurie (37.0 kBq) of cobalt-60;

(III) five microcuries (185.0 kBq) of nickel-63;

(IV) 30 microcuries (1.11 MBq) of krypton-85;

(V) five microcuries (185.0 kBq) of cesium-137;

(VI) 30 microcuries (1.11 MBq) of promethium-147;

(VII) one microcurie (37.0 kBq) of radium-226;

and provided further, that the radiation dose rate from each electron tube containing radioactive material will not exceed one millirad (10.0 uGy) per hour at one centimeter from any surface when measured through seven milligrams per square centimeter of absorber.

[~~(H)~~](F) Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, one or more sources of radioactive material, provided that:

(I) each source contains no more than one exempt quantity set forth in Section R313-19-71; and

(II) each instrument contains no more than ten exempt quantities. For purposes of this requirement, an instrument's source(s) may contain either one type or different types of radionuclides and an individual exempt quantity may be composed of fractional parts of one or more of exempt quantities in Section R313-19-71, provided that the sum of the fractions shall not exceed unity;

(III) for purposes of Subsection R313-19-13(2)(c)(i)(H), 0.05 microcurie (1.85 kBq) of americium-241 is considered an exempt quantity under Section R313-19-71.

[~~(I) Spark gap irradiators containing not more than one microcurie (37.0 kBq) of cobalt-60 per spark gap irradiator for use in electrically ignited fuel oil burners having a firing rate of at least three gallons (11.4 liters) per hour.~~

]~~(ii)~~ Self-luminous products containing radioactive material.

(A) Tritium, krypton-85 or promethium-147. Except for persons who manufacture, process or produce self-luminous products

containing tritium, krypton-85 or promethium-147, a person is exempt from these rules to the extent that the person receives, possesses, uses, transfers, owns, or acquires tritium, krypton-85 or promethium-147 in self-luminous products manufactured, processed, produced, imported or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to 10 [C.F.R.]CFR Part 32.22, which license authorizes the transfer of the product to persons who are exempt from regulatory requirements. The exemption in Subsection R313-19-13(2)(c)(ii) does not apply to tritium, krypton-85, or promethium-147 used in products for frivolous purposes or in toys or adornments.

(B) Radium-226. A person is exempt from these rules, to the extent that such person receives, possesses, uses, transfers, or owns articles containing less than 0.1 microcurie (3.7 kBq) of radium-226 which were acquired prior to the effective date of these rules.

(iii) Gas and aerosol detectors containing radioactive material.

(A) Except for persons who manufacture, process, or produce gas and aerosol detectors containing radioactive material, a person is exempt from these rules to the extent that the person receives, possesses, uses, transfers, owns, or acquires radioactive material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards, provided that detectors containing radioactive material shall have been manufactured, imported, or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to 10 [~~C.F.R.~~]CFR Part 32.26, or a Licensing State pursuant to Subsection R313-22-75(3) or equivalent requirements, which authorizes the transfer of the detectors to persons who are exempt from regulatory requirements.

(B) Gas and aerosol detectors previously manufactured and distributed to general licensees in accordance with a specific license issued by an Agreement State shall be considered exempt under Subsection R313-19-13(2)(c)(iii)(A), provided that the device is labeled in accordance with the specific license authorizing distribution of the general licensed device, and provided further that they meet the requirements of Subsection R313-22-75(3).

(C) Gas and aerosol detectors containing naturally occurring and accelerator-produced radioactive material (NARM) previously manufactured and distributed in accordance with a specific license issued by a Licensing State shall be considered exempt under Subsection R313-19-13(2)(c)(iii)(A), provided that the device is labeled in accordance with the specific license authorizing distribution, and provided further that they meet the requirements of Subsection R313-22-75(3).

(iv) Capsules containing carbon-14 urea for "in vivo" diagnostic use for humans.

(A) Except as provided in Subsection R313-19-13(2)(c)(iv)(B), any person is exempt from the requirements in Rules R313-19 and R313-32 provided that the person receives,

possesses, uses, transfers, owns, or acquires capsules containing 37 kBq (1 uCi) carbon-14 urea (allowing for nominal variation that may occur during the manufacturing process) each, for "in vivo" diagnostic use for humans.

(B) Any person who desires to use the capsules for research involving human subjects shall apply for and receive a specific license pursuant to Rule R313-32.

(C) Nothing in Subsection R313-19-13(2)(c)(iv) relieves persons from complying with applicable United States Food and Drug Administration, other Federal, and State requirements governing receipt, administration, and use of drugs.

(v) [~~Resins containing scandium-46 and designed for sand consolidation in oil wells. A person is exempt from these rules to the extent that the person receives, possesses, uses, transfers, owns or acquires synthetic plastic resins containing scandium-46 which are designed for sand consolidation in oil wells. The resins shall have been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, or shall have been manufactured in accordance with the specifications contained in a specific license issued by the Executive Secretary or an Agreement State to the manufacturer of resins pursuant to licensing requirements equivalent to those in 10 C.F.R. Part 32.16 and 32.17. This exemption does not authorize the manufacture of any resins containing scandium-46.~~

~~(vi)~~]With respect to Subsections R313-19-13(2)(b)(iii), R313-19-13(2)(c)(i), (iii) and (iv), the authority to transfer possession or control by the manufacturer, processor, or producer of equipment, devices, commodities, or other products containing byproduct material whose subsequent possession, use, transfer, and disposal by other persons is exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

R313-19-30. Reciprocal Recognition of Licenses.

(1) Subject to these rules, a person who holds a specific license from the U.S. Nuclear Regulatory Commission, an Agreement State, or Licensing State, and issued by the agency having jurisdiction where the licensee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained, is hereby granted a general license to conduct the activities authorized in the licensing document within this state, except in areas of exclusive federal jurisdiction, for a period not in excess of 180 days in a calendar year provided that:

(a) the licensing document does not limit the activity authorized by the document to specified installations or locations;

(b) the out-of-state licensee notifies the Executive Secretary in writing at least three days prior to engaging in such activity. Notifications shall indicate the location, period, and type of proposed possession and use within the state, and shall be accompanied by a copy of the pertinent licensing document. If,

for a specific case, the three-day period would impose an undue hardship on the out-of-state licensee, the licensee may, upon application to the Executive Secretary, obtain permission to proceed sooner. The Executive Secretary may waive the requirement for filing additional written notifications during the remainder of the calendar year following the receipt of the initial notification from a person engaging in activities under the general license provided in Subsection R313-19-30(1);

(c) the out-of-state licensee complies with all applicable rules of the Board and with the terms and conditions of the licensing document, except those terms and conditions which may be inconsistent with applicable rules of the Board;

(d) the out-of-state licensee supplies other information as the Executive Secretary may request; and

(e) the out-of-state licensee shall not transfer or dispose of radioactive material possessed or used under the general license provided in Subsection R313-19-30(1) except by transfer to a person[~~:~~

~~(i)~~] specifically licensed by the Executive Secretary or by the U.S. Nuclear Regulatory Commission, a Licensing State, or an Agreement State to receive the material[~~, or~~

~~(ii) exempt from the requirements for a license for material under Subsection R313-19-13(2)(a)~~].

(2) Notwithstanding the provisions of Subsection R313-19-30(1), a person who holds a specific license issued by the U.S. Nuclear Regulatory Commission, a Licensing State, or an Agreement State authorizing the holder to manufacture, transfer, install, or service a device described in Subsection R313-21-22(4) within the areas subject to the jurisdiction of the licensing body is hereby granted a general license to install, transfer, demonstrate, or service a device in this state provided that:

(a) the person shall file a report with the Executive Secretary within thirty days after the end of a calendar quarter in which a device is transferred to or installed in this state. Reports shall identify each general licensee to whom a device is transferred by name and address, the type of device transferred, and the quantity and type of radioactive material contained in the device;

(b) the device has been manufactured, labeled, installed, and serviced in accordance with applicable provisions of the specific license issued to the person by the Nuclear Regulatory Commission, a Licensing State, or an Agreement State;

(c) the person shall assure that any labels required to be affixed to the device under rules of the authority which licensed manufacture of the device bear a statement that "Removal of this label is prohibited"; and

(d) the holder of the specific license shall furnish to the general licensee to whom the device is transferred or on whose premises a device is installed a copy of the general license contained in Subsection R313-21-22(4) or in equivalent rules of the agency having jurisdiction over the manufacture and distribution of the device.

(3) The Executive Secretary may withdraw, limit, or qualify

his acceptance of a specific license or equivalent licensing document issued by the U.S. Nuclear Regulatory Commission, a Licensing State or an Agreement State, or a product distributed pursuant to the licensing document, upon determining that the action is necessary in order to prevent undue hazard to public health and safety or the environment.

KEY: license, reciprocity, transportation, exemptions
Date of Enactment or Last Substantive Amendment: [~~October 8, 2007~~]June 9, 2010
Notice of Continuation: October 5, 2006
Authorizing, and Implemented or Interpreted Law: 19-3-104; 19-3-108

NOTICE OF PROPOSED RULE AMENDMENT

- The agency identified below in box 1 provides notice of proposed rule change pursuant to Utah Code Section 63G-3-301.
- Please address questions regarding information on this notice to the agency.
- The full text of all rule filings is published in the Utah State Bulletin unless excluded because of space constraints.
- The full text of all rule filings may also be inspected at the Division of Administrative Rules.

Rule Information

DAR file no: Date filed:
State Admin Rule Filing Key: 149589
Utah Admin. Code ref. (R no.): R313-21

Agency Information

1. Agency: ENVIRONMENTAL QUALITY - Radiation Control

Room no.: 212
Building:
Street address 1: 168 N 1950 W
Street address 2:
City, state, zip: SALT LAKE CITY UT 84116-3085
Mailing address 1: PO BOX 144850
Mailing address 2:
City, state, zip: SALT LAKE CITY UT 84114-4850

Contact person(s):

Name:	Phone:	Fax:	E-mail:	Remove:
Philip Griffin	801-536-4261	801-533-4097	pgriffin@utah.gov	

(Interested persons may inspect this filing at the above address or at DAR during business hours)

Rule Title

2. Title of rule or section (catchline):
General Licenses

Notice Type

3. Type of notice: Amendment

Rule Purpose

4. Purpose of the rule or reason for the change:
   This rule is being changed due to changes to the U.S. Nuclear Regulatory Commission's (NRC) regulations in 10 CFR Part 31 that were effective on December 17, 2007. The State has entered into an agreement with the NRC to establish and maintain a compatible program for the control of radioactive material in Utah. These changes are necessary to maintain the compatibility of the Utah Radiation Control Rules with federal regulations. There is also one typographical correction, and one correction of an incorrect rule citation.

Response Information

5. This change is a response to comments by the Administrative Rules Review Committee.
   ◉ No ○ Yes

Rule Summary

6. Summary of the rule or change:
   The rule change allows a licensee that has both a specific license and a general license to transfer a device from the general license to the specific license if: 1. The licensee's specific license allows for the possession of the device, or the specific license is amended to allow for possession of the device prior to the transfer; 2. The labeling on the device that is required because the device was initially distributed under a general license be removed or obliterated, and the device is labeled in accordance with rule R313-15-904 (including the manufacturer, model number and serial number); 3. The licensee obtains information concerning maintenance of the device that would be applicable under the specific license; and 4. The licensee reports the transfer to the Division. This rule does not require a licensee to transfer any device received under a general license to the licensee's specific license.

Aggregate Cost Information

7. Aggregate anticipated cost or savings to:

A) State budget:

Affected: ○ No ● Yes

The Division currently manages a specific licensing program and a general license program. A specific license is issued to an individual that contains specific requirements regarding the use of radioactive material by the individual. The individual must apply for and obtain the specific license prior to receiving radioactive material. A general license is issued by rule to anyone obtaining devices containing radioactive material that have been distributed to the licensee under certain conditions and requirements. After receiving the devices, the general licensee must register each device with the Division, and pay the annual fee of $20 per general license. The Division inspects specific and general licensees' compliance with the rules at specific intervals. Whenever possible, Division inspectors combine the inspection of devices licensed under the specific and general licenses held by the same licensee. However, there are times when Division inspectors travel to the same facility to perform the specific and general license inspections separately. There are currently 15 licensees with both a specific license and a general license that are regulated by the Division. If all of these licensees transferred their generally licensed devices to their specific licenses, the Division would not receive $300 per year in registration fees (General Fund revenues). However, the Division would no longer have data entry work to enter and remove each of these devices as the licensee received new devices or transferred/disposed of old devices. The Division would not have to generate and issue a separate general license registration certificate, send out revised certificates to the licensees as the licensees' device inventory changes, nor generate additional paperwork associated with a separate inspection of the devices. Also, there would be no need to visit the licensees' facilities more frequently than the specific license inspection frequency. While it is hard to estimate the actual cost savings to the Division, it is reasonable to assume that the Division would save more than $300 per year from the decreased registration and inspection activities associated with these licensees.

B) Local government:

Affected: ● No ○ Yes

Local governments would not be impacted fiscally since they are not involved in the regulation of general or specific radioactive material licenses. Also, none of the entities with both a specific license and a general license are local government agencies.

C) Small businesses:

Affected: ● No ○ Yes

("small business" means a business employing fewer than 50 persons)

There is no anticipated fiscal affect on small businesses from the proposed rule changes, except for small businesses that possess both a specific license and a general license. The impact on affected small businesses is addressed in Item 8 of this form "Compliance costs for affected persons."

D) Persons other than small businesses, businesses, or local government entities:

Affected: ● No ○ Yes

("person" means any individual, partnership, corporation, association, governmental entity, or public or private organization of any character other than an agency)

There is no anticipated fiscal affect on other persons from the proposed rule changes, except for

Compliance Cost Information

8. Compliance costs for affected persons:
For those affected persons transferring devices possessed under their general license to their specific license, there will be an initial cost associated with changing the labeling on each device to conform with the labeling of devices possessed under a specific license, and the affected person will have to report the transfer of the devices to the Division. The affected person can modify the device labels himself, or the affected person can employ a service technician to perform this work. In those cases where the specific license will need to be amended prior to transferring the devices, the affected person will have to prepare and submit an amendment request to the Division. The costs associated with these actions are anticipated to be one-time expenses. Since each affected person will deal with these expenses in a unique manner, it is difficult to estimate the total cost to persons affected by this rule, but it is expected that the costs will be minimal for each affected person. Also, affected persons are not required to transfer devices from their general license to their specific license by the proposed rule change. Affected persons may have additional costs associated with required sealed source leak testing (for any contamination), physical inventories, and shutter checks; however, most of these required activities are likely to occur at the same frequency for the devices regardless of the license type. Affected persons who transfer all of their devices to a specific license will save $20 per year in general license fees, and the affected persons will no longer incur expenses associated with reporting inventory changes to the Division as required for devices under a general license.

Department Head Comments

9. A) Comments by the department head on the fiscal impact the rule may have on businesses:
The proposed changes to the rule are necessary for the Utah Radiation Control Rules to be compatible with NRC requirements, and the Division's program activities are adequate to protect the public health and safety. While there may be a small cost incurred by businesses opting to transfer devices containing radioactive material from a general license to a specific license, it is believed that businesses will benefit from the reduced on-going regulatory expenses and a simplified regulatory process by having only one license with the Division.
B) Name and title of department head commenting on the fiscal impacts:
Amanda Smith, Executive Director

Citation Information

10. This rule change is authorized or mandated by state law, and implements or interprets the following state and federal laws.
State code or constitution citations (required) (e.g., Section 63G-3-402; Subsection 63G-3-601(3); Article IV) :
Sections 19-3-104(4) and 19-3-104(8)

Incorporated Materials

11. This rule adds, updates, or removes the following title of materials incorporated by references (a copy of materials incorporated by reference must be submitted to DAR; if none, leave blank) :

Official Title of Materials Incorporated (from title page)
Publisher
Date Issued
Issue, or version
ISBN Number
ISSN Number
Cost of Incorporated Reference
Adds, updates, removes-- SELECT ONE --

Comments

12. The public may submit written or oral comments to the agency identified in box 1. (The public may also request a hearing by submitting a written request to the agency. The agency is required to hold a hearing if it receives requests from ten interested persons or from an association having not fewer than ten members. Additionally, the request must be received by the agency not more than 15 days after the publication of this rule in the Utah State Bulletin. See Section 63G-3-302 and Rule R15-1 for more information.)

A) Comments will be accepted until 5:00 p.m. on (mm/dd/yyyy) : 05/31/2010

B) A public hearing (optional) will be held:

On (mm/dd/yyyy): At (hh:mm AM/PM): At (place):

Proposed Effective Date

13. This rule change may become effective on (mm/dd/yyyy): 06/09/2010

NOTE: The date above is the date on which this rule MAY become effective. It is NOT the effective date. After the date designated in Box 12(A) above, the agency must submit a Notice of Effective Date to the Division of Administrative Rules to make this rule effective. Failure to submit a Notice of Effective Date will result in this rule lapsing and will require the agency to start the rulemaking process over.

Indexing Information

14. Indexing information - keywords (maximum of four, one term per field, in lower case, except for acronyms (e.g., "GRAMA") or proper nouns (e.g., "Medicaid")):
radioactive material, general license, source material

File Information

15. Attach an RTF document containing the text of this rule change (filename):
There is a document associated with this rule filing.

To the Agency

Information requested on this form is required by Sections 63G-3-301, 302, 303, and 402. Incomplete forms will be returned to the agency for completion, possibly delaying publication in the Utah State Bulletin, and delaying the first possible effective date.

Agency Authorization

Agency head or designee, and title:	Dane Finerfrock Director	Date (mm/dd /yyyy): 04/01/2010

R313. Environmental Quality, Radiation Control.
R313-21. General Licenses.
R313-21-22. General Licenses*--Radioactive Material Other Than Source Material.

NOTE: *Different general licenses are issued in this section, each of which has its own specific conditions and requirements.

(1) Certain devices and equipment. A general license is hereby issued to transfer, receive, acquire, own, possess, and use radioactive material incorporated in the following devices or equipment which have been manufactured, tested and labeled by the manufacturer in accordance with a specific license issued to the manufacturer by the Executive Secretary, the Nuclear Regulatory Commission, an Agreement State, or a Licensing State for use pursuant to 10 CFR 31.3. This general license is subject to the provisions of R313-12-51 through R313-12-70, R313-14, R313-15, R313-18 and R313-19 as applicable.

(a) Static Elimination Devices. Devices designed for use as static eliminators which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 18.5 megabecquerel (500 uCi) of polonium-210 per device.

(b) Ion Generating Tube. Devices designed for ionization of air which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 18.5 megabecquerel (500 uCi) of polonium-210 per device or a total of not more than 1.85 gigabecquerel (50 mCi) of hydrogen-3 (tritium) per device.

(2) RESERVED.

(3) RESERVED.

(4) Certain detecting, measuring, gauging or controlling devices and certain devices for producing light or an ionized atmosphere.*

NOTE: *Persons possessing radioactive material in devices under a general license in R313-21-22(4) before January 15, 1975, may continue to possess, use, or transfer that material in accordance with the labeling requirements of R313-21-22(4) in effect on January 14, 1975.

(a) A general license is hereby issued to commercial and industrial firms and research, educational and medical institutions, individuals in the conduct of their business, and state or local government agencies to own, acquire, receive, possess, use or transfer, in accordance with the provisions of R313-21-22(4)(b), (c) and (d), radioactive material, excluding special nuclear material, contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere.

(b)(i) The general license in R313-21-22(4)(a) applies only to radioactive material contained in devices which have been manufactured or initially transferred and labeled in accordance with the specifications contained in:

(A) a specific license issued by the Executive Secretary pursuant to R313-22-75(4); or

(B) an equivalent specific license issued by the Nuclear Regulatory Commission, an Agreement State or a Licensing State.*

NOTE: *Regulations under the Federal Food, Drug, and Cosmetic Act authorizing the use of radioactive control devices in food production require certain additional labeling thereon which is found in 21 CFR 179.21.

(ii) The devices must have been received from one of the specific licensees described in R313-21-22(4)(b)(i) or through a transfer made under R313-21-22(4)(c)(ix).

(c) Any person who owns, acquires, receives, possesses, uses or transfers radioactive material in a device pursuant to the general license in R313-21-22(4)(a):

(i) shall assure that all labels affixed to the device at the time of receipt and bearing a statement that removal of the label is prohibited are maintained thereon and shall comply with all instructions and precautions provided by the labels;

(ii) shall assure that the device is tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at no longer than six-month intervals or at other intervals as are specified in the label; however:

(A) Devices containing only krypton need not be tested for leakage of radioactive material, and

(B) Devices containing only tritium or not more than 3.7 megabecquerel (100 uCi) of other beta, gamma, or both, emitting material or 0.37 megabecquerel (10 uCi) of alpha emitting material and devices held in storage in the original shipping container prior to initial installation need not be tested for any purpose;

(iii) shall assure that other testing, installation, servicing, and removal from installation involving the radioactive materials, its shielding or containment, are performed:

(A) in accordance with the instructions provided by the labels; or

(B) by a person holding a specific license pursuant to R313-22 or from the Nuclear Regulatory Commission, an Agreement State, or a Licensing State to perform such activities;

(iv) shall maintain records showing compliance with the requirements of R313-21-22(4)(c)(ii) and (iii). The records shall show the results of tests. The records also shall show the dates of performance of, and the names of persons performing, testing, installation, servicing, and removal from the installation the radioactive material and its shielding or containment. The licensee shall retain these records as follows:

(A) Each record of a test for leakage [~~or~~]<u>of</u> radioactive material required by R313-21-22(4)(c)(ii) shall be retained for three years after the next required leak test is performed or until the sealed source is transferred or disposed of;

(B) Each record of a test of the on-off mechanism and indicator required by R313-21-22(4)(c)(ii) shall be retained for three years after the next required test of the on-off mechanism and indicator is performed or until the sealed source is transferred or disposed of;

(C) Each record that is required by R313-21-22(4)(c)(iii) shall be retained for three years from the date of the recorded

event or until the device is transferred or disposed of;

(v) shall immediately suspend operation of the device if there is a failure of, or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive material or the on-off mechanism or indicator, or upon the detection of 185 becquerel (0.005 uCi) or more removable radioactive material. The device may not be operated until it has been repaired by the manufacturer or other person holding a specific license to repair the device that was issued by the Executive Secretary, the Nuclear Regulatory Commission, an Agreement State, or a Licensing State. The device and any radioactive material from the device may only be disposed of by transfer to a person authorized by a specific license to receive the radioactive material in the device or as otherwise approved by the Executive Secretary, the Nuclear Regulatory Commission, an Agreement State, or a Licensing State. A report containing a brief description of the event and the remedial action taken; and, in the case of detection of 185 becquerel (0.005 uCi) or more removable radioactive material or failure of or damage to a source likely to result in contamination of the premises or the environs, a plan for ensuring that the premises and environs are acceptable for unrestricted use, must be furnished to the Executive Secretary within 30 days. Under these circumstances, the criteria set out in R313-15-402 may be applicable, as determined by the Executive Secretary on a case-by-case basis;

(vi) shall not abandon the device containing radioactive material;

(vii) shall not export the device containing radioactive materials except in accordance with 10 CFR 110;

(viii)(A) shall transfer or dispose of the device containing radioactive material only by export as provided by R313-21-22(4)(c)(vii), by transfer to another general licensee as authorized in R313-21-22(4)(c)(ix), to a person authorized to receive the device by a specific license issued under R313-22, to an authorized waste collector under R313-25, or equivalent regulations of the Nuclear Regulatory Commission, an Agreement State, or a Licensing State , or as otherwise approved under R313-21-22(4)(c)(viii)(C);

(B) shall furnish a report to the Executive Secretary within 30 days after transfer of a device to a specific licensee or export. The report must contain:

(I) the identification of the device by manufacturer's or initial transferor's name, model number, and serial number;

(II) the name, address, and license number of the person receiving the device, the license number is not applicable if exported; and

(III) the date of the transfer;

(C) shall obtain written approval from the Executive Secretary before transferring the device to any other specific licensee not specifically identified in R313-21-22(4)(c)(viii)(A); <u>however, a holder of a specific license may transfer a device for possession and use under its own specific license without prior approval, if, the holder:</u>

(I) verifies that the specific license authorizes the possession and use, or applies for and obtains an amendment to the license authorizing the possession and use;

(II) removes, alters, covers, or clearly and unambiguosly augments the existing label (otherwise required by R313-21-22(4)(c)(i)) so that the device is labeled in compliance with R313-15-904; however, the manufacturer, model number, and serial number must be retained;

(III) obtains the manufacturer's or initial transferor's information concerning maintenance that would be applicable under the specific license (such as leak testing procedures); and

(IV) reports the transfer under R313-21-22(4)(c)(viii)(B);

(ix) shall transfer the device to another general licensee only if:

(A) the device remains in use at a particular location. In this case, the transferor shall give the transferee a copy of R313-21-22(4), R313-12-51, R313-15-1201, and R313-15-1202, and any safety documents identified in the label of the device. Within 30 days of the transfer, the transferor shall report to the Executive Secretary:

(I) the manufacturer's or initial transferor's name;

(II) the model number and serial number of the device transferred;

(III) the transferee's name and mailing address for the location of use; and

(IV) the name, title, and phone number of the responsible individual identified by the transferee in accordance with R313-21-22(4)(c)(xii) to have knowledge of and authority to take actions to ensure compliance with the appropriate regulations and requirements; or

(B) the device is held in storage by an intermediate person in the original shipping container at its intended location of use prior to initial use by a general licensee;

(x) shall comply with the provisions of R313-15-1201 and R313-15-1202 for reporting radiation incidents, theft or loss of licensed material, but shall be exempt from the other requirements of R313-15 and R313-18;

(xi) shall respond to written requests from the Executive Secretary to provide information relating to the general license within 30 calendar days of the date of the request, or other time specified in the request. If the general licensee cannot provide the requested information within the allotted time, it shall, within that same time period, request a longer period to supply the information by submitting a letter to the Executive Secretary and provide written justification as to why it cannot comply;

(xii) shall appoint an individual responsible for having knowledge of the appropriate regulations and requirements and the authority for taking required actions to comply with appropriate regulations and requirements. The general licensee, through this individual, shall ensure the day-to-day compliance with appropriate regulations and requirements. This appointment does not relieve the general licensee of any of its responsibility in this regard;

(xiii)(A) shall register, in accordance with R313-21-22(4)(c)(xiii)(B) and (C), devices containing at least 370 megabecquerel (ten mCi) of cesium-137, 3.7 megabecquerel (0.1 mCi) of strontium-90, 37 megabecquerel (one mCi) of cobalt-60, 3.7 megabecquerel (0.1 mCi) of radium-226, or 37 megabecquerel (one mCi) of americium-241 or any other transuranic, (elements with atomic number greater than uranium-92), based on the activity indicated on the label. Each address for a location of use, as described under R313-21-22(4)(c)(xiii)(C)(IV) represents a separate general licensee and requires a separate registration and fee;

(B) if in possession of a device meeting the criteria of R313-21-22(4)(c)(xiii)(A), shall register these devices annually with the Executive Secretary and shall pay the fee required by R313-70. Registration shall include verifying, correcting, or adding, as appropriate, to the information provided in a request for registration received from the Executive Secretary. The registration information must be submitted to the Executive Secretary within 30 days of the date of the request for registration or as otherwise indicated in the request. In addition, a general licensee holding devices meeting the criteria of R313-21-22(4)(c)(xiii)(A) is subject to the bankruptcy notification requirement in R313-19-34(5) and (6);

(C) in registering devices, the general licensee shall furnish the following information and any other information specifically requested by the Executive Secretary:

(I) name and mailing address of the general licensee;

(II) information about each device: the manufacturer or initial transferor, model number, serial number, the radioisotope and activity as indicated on the label;

(III) name, title, and telephone number of the responsible person designated as a representative of the general licensee under R313-21-22(4)(c)(xii);

(IV) address or location at which the device(s) are used, stored, or both. For portable devices, the address of the primary place of storage;

(V) certification by the responsible representative of the general licensee that the information concerning the device(s) has been verified through a physical inventory and checking of label information; and

(VI) certification by the responsible representative of the general licensee that they are aware of the requirements of the general license; and

(D) persons generally licensed by the Nuclear Regulatory Commission, an Agreement State, or Licensing State with respect to devices meeting the criteria in R313-21-22(4)(c)(xiii)(A) are not subject to registration requirements if the devices are used in areas subject to Division jurisdiction for a period less than 180 days in any calendar year. The Executive Secretary will not request registration information from such licensees;

(xiv) shall report changes to the mailing address for the location of use, including changes in the name of a general licensee, to the Executive Secretary within 30 days of the

effective date of the change. For a portable device, a report of address change is only required for a change in the device's primary place of storage; and

(xv) may not hold devices that are not in use for longer than 2 years. If devices with shutters are not being used, the shutter must be locked in the closed position. The testing required by R313-21-22(4)(c)(ii) need not be performed during the period of storage only. However, when devices are put back into service or transferred to another person, and have not been tested within the required test interval, they must be tested for leakage before use or transfer and the shutter tested before use. Devices kept in standby for future use are excluded from the two-year time limit if the general licensee performs quarterly physical inventories of these devices while they are in standby.

(d) The general license in R313-21-22(4)(a) does not authorize the manufacture or import of devices containing radioactive material.

(e) The general license provided in R313-21-22(4)(a) is subject to the provisions of R313-12-51 through R313-12-53, R313-12-70, R313-14, R313-19-34, R313-19-41, R313-19-61, and R313-19-100.

(5) Luminous safety devices for aircraft.

(a) A general license is hereby issued to own, receive, acquire, possess and use tritium or promethium-147 contained in luminous safety devices for use in aircraft, provided:

(i) each device contains not more than 370.0 gigabecquerel (10 Ci) of tritium or 11.1 gigabecquerel (300 mCi) of promethium-147; and

(ii) each device has been manufactured, assembled or initially transferred in accordance with a specific license issued by the Nuclear Regulatory Commission or an Agreement State, or each device has been manufactured or assembled in accordance with the specifications contained in a specific license issued by the Executive Secretary or an Agreement State to the manufacturer or assembler of the device pursuant to licensing requirements equivalent to those in R313-22-75(5).

(b) Persons who own, receive, acquire, possess or use luminous safety devices pursuant to the general license in R313-21-22(5) are exempt from the requirements of R313-15 and R313-18, except that they shall comply with the provisions of R313-15-1201 and R313-15-1202.

(c) This general license does not authorize the manufacture, assembly, repair, or import of luminous safety devices containing tritium or promethium-147.

(d) This general license does not authorize the export of luminous safety devices containing tritium or promethium-147.

(e) This general license does not authorize the ownership, receipt, acquisition, possession or use of promethium-147 contained in instrument dials.

(f) This general license is subject to the provisions of R313-12-51 through R313-12-70, R313-14, R313-19-34, R313-19-41, R313-19-61, and R313-19-100.

(6) Ownership of radioactive material. A general license is

hereby issued to own radioactive material without regard to quantity. Notwithstanding any other provisions of R313-21, this general license does not authorize the manufacture, production, transfer, receipt, possession, use, import, or export of radioactive material except as authorized in a specific license.

(7) Calibration and reference sources.

(a) A general license is hereby issued to own, receive, acquire, possess, use and transfer, in the form of calibration or reference sources, americium-241, plutonium or radium-226 in accordance with the provisions of R313-21-22(7)(b) and (c), to a person who holds a specific license issued by the Executive Secretary which authorizes that person to receive, possess, use and transfer radioactive material.

(b) The general license in R313-21-22(7)(a) applies only to calibration or reference sources which have been manufactured or initially transferred in accordance with the specifications contained in a specific license issued to the manufacturer or importer of the sources by the Nuclear Regulatory Commission pursuant to 10 CFR 32.57 or 10 CFR 70.39 or which have been manufactured in accordance with the specifications contained in a specific license issued to the manufacturer by the Executive Secretary, a Licensing State, or an Agreement State in accordance with requirements equivalent to 10 CFR 32.57 or 10 CFR 70.39.

(c) The general license provided in R313-21-22(7)(a) is subject to the provisions of R313-12-51 through R313-12-53, R313-12-70, R313-14, R313-19-34, R313-19-41, R313-19-61, R313-19-100, R313-15 and R313-18. In addition, persons who own, receive, acquire, possess, use or transfer one or more calibration or reference sources pursuant to these general licenses:

(i) shall not possess at any one time, at any one location of storage or use, more than 185.0 kilobecquerel (5 uCi) of americium-241, 185.0 kilobecquerel (5 uCi) of plutonium, or 185.0 kilobecquerel (5 uCi) of radium-226 in such source;

(ii) shall not receive, possess, use or transfer a source unless the source, or the storage container, bears a label which includes one of the following statements or a substantially similar statement which contains the information called for in the following statement:

The receipt, possession, use and transfer of this source, Model No. ....., Serial No. ....., are subject to a general license and the regulations of the United States Nuclear Regulatory Commission or of a state with which the Commission has entered into an agreement for the exercise of regulatory authority. Do not remove this label.

CAUTION - RADIOACTIVE MATERIAL

THIS SOURCE CONTAINS (AMERICIUM-241)(PLUTONIUM)(RADIUM-226)*

DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.

.....

Typed or printed name of the manufacturer or initial transferor

NOTE: *Show the name of the appropriate material.

(iii) shall not transfer, abandon, or dispose of a source except by transfer to a person authorized by a license from the

Executive Secretary, the Nuclear Regulatory Commission, an Agreement State, or a Licensing State to receive the source;

(iv) shall store a source, except when the source is being used, in a closed container adequately designed and constructed to contain americium-241, plutonium, or radium-226 which might otherwise escape during storage; and

(v) shall not use a source for any purpose other than the calibration of radiation detectors or the standardization of other sources.

(f) These general licenses do not authorize the manufacture, import, or export of calibration or reference sources containing americium-241, plutonium, or radium-226.

(8) RESERVED.

(9) General license for use of radioactive material for certain in vitro clinical or laboratory testing.*

NOTE: *The New Drug provisions of the Federal Food, Drug and Cosmetic Act also govern the availability and use of any specific diagnostic drug in interstate commerce.

(a) A general license is hereby issued to any physician, veterinarian in the practice of veterinary medicine, clinical laboratory or hospital to receive, acquire, possess, transfer or use, for the following stated tests, in accordance with the provisions of R313-21-22(9) (b), (c), (d), (e), and (f) the following radioactive materials in prepackaged units for use in in-vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals:

(i) iodine-125, in units not exceeding 370.0 kilobecquerel (10 uCi) each;

(ii) iodine-131, in units not exceeding 370.0 kilobecquerel (10 uCi) each;

(iii) carbon-14, in units not exceeding 370.0 kilobecquerel (10 uCi) each;

(iv) hydrogen-3 (tritium), in units not exceeding 1.85 megabecquerel (50 uCi) each;

(v) iron-59, in units not exceeding 740.0 kilobecquerel (20 uCi) each;

(vi) cobalt-57, in units not exceeding 370.0 kilobecquerel (10 uCi) each;

(vii) selenium-75, in units not to exceed 370.0 kilobecquerel (10 uCi) each; or

(viii) mock iodine-125, reference or calibration sources, in units not exceeding 1.85 kilobecquerel (0.05 uCi) of iodine-129 and 185.0 becquerel (0.005 uCi) of americium-241 each.

(b) A person shall not receive, acquire, possess, use or transfer radioactive material pursuant to the general license established by R313-21-22(9)(a) until that person has filed form DRC-07, "Registration Form-In Vitro Testing with Radioactive Material Under General License," with the Executive Secretary and received a Certificate of Registration signed by the Executive Secretary, or until that person has been authorized pursuant to R313-32 to use radioactive material under the general license in R313-21-22(9). The physician, veterinarian, clinical laboratory

or hospital shall furnish on form DRC-07 the following information and other information as may be required by that form:

(i) name and address of the physician, veterinarian, clinical laboratory or hospital;

(ii) the location of use; and

(iii) a statement that the physician, veterinarian, clinical laboratory or hospital has appropriate radiation measuring instruments to carry out in vitro clinical or laboratory tests with radioactive material as authorized under the general license in R313-21-22(9)(a) and that the tests will be performed only by personnel competent in the use of radiation measuring instruments and in the handling of the radioactive material.

(c) A person who receives, acquires, possesses or uses radioactive material pursuant to the general license established by R313-21-22(9)(a) shall comply with the following:

(i) The general licensee shall not possess at any one time, pursuant to the general license in R313-21-22(9)(a) at any one location of storage or use, a total amount of iodine-125, iodine-131, selenium-75, iron-59, cobalt-57, or any combination, in excess of 7.4 megabecquerel (200 uCi).

(ii) The general licensee shall store the radioactive material, until used, in the original shipping container or in a container providing equivalent radiation protection.

(iii) The general licensee shall use the radioactive material only for the uses authorized by R313-21-22(9)(a).

(iv) The general licensee shall not transfer the radioactive material except to a person authorized to receive it pursuant to a license issued by the Executive Secretary, the Nuclear Regulatory Commission, an Agreement State or Licensing State, nor transfer the radioactive material in a manner other than in the unopened, labeled shipping container as received from the supplier.

(v) The general licensee shall dispose of the Mock Iodine-125 reference or calibration sources described in R313-21-22(9)(a)(viii) as required by R313-15-1001.

(vi) The general licensee shall pay annual fees pursuant to R313-70.

(d) The general licensee shall not receive, acquire, possess, or use radioactive material pursuant to R313-21-22(9)(a):

(i) Except as prepackaged units which are labeled in accordance with the provision of a specific license issued pursuant to R313-22-75([~~8~~]7) or in accordance with the provisions of a specific license issued by the Nuclear Regulatory Commission, an Agreement State, or a Licensing State which authorizes the manufacture and distribution of iodine-125, iodine-131, carbon-14, hydrogen-3(tritium), iron-59, selenium-75, cobalt-57, or Mock Iodine-125 to persons generally licensed under R313-22(9) or its equivalent, and

(ii) Unless the following statement, or a substantially similar statement which contains the information called for in the following statement, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

"This radioactive material shall be received, acquired,

possessed and used only by physicians, veterinarians in the practice of veterinary medicine, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use and transfer are subject to the regulations and a general license of the United States Nuclear Regulatory Commission or of a state with which the Commission has entered into an agreement for the exercise of regulatory authority.

.....

Name of Manufacturer"

(e) The physician, veterinarian, clinical laboratory or hospital possessing or using radioactive material under the general license in R313-21-22(9)(a) shall report in writing to the Executive Secretary, changes in the information previously furnished in the "Registration Form-In Vitro Testing with Radioactive Material Under General License", form DRC -07. The report shall be furnished within 30 days after the effective date of the change.

(f) Any person using radioactive material pursuant to the general license of R313-21-22(9)(a) is exempt from the requirements of R313-15 and R313-18 with respect to radioactive material covered by that general license, except that persons using the Mock Iodine-125 described in R313-21-22(9)(a)(viii) shall comply with the provisions of R313-15-1001, R313-15-1201 and R313-15-1202.

(10) Ice Detection Devices.

(a) A general license is hereby issued to own, receive, acquire, possess, use and transfer strontium-90 contained in ice detection devices, provided each device contains not more than 1.85 megabecquerel (50 uCi) of strontium-90 and each device has been manufactured or initially transferred in accordance with a specific license issued by the Nuclear Regulatory Commission, or each device has been manufactured in accordance with the specifications contained in a specific license issued by the Executive Secretary, an Agreement State, or a Licensing State to the manufacturer of the device pursuant to licensing requirements equivalent to those in 10 CFR 32.61.

(b) Persons who own, receive, acquire, possess, use or transfer strontium-90 contained in ice detection devices pursuant to the general license in R313-21-22(10)(a):

(i) shall, upon occurrence of visually observable damage, such as a bend or crack or discoloration from over-heating to the device, discontinue use of the device until it has been inspected, tested for leakage and repaired by a person holding a specific license from the Executive Secretary, the Nuclear Regulatory Commission, an Agreement State, or a Licensing State to manufacture or service the device; or shall dispose of the device pursuant to the provisions of R313-15-1001;

(ii) shall assure that all labels affixed to the device at the time of receipt, and which bear a statement which prohibits removal of the labels, are maintained thereon; and

(iii) are exempt from the requirements of R313-15 and R313-18 except that the persons shall comply with the provisions of R313-15-1001, R313-15-1201 and R313-15-1202.

(c) This general license does not authorize the manufacture, assembly, disassembly, repair, or import of strontium-90 in ice detection devices.

(d) This general license is subject to the provision of R313-12-51 through R313-12-53, R313-12-70, R313-14, R313-19-34, R313-19-41, R313-19-61, and R313-19-100 of these rules.

KEY: radioactive materials, general licenses, source materials
Date of Enactment or Last Substantive Amendment: [~~February 11, 2009~~]June 9, 2010
Notice of Continuation: October 14, 2008
Authorizing, and Implemented or Interpreted Law: 19-3-104

III. Radioactive Materials Licensing/Inspection

b. Proposed Amendment to R313-34, "Requirements for Irradiators" (Board Action Items)

UTAH RADIATION CONTROL RULES

BOARD ACTION ITEM

Requirements for Irradiators (R313-34)

During the February 9, 2010 Board meeting, Mr. Craig Jones informed the Board that during the process of completing a five year review of Rule R313-34, Requirements for Irradiators, it was noted that the rule incorporated by reference portions of the 2001 edition of the Code of Federal Regulations. It was proposed that the rule be amended to update the incorporated material to the 2010 edition of the Code of Federal Regulations (specifically 10 CFR 36). Mr. Jones referred the Board to the proposed change as it was identified in the board packet. The change consists of a singular change. The change from the year 2001 to 2010 is documented in the first sentence of R313-34-3.

The Executive Secretary recommended that the Board approve a filing of the proposed change with the Division of Administrative Rules, and the Board establish a 30-day period for public comments. A motion was proposed and passed by the Board to do so.

The Proposed Rule Amendment change, DAR No. 33368, was submitted to the Division of Administrative Rules on February 10, 2010. The 30-day public comment period began on March 1, 2010 and ended on March 31, 2010. The Executive Secretary did not receive any comments.

Recommendation

The Executive Secretary recommends that the Board approve the proposed rule with an effective date of April 15, 2010.

V. Radioactive Waste Disposal

a. Effective date for the Depleted Uranium Rule, R313-25-8 (Board Action Item)

RESPONSE TO COMMENTS REGARDING
PROPOSED AMENDMENTS TO UTAH ADMIN. CODE R313-25-8 TO ADDRESS DEPLETED URANIUM
April 5, 2010

The Executive Secretary provides the following responses to public comments received during the public comment period (January 1, 2010 to February 2, 2010) regarding proposed changes to R313-25-8 to set forth a specific performance assessment requirement for disposal of depleted uranium. The rule is set forth as it was proposed on January 1, 2010, in Attachment 1. The rule as it now being recommended to the Board is set forth in Attachment 2. The difference between the two versions is discussed in Part B below.

A. Background – What is the Proposed Rule About and Why Has it Been Proposed?

The Statement of Basis for Administrative Rulemaking Regarding Disposal of Significant Quantities of Depleted Uranium (December 1, 2009) (Statement of Basis), as set forth in Attachment 3, describes the purpose of the Proposed Rule and the Board's authority to conduct this rulemaking. In summary, the Proposed Rule would require a licensee proposing to dispose of significant quantities of depleted uranium to submit a performance assessment and to have that performance assessment approved prior to disposal. The purpose of the performance assessment would be to demonstrate that the facility will meet the U.S. Nuclear Regulatory Commission's (NRC's) Performance Objectives for land disposal of radioactive waste if the depleted uranium is disposed of as proposed. The NRC has recommended that evaluation occur prior to the disposal of significant quantities of depleted uranium.

NRC's Performance Objectives are found at 10 CFR §§ 61.40 through 61.44. They are short narrative standards regarding the protection of the general population from releases of radioactivity, protection of individuals from inadvertent intrusion, protection of individuals during operations, and stability of the disposal site after closure. Other regulatory provisions, NRC guidance and professional judgment are used to ensure that NRC's Performance Objectives are met. The full text of NRC's Performance Objectives is set forth in Attachment 4.[1]

In order to understand why this rule has been proposed, it is necessary first to understand NRC's low-level radioactive waste classification system.[2] Although a site-specific performance assessment could have been done for every kind of radioactive waste proposed to be disposed of at every land disposal facility, the NRC elected to take a different, more efficient approach. In

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[1] Agreement states like Utah must have rules that are equivalent to NRC's Performance Objectives. Utah's rules regarding performance objectives are found at Utah Admin. Code R313-25-18 through 22.

[2] The following information is a summary of information that was already provided in the Statement of Basis, and in the documents incorporated therein. *See* Attachment 3.

the early 1980s, it did a generic performance assessment to establish the conditions under which there was reasonable assurance that its Performance Objectives would be met for different kinds and concentrations of low-level radioactive waste, and at facilities with different kinds of environmental conditions. NRC used the results of that assessment to classify different kinds and concentrations of waste into four categories, each with different disposal requirements defined by the kinds of restrictions that would be required to dispose of the waste: Class A, B, C and Greater-than-Class C. Class A is the least restrictive category, and Greater-than-Class C is the greatest. Although there are other requirements that apply to any waste being disposed, the requirements associated with the waste's classification form the foundation of the applicable requirements for nearly all low-level radioactive wastes.

Depleted uranium is different from other low-level radioactive wastes, however. Because significant quantities of depleted uranium were not anticipated at the time NRC's generic classification performance assessment was completed, that assessment did not analyze the performance of the disposal of significant quantities of depleted uranium at land disposal facilities. Nor was the appropriate classification of significant quantities of depleted uranium evaluated.[3] For these reasons, waste classification cannot serve as the regulatory foundation for disposal of depleted uranium as it does for other radioactive wastes.

After studying this matter, the NRC decided to turn instead to another of its regulatory tools, the performance assessment. It is in the process of developing a regulation that will require a facility proposing to dispose of significant quantities of depleted uranium to first conduct a performance assessment. In the interim, before that regulation is adopted, NRC has also recommended that disposal facility operators and Agreement state regulators review performance assessments to ensure that Performance Objective are being met. NRC also provided new, interim guidance about how to do a performance assessment.

This rule requiring a performance assessment for disposal of significant quantities of depleted uranium is proposed in order to ensure that NRC's Performance Objectives will be met for disposal of significant quantities of depleted uranium. In the absence of such a performance assessment, the agency cannot have reasonable assurance that performance objectives will be met.

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[3] Depleted uranium's status as a Class A waste is by operation of 10 CFR § 61.55(a)(6), which states that any wastes that are not specifically addressed in NRC's waste classification regulation will be considered Class A waste. It was not at that time a result of an affirmative decision that the restrictions for Class A waste are sufficient to ensure the safe disposal of significant quantities of depleted uranium. The NRC has since concluded that it will not change the classification of depleted uranium at this time – although it may do so in the future – but will instead require an approved performance assessment to ensure that the facility meets NRC Performance Objectives.

B. Changes in the Proposed Rule

1. In order to avoid confusion over the use of duplicate terms, the NRC has recommended that the term "depleted uranium" as defined in R313-25-8(2)(c) of the Proposed Rule and as used throughout R313-25-8(2) be changed to "concentrated depleted uranium." The Executive Secretary concurs in this recommendation and has prepared a proposed rule change for the Board's consideration.

2. Several commenters felt that this language in the Proposed Rule, R313-25-8(2)(a) was confusing:

> "Additional simulations will be performed for a qualitative analysis for the period where peak dose occurs."

They noted that simulations cannot be qualitative, so it was unclear how this analysis would proceed. The Executive Secretary agrees that it would be helpful to clarify this language and is proposing instead:

> "Additional simulations shall be performed for a qualitative analysis for the period where peak dose occurs and the results shall be analyzed qualitatively."

3. Finally, "will" has been changed to "shall" in this portion of the rule for purposes of consistency and because the latter is more commonly used in regulatory language.

C. Stringency of the Rule – Applicability

1. The Proposed Rule is not more stringent than corresponding federal regulations.

a. All licensees are already required to meet performance objectives for disposal of all wastes:

> R313-25-18. General Requirement.
> Land disposal facilities shall be sited, designed, operated, closed, and controlled after closure so that reasonable assurance exists that exposures to individuals do not exceed the limits stated in R313-25-19 and 25-22.

The Proposed Rule simply clarifies and codifies, for depleted uranium, what will be necessary to demonstrate that those standards are met. Any rule may be enforced by order under Utah Code Ann. § 19-3-108(2)(c)(iii).

Because existing rules allow the agency to require compliance before disposal where there is an unanalyzed condition, the Proposed Rule is therefore not more stringent.

b. The Proposed Rule, generally, adopts a procedure for ensuring that existing standards are met. With one exception, it does not specify any standard and so does not impose standards that are more or less stringent than federal law.

The one exception is that the rule does specify a 10,000 year minimum time period as a performance period. Because the performance period is not specified in either federal or Utah law, there is no comparable federal regulation and the stringency provisions of Utah Code Ann. § 19-3-104(8) do not apply.

The determination about the period of performance lies within the discretion of both the NRC and the Division of Radiation Control (DRC) since both are required to determine an appropriate performance period anytime they review a performance assessment. The agencies, therefore, already have authority to make this determination so, again, the requirement is not more stringent.

c. The Proposed Rule is not more stringent than federal rules because there are no "corresponding federal regulations which address the same circumstances." Utah Code Ann. § 19-3-104(8)(a). Specifically, there is no federal regulation governing how or when a performance assessment can be required generally, or specifically with respect to disposal of depleted uranium. Because there is no comparable federal regulation, the stringency provisions of Utah Code Ann. § 19-3-104(8) and (9) do not apply.

d. These analyses do not change because the Licensee is required under the Proposed Rule to comply prior to disposal. The Proposed Rule imposes the same kind of restriction that is found in countless regulatory and license requirements to which any licensee is subject: it requires that before the licensee can undertake an activity, it must demonstrate that activity is safe. This is the normal regulatory process, not a moratorium. The timing of the submission of a performance assessment is in the licensee's hands. (*See also* General Response to Comment No. 39, Comment No. 2 regarding timing of the performance assessment.)

2. In the event the rule is found to be more stringent, and specifically in the event the Division of Radiation Control is found to have the authority to require a performance assessment prior to disposal in order to assure that a licensee meets performance objectives, then the corresponding federal rules are not adequate to protect human health and the environment with respect to the disposal of depleted uranium because that disposal is an unanalyzed condition. *See* Part D.

D. Stringency of the Rule – Proposed Findings and Opinion

The Executive Secretary has submitted for the Board's consideration a draft finding and opinion, as required by Utah Code Ann. § 19-3-104(9)(b). *See* Attachment 5.

E. Discussion and Analysis Regarding Impact on Small Business

1. Applicability of Utah Code Ann. § 63G-3-301(6)

One commenter, Cavanagh Services Group, has alleged that it will be impacted by the Proposed Rule, and has quantified that impact in its comments. Cavanagh and EnergySolutions requested that the rule be sent back out for public comment with the analysis of methods of reducing the impact of the rule on small business required by Utah Code Ann. § 63G-3-301(6).

The Executive Secretary agrees that the Proposed Rule will impact Cavanagh, albeit indirectly. Because all of the analyses required by Utah Code Ann. § 63G-3-301(6) go to questions about whether direct impacts on small businesses can be reduced, however, the Executive Secretary reasonably concluded that section does not apply to indirect impacts, such as those alleged by Cavanagh. *See* analysis in Part E.3.

2. Remedy

In the event that the Executive Secretary's interpretation is in error, the remedy for failure to provide that analysis when rulemaking is proposed is provided in Utah Code Ann. § 63G-3-301(7):

> If during the public comment period an agency receives comment that the proposed rule will cost small business more than one day's annual average gross receipts, and the agency had not previously performed the analysis in Subsection (6), the agency shall perform the analysis described in Subsection (6).

The remedy, then, is to perform the analysis, not to send the rule back out to public comment. That analysis is provided in E.3.

3. Analysis

Utah Code provides:

> (6) If the agency reasonably expects that a proposed rule will have a measurable negative fiscal impact on small businesses, the agency shall consider, as allowed by federal law, each of the following methods of reducing the impact of the rule on small businesses:
> (a) establishing less stringent compliance or reporting requirements for small businesses;
> (b) establishing less stringent schedules or deadlines for compliance or reporting requirements for small businesses;
> (c) consolidating or simplifying compliance or reporting requirements for small businesses;
> (d) establishing performance standards for small businesses to replace design or

operational standards required in the proposed rule; and
(e) exempting small businesses from all or any part of the requirements contained in the proposed rule.

Utah Code Ann. § 63G-3-301(6).

(a) Would establishing less stringent compliance or reporting requirements for small businesses reduce the impact of the Proposed Rule on small business?

Response: It would not. Because there is no small business that is subject to any compliance or reporting requirements under the Proposed Rule, reducing those requirements for small business would not reduce the impact on small business.

(b) Would establishing less stringent schedules or deadlines for compliance or reporting requirements for small businesses reduce the impact of the Proposed Rule on small business?

Response: It would not. Because there is no small business that is subject to any compliance or reporting requirements under the Proposed Rule, establishing less stringent schedules or deadlines for compliance or reporting for small business would not reduce the impact on small business.

(c) Would consolidating or simplifying compliance or reporting requirements for small businesses reduce the impact of the Proposed Rule on small business?

Response: It would not. Because there is no small business that is subject to any compliance or reporting requirements under the Proposed Rule, consolidating or simplifying those requirements for small business would not reduce the impact on small business.

(d) Would establishing performance standards for small businesses to replace design or operational standards required in the proposed rule reduce the impact of the Proposed Rule on small business?

Response: It would not. Because there is no small business that is subject to any design or operational standard under the Proposed Rule, establishing alternate performance standards instead for small business would not reduce the impact on small business.

(e) Would exempting small businesses from all or any part of the requirements contained in the Proposed Rule reduce the impact of the Proposed Rule on small business?

Response: It would not. Because there is no small business that is subject to the Proposed Rule, exempting small businesses from all or any part of the requirements contained in the Proposed Rule would not reduce the impact on small business.

F. General Responses

The following general responses apply to many comments received.

1. The Proposed Rule would require completion of a performance assessment. Like many of DRC's rules, it does not provide detailed requirements but instead requires compliance with fairly broad standards. It will be the responsibility of the licensee to demonstrate that the licensee is meeting those standards.

Many comments made go to how a performance assessment should be performed and evaluated including, for example, requests to consider flooding, earthquakes, and the impact of design. We acknowledge those comments and copies will be provided to EnergySolutions and to those in DRC (including contractor support) responsible for reviewing any performance assessment that EnergySolutions submits. Those comments, however, are pertinent to that decision and not to whether the Proposed Rule requiring a performance assessment should be adopted.

2. The focus of the Utah Radiation Control Board, in line with its authority, is to protect human health and the environment. The popularity of radioactive waste disposal will therefore not be considered. The desire expressed by many commenters to keep waste out of Utah is a political question that is appropriately addressed to elected representatives.

Requests to keep depleted uranium out of Utah entirely, to the extent they are grounded in health and safety concerns, are premature. A performance assessment gives a licensee of a radioactive waste land disposal facility an opportunity to demonstrate that disposal of depleted uranium meets NRC Performance Objectives. A determination about a facility's ability to meet Performance Objectives and protect human health and safety will be made at that time, not in the context of this rulemaking.

3. Although it is beyond the scope of this rulemaking, many commenters have made requests about how the review of any performance assessment would be conducted. This general response describes the process ordinarily used.

When a significant report is received by the agency, it is reviewed by staff or staff with contractor assistance. If the staff has questions, they are compiled into "Requests for Information" (RAI) and sent to the licensee. The licensee responds to RAIs in writing and with supporting documentation. Additional RAIs may be generated during this iterative process.

If, after collecting and evaluating all relevant information, the Executive Secretary determines that it appears to be appropriate to approve the report, the staff prepares a Safety Evaluation Report and draft license amendment. A public comment period is then provided and, based on the comments received, the Executive Secretary may make necessary changes or request additional information from the licensee. Only after taking the public comments and any additional information into consideration, does the Executive Secretary make a final

determination.

In this case, the agency will follow the usual public comment format described here in making its determination on the performance assessment. There will be a public comment period on any Safety Evaluation Report and draft license amendment but not on the process leading up to that decision. However, the Executive Secretary commits to making any performance assessment, and any RAIs and responses from the licensee available on line when they are received or finalized. It is not anticipated that there will be a formal peer review process.

G. Specific Responses

Comment 1 (Utah Medical Association)

The Utah Medical Association (UMA), on behalf of the physicians in Utah, urge you to continue to push for a moratorium on the importation of Depleted Uranium into the State of Utah. We strongly believe there are probable public health risks to any importation and storage of Depleted Uranium (DU).

More than 20Q0 studies have examined DU toxicity. Considerable uncertainty exists regarding the safety of surface storage of DU as proposed by Energy Solutions. At best, limited modeling exists on the impact of DU inhalation or absorption that could occur following geological events (e.g. flooding, earthquakes, erosion) which could compromise DU canisters stored at the Utah site. Likewise, given an anticipated peak radioactivity in about 1,000,000 years, there is limited understanding of the impact of DU on future generations of Utahns. Clearly, there still exists uncertainty and much concern about future health impacts and toxicological outcomes of DU exposure. This uncertainty brings the strong possibility of unknown health and environmental impacts of radioactive storage.

The UMA Environmental Health Committee has carefully reviewed this issue. After careful review of the committee's conclusions and existing UMA policy, we have concluded that we must offer public comment against allowing importation of DU into the State of Utah. We ask the Utah Radiation Control Board to continue its rule-making process and quickly implement proposed rules that would prohibit the importation of DU while allowing for further study of the issues involved.

Currently, with the first shipment of DU arriving in Utah in December of 2009, Utah does not have anything in place to limit the importation of DU into the State. This must be accomplished in the rule-making process and must happen quickly.

We support the citizens of Utah who are also concerned about this issue. We remind the Board of the Salt Lake Tribune article on January 15th, 2010, which reported that the majority of Utah's citizens oppose the importation of DU. In addition, United State Representatives' Matheson and Chaffetz have proposed a bill in Congress that would ban imports of low level radioactive waste like DU. It is rare to see such bipartisan support on issues pertaining to the environment. Representative Matheson, also, opposes Energy Solutions' plan to mix DU with less radioactive atomic waste, which he and others feel may be a "sneaky way" to get hotter DU into Utah.

Given the unknown health and environmental effects of DU disposal, the Utah Medical Association urges the Radiation Control Board to enact a moratorium on the importation of DU until further study can be completed and assurances made as to the absence of any health risk. We must consider Utah's future generations, as we look back at the effects of radioactive testing on Utah citizens, when the long term effects of such testing was not appreciated. We feel this is the most prudent, wise and health conscious approach to protect the citizens of Utah.

Response

See Part F, Response No. 2.

Comment 2 (HEAL Utah)

Cover letter

Since November 6th 2009, 394 citizens have signed our online petition in support of additional regulations surrounding the disposal of depleted uranium. Please consider these as submissions as public comments for proposed changes to R313-25-8. The text of the petition and the names and addresses of the signers is included. If you need additional verification of the authenticity of the signatures, HEAL Utah can provide that.

Numerous citizens added their names to the petition in support of license condition 35, version 2. Please also consider these in regards to R313-25-8, as the signers' intentions are obvious.

A handful of citizens elected to interject their own personal comments as well, and those are singled out from the stack.

For communication purposes, you may consider all signers to have designated HEAL Utah as their representative in this matter, and please do not feel obligated to respond to these comments on an individual basis.

I would also draw your attention to a Salt Lake Tribune article dated February 2nd 2010 titled "Radioactive Waste Not Welcome Here: Poll: Overwhelming majority says Utah is not the right place for depleted uranium and foreign nuclear material." The poll referenced indicated 76% of Utahns are opposed to the disposal of depleted uranium in Utah.

Thank you in advance for your thoughtful consideration of the wishes and desires of Utahns, the vast majority of whom would prefer to see increased regulation of depleted uranium disposal.

Comments

I am pleased to submit these comments regarding proposed changes to R313-25-8 dealing with the land disposal of depleted uranium.

Within the next month or so, around 10,000 drums of depleted uranium from spent fuel reprocessing will be loaded onto trains in South Carolina and shipped to Utah for disposal. The proposed rule regarding land disposal of depleted uranium would ensure that such disposal is only allowed after a performance assessment is conducted and approved by Utah's Executive Secretary for Radiation Control that covers a minimum of 10,000 years and a "qualitative analysis" out to the time of peak dose.

Because the threat of additional large quantities of depleted uranium is imminent, I urge you to act with all haste to adopt the proposed rule as written. As is often said, we should not let perfection become the enemy of the good, and in this case, we believe the public interest is best served by swift adoption of the additional protections afforded by the proposed rule change.

However, we also believe that the rule does not sufficiently spell out how the performance assessment should be conducted, what role the public should have in the process, and what constitutes the threshold of success or failure within the context of the performance assessment.

In the world of performance assessments, the outcome is entirely dependent upon the starting assumptions and the "rules of the game" as determined by the software programmer.[FN1]

[FN1]: For example, see NRC's CLI-06–15, online at http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2006/2006-15cli.pdf: "At one point, Envirocare's license contained a concentration limit on uranium isotopes, but the current license allows disposal of depleted uranium with no volume restrictions. The original radionuclide concentration limit <u>was based upon a site-specific performance assessment that assumed potential intruder exposures</u>.... Utah granted Envirocare a license amendment <u>eliminating the uranium concentration limits after concluding that the intruder scenarios assumed in the Baird Report were unrealistic</u> and therefore unnecessarily conservative" [underline added]. [end of FN1]

With this in mind HEAL, Utah recommends that the Board issue a brief policy statement by the end of calendar year 2010 setting forth how the Board intends for the performance assessment to be conducted. Please consider the following suggestions for inclusion in the policy statement:

How the Performance Assessment Should be Conducted

- *The performance assessment should model future exposures to a hypothetical on-site intruder, similar to on-site intruder scenarios that form the basis of the low-level waste classification scheme found in 10 CFR Part 61. Although the specifics of a scenario might be different in different locations, at a minimum, the intruder must be modeled to come into direct contact with the waste, in conformance to Utah rule* ***R313 -25-20. Protection of Individuals from Inadvertent Intrusion****, which requires "protection of any individuals inadvertently intruding into the disposal site and <u>occupying the site or contacting the waste</u> after active institutional controls over the*

disposal site are removed." Such a scenario represents a conservative and protective approach and also acknowledges the considerable uncertainty surrounding how the climate at a given site may change in the future, and how potential use of the site may change as a result.

- *The performance assessment must take into account large changes in climate that can occur over a one million-year period. Accordingly, the geologic record should be used as a reference point for modeling future climatic and geologic conditions.*
- *The performance assessment should calculate doses to critical organs as well as whole body dose equivalents. Utah rule R313 -25-19. Protection of the General Population from Releases of Radioactivity requires this, stating: "Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants or animals shall not result in an annual dose exceeding an equivalent of 0.25 mSv (0.025 rem) to the whole body, 0.75 mSv (0.075 rem) to the thyroid, and 0.25 mSv (0.025 rem) to any other organ of any member of the public."*

A Role for the Public

- *The details of the performance assessment should be presented in a public forum, with the opportunity for a question-and-answer session. The company contracted by the state of Utah to review the performance assessment should conduct a public workshop explaining how the model works, what assumptions were used, which exposure scenarios were included, and what the results mean.*
- *Public input should be solicited by way of public notice and comment prior to Executive Secretary approval or denial of the performance assessment.*
- *The Executive Secretary's decision on whether or not to allow depleted uranium for disposal should be publicly noticed and will be appealable to the Radiation Control Board.*
- *Contingent upon funding a multi-disciplinary peer review panel should be convened to review and render a report on the efficacy and robustness of the performance assessment. The panel should include experts in the following areas:*
  - *o Geochemistry, with specific knowledge of Uranium mineralogy and geochemistry*
  - *o Hydrology, with knowledge of near-surface and porous media flow*
  - *o Climate change, with specific knowledge of the geological past of a specific location*
  - *o Gaseous diffusion, with specific expertise on radon gas*
  - *o Health physics, with knowledge of the risk of radiation exposure to humans*
  - *o Mining*
  - *o Biology and ecology, with specific knowledge of how Uranium can affect plants, wildlife, and ecosystems*
- *The peer review panel should conduct public meetings, accept public input during the review, and make its final report publicly available. The Executive Secretary should take the final report into account before making a decision on whether or not to accept the results of the performance assessment.*
- *Local, State, and Federal elected officials from Utah should seek to fund such a peer review panel, as the issues are highly complex and the Nuclear Regulatory Commission (NRC) is similarly contemplating changes to its own regulations on depleted uranium, including potential requirements for performance assessments.*

Threshold for Success or Failure

- *If probabilistic analytical software (like GoldSim™) is used to conduct the performance assessment then a high percentage of the simulations-over 95%--must meet the applicable dose limits in order for disposal of significant quantities of depleted uranium to be deemed acceptable. Otherwise, the highest-dose scenario should be determinative.*
- *Any "disruptive event" that could reasonably lead to catastrophic failure of a disposal facility up to and including the "period where peak dose occurs" should be deemed unacceptable for depleted uranium disposal. Such a requirement is in keeping with Utah rule* ***R313 -25-23. Disposal Site Suitability Requirements for Land Disposal - Near-surface Disposal****, which states: "Areas shall be avoided where surface geologic processes such as mass wasting, erosion, slumping, landsliding, or weathering occur with sufficient such frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of R313-25, or may preclude defensible modeling and prediction of long-term impacts."*

Depleted uranium is a matter of vital public interest. Submitted with this document please find 394 comments submitted through HEAL Utah's website. For your convenience, the comments are grouped and tabulated onto spreadsheets, with the exception of five comments that were unique. Please send any correspondence on these comments to HEAL Utah rather than to the individuals listed.

Please also note that a recent poll indicates that registered Utah voters of all political stripes oppose depleted uranium disposal in the state, by a margin of 76% opposed to 16% that support, with 8% undecided. A news article detailing the poll is included with this submission for your convenience.

Furthermore, we continue to believe that a disposal depth of 10 feet for depleted uranium is insufficient to protect Utah public health and the environment and we incorporate by reference HEAL Utah's comments submitted on proposed license condition 35 to EnergySolutions' radioactive materials license, submitted December 23,2009.

We also believe existing performance assessments for the EnergySolutions' facility are not adequate to capture the hazard of depleted uranium and incorporate by reference HEAL Utah's comments on EnergySolutions' radioactive materials license renewal, submitted September 21,2007. We also incorporate by reference technical comments submitted on the proposed changes to Utah rule R313-25-8 by Doctors Nelson, Oviatt, and Rupper.

In conclusion, because of the overwhelming public concern about depleted uranium in the state and the inadequacy of current assessments and approaches to the issue, we strongly urge you to adopt proposed changes to Utah rule R313-25-8 requiring a performance assessment. We also urge that the Board issue a policy statement that sets forth Board expectations for how that performance assessment will be conducted, including relevant assumptions and scenarios, a significantly enhanced public participation component and thresholds of acceptability of the performance assessment.

Response

The Executive Secretary notes the comment supporting the rule change to require a performance assessment. As to the burial depth of depleted uranium, how a performance assessment should be conducted and evaluated, and a Board policy statement on these issues, *see* Part A, Background; Part F, General Response Nos. 1, 2, and 3; and Response to Comment No. 39.21. It is not anticipated that there will be a formal peer review process. *See* Part F, General Response No. 3.

Response to comments incorporated by reference:
Three of the five comments submitted via the HEAL website contain the statement: "I also urge you to include provision which fully take into account levels of peak dosage and geomorphologic impacts of erosion on the Clive facility." Such issues relate to how the performance assessment will be performed and not to the rule itself. *See* Part A, Background, and Part F, General Response No. 1. The remaining issues in the five comments raise general concerns about disposal of depleted uranium, including the potential for an unintended live ordnance drop or aircraft accident from activities on Utah Test and Training Range, and are not specific to this rulemaking. *See* Part F, General Response No. 2.

The Executive Secretary has previously responded to HEAL's comments on license condition 35 and license renewal. Response to Nelson *et al* comments are set forth in Response 27.

Comment 3 (Riley Parker)

My Plea is please keep depleted Uranium out of Utah. The cost of sending it here should be used to take care of it where it already is. I have thanked ... Utah our Governor and our U.S. Representative Jim Matheson for their help in keeping it out.

Money is nothing in comparison to good health. I can't attend the meetings I am 87 years old- but I am concerned about the future.

Response

See Part F, Response No. 2.

Comment 4 (Gary and Mary Thorne)

Please no more depleted Uranium or any other trash. Utah should not be a toxic waste dump. What do the citizens of Utah get out of it, nothing but a lower quality of life?

Think of future generations not just the bottom line of Energy Solutions.

Response

See Part F, Response No. 2.

Comment 5 (Utah Manufacturers Association)

Comment 5.1

Utah Manufacturers Association, the "voice of industry", representing more than 800 member companies in Utah, has grave concerns about the process the Radiation Control Board is proposing to promulgate rules regarding the disposal of depleted uranium in Utah.

The existing NRC Regulations are adequate to protect public health and the environment of the State. The NRC recently reviewed its regulations and confirmed that depleted uranium is Class A waste and may be suitable for near-surface disposal. The NRC has initiated a limited rulemaking to specify a requirement for site-specific analyses to ensure the continued safe disposal of DU; however, they have explicitly stated that uranium is properly classified as Class A waste as part of this process.

Response

As described in the Statement of Basis and in this Comment Response document, NRC has acknowledged that disposal of significant quantities of depleted uranium was not analyzed at the time NRC created its waste classification scheme, and that the classification scheme alone is therefore insufficient to ensure that NRC Performance Objectives will be met. NRC has recommended, and is developing a rule to require that performance assessments be reviewed and, if necessary, revised before disposal of significant quantities of depleted uranium in order to ensure that NRC Performance Objectives will be met.

Comment 5.2

The NRC found no need for any immediate action while its limited rulemaking proceeds. The NRC has concluded there is no immediate health and safety issue regarding the disposal of DU. In determining how to proceed with its limited rulemaking, it explicitly considered and rejected the need for an expedited rulemaking or Order regarding the ongoing disposal of DU.

Response

See Response to Comment 39.20

Comment 5.3

Existing technical analyses demonstrate that a moratorium on DU disposal pending the NRC rulemaking is not necessary to protect public health and the environment of the State. EnergySolutions has conducted technical analyses that clearly demonstrate that there is no near term threat from continuing disposal while the NRC rulemaking proceeds, and furthermore that the site is safe for the continued disposal of large quantities of depleted uranium. These studies consist of current performance assessment, analyses by NRC staff in SECY-08-0147, an assessment of the site-specific conditions at Clive and their impact on exposure scenarios, and comparison with the concentration considered by the NRC in the 1981 rulemaking (0.05 uCi/gm).

Response

See General Response to Comment 39, Nos. 4 and 5, and Response to Comment No. 39.8.

Comment 5.4

In fact, the current performance assessment, which EnergySolutions is in the process of updating, is itself adequate to demonstrate the absence of any near-term impact. The existing license provisions are more than adequate to protect public health and the environment of the State during the NRC rulemaking and for thousands of years.

Response

A licensee may, if it chooses, rely on existing performance assessments to comply with the Proposed Rule. *See* General Response to Comment No. 39, Response No. 2, regarding timing.

Comment 5.5

EnergySolutions already has agreed to modifications to its license that include, among other things, ensuring that DU is disposed of a minimum of 10 feet from the top of the cover on the site. This additional depth will specifically serve to retard the emission of radon at that point in the future when it begins to be generated. Radon is the principal source of the potential dose resulting from the decay of uranium.

Response

Please *see* Response to Comment 39.21.

Comment 5.6

The proposed rule is in conflict with State law. Utah Annotated Code (§19-3-104(8)) prohibits the Radiation Control Board from adopting rules "...that are more stringent than the corresponding federal regulations which address the same circumstances." The proposed rule is clearly more stringent than NRC rules that govern the disposal of depleted uranium as Class A waste (10 CFR 61).

The Radiation Control Board has not made the finding necessary that would allow it to promulgate rules no more stringent than" NRC regulations. Utah Annotated Code (§19-3- 104(9) allows the Radiation Control Board to adopt rules "more stringent than corresponding federal regulations for the purpose described in Subsection (8) only if it makes a written finding after public comment and hearing and based on evidence in the record that corresponding federal regulations are not adequate to protect public health and the environment of the state." The

Board has not initiated a process, including holding hearings to take evidence. Without such evidence, the Board cannot make any such finding.

Furthermore, the Radiation Control Board has not identified which standard or part of a standard is inadequate. To make the finding necessary that would allow it to promulgate rules no more stringent than" NRC regulations the RCB would have to be explicit about the inadequacy of the subject standard and no such identification has been made.

The proposed rule places the State of Utah in direct conflict with the NRC's Agreement State Program. The rules under which the State of Utah is delegated the authority to oversee compliance with the Atomic Energy Act, the Agreement State program, imposes certain limitations on the state. Among those are designations regarding the compatibility of state regulations with NRC regulations. The NRC requires that State regulations governing the disposal of low level radioactive waste be essentially identical" to those of the NRC. The proposed rule fails to satisfy that requirement.

Response

Please *see* Parts C and D above and Response to Comment 39.11 (need for an evidentiary hearing). In the event that it is determined that the Proposed Rule is more stringent under Utah Code Ann. § 19-3-104(8) and (9), the findings necessary to support this rulemaking are found in Attachment 5.

The NRC has determined that the Proposed Rule is not in conflict with NRC's Agreement State Program. *See* Comment No. 36.

Comment 5.7

UMA was intimately involved in the passage of the legislation restricting Utah State regulatory agencies from adopting rules and regulations "more stringent than corresponding federal regulations" unless after a public hearing and based on evidence in the record that corresponding federal regulations are not adequate to protect public health and the environment of the state. It has served us well and has fostered a healthy business climate in Utah. Predictability is crucial to Utah businesses and failure to comply with state statute upsets that principle. We therefore, respectfully request the Radiation Control Board follow Utah statute. If state agencies ignore this law Utah businesses will experience damage to there business climate. It is our understanding that the Radiation Control Board members have been informed of the law but have chosen to ignore it. UMA representing manufacturers across the state will not tolerate violation of this law.

For the reasons stated above Utah Manufacturers Association opposes the process underway by the Radiation Control Board and requests they withdraw the proposed regulations until they can make a finding that would support promulgating rules more stringent than corresponding federal rules.

Response

As described in Parts C and D, above, and in Response to Comment 39.6, the Executive Secretary does not believe the Proposed Rule is more stringent that corresponding federal rules.

The Executive Secretary acknowledges the importance of providing a positive and predictable regulatory environment for business. That is among the reasons that the stringency provisions of DEQ statutes have been used so infrequently. In this case, however, as described in the Statement of Basis and in this Comment Response document, the Proposed Rule is warranted, even if it is found to be more stringent than corresponding federal regulations, and must be used.

Comment 6 (Steven and Maridee Haycock)

We write in support of the Board's determination to create a new rule to ensure that no depleted uranium enters Utah before completion of detailed and thorough public health studies and performance assessments. We believe this rule must consider levels of peak dosage and must study the impact of all foreseeable geological processes. We believe additional safeguards are imperative.

It is imperative that our state work to protect its people from exposure to radiation and contamination. Decisions concerning waste of this nature will impact our descendants forever; these decisions must be made methodically and with the utmost scientific integrity, free of the short-term thinking that dominates the political process.

Response

The commenters' support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 7 (Peter Corroon, Mayor, Salt Lake County)

I believe more research and data must be collected to determine the safest methods of the disposal of depleted uranium (DU) in Utah. This data must include possible consequences of disruptive future events such as earthquakes, flooding, and changes in climate. All potential public health consequences must be analyzed before current shipments of DU are buried and the state of Utah considers importing more DU. We are especially concerned that high-level radioactive waste will be transported through Salt Lake County.

Despite repeated public concerns to the Governor's office about this issue it is incredibly unfortunate that over 5,000 drums of DU have recently been shipped to Utah before necessary studies have been completed.

It is clear that DU presents possible hazards to the safety of Utahns today and into the future. We must create high standards for the disposal of DU and the proposed new rule is a step in that direction. Future generations should not be forced to accept the potentially harmful consequence of our lack of due diligence and research on this important issue.

Response

The request for additional research and data is consistent with the goals of the Proposed Rule. With respect to the requests for analyses of events such as earthquakes, flooding and climate changes, please *see* Part F, Response No. 1. The Board does not have jurisdiction over waste transportation matters; those comments are beyond the scope of this rulemaking.

Comment 8 (NEI/Ralph Andersen)

On behalf of the nuclear industry, the Nuclear Energy Institute (NEI) submits the following comments in response to Utah's proposed rule regarding the land disposal of depleted uranium (DU) within the state of Utah. We trust you will find these comments useful, and we appreciate the stakeholder comment opportunity provided by the state.

We share your goal of ensuring that licensed nuclear energy activities protect public health and safety and the environment, and recognize your role as an agreement state in this regard. As such, we support Utah's expectation that low-level radioactive waste disposal practices within Utah will conform to the applicable requirements in 10 CFR Part 61 and the corresponding provisions of the Utah regulations. To this end, it is our understanding that

Energy Solutions plans to submit additional site specific information on its Clive facility to Utah for review and approval by year's end.

We support this continued site-specific work and believe that Utah's proposed rule is premature and unnecessary at this time. NEI believes that: 1) Utah can fulfill its regulatory role to ensure safety without promulgating a proposed rule at this time; 2) NRC is currently developing a proposed rule addressing the disposal of large quantities of DU; 3) Utah will need to promulgate a compatible rule once the NRC's rulemaking is complete; and 4) NRC has stated that, as currently written, the Utah proposed rule would create a conflict with the current 10 CFR Part 40 definition of DU and must be modified to be found compatible with existing NRC rules.

Response

The commenter's opposition to the rule is noted. Please note that the Proposed Rule has been changed to resolve the potential conflict identified by NRC. *See* Part B.1, above.

<u>Comment 9</u> (David Moir)

As a paralegal and a citizen of the State of Utah I am concerned that the Division of Radiation Control {DRC) is now willing to skirt established law in favor of becoming politically popular.

Opposing EnergySolutions has become increasingly politically popular. We have seen big name political figures jump on the hate EnergySolutions bandwagon, joining the chorus of antagonist fanatics who pitch outright lies in the attempt to generate fear, which spends just like cash. They use it to buy votes, elected officials, press coverage, funds and to press their own political agenda.

The one voice of reason in this whole debate has been the DRC. As those who regulate EnergySolutions, the DRC has always known the truth and thus could sift through the mountain of lies and threat them with the contempt they deserve - ignore them. But the Division, is so doing, has received much criticism from EnergySolutions antagonist, accused of receiving brides, kickbacks and turning a blind eye to the dangerous and polluting Energy Solutions.

The Division to their credit, has discarded such attacks and continued with their business. But it seems that all that is about to change. The Division has been under pressure from Heal Utah and other antagonists, to enact rules regarding the disposal of Depleted Uranium (DU) that are more stringent than federal regulations.

May I remind the Division that Utah Annotated Code (§19-3-104(8) prohibits the Radiation Control Board from adopting rules "...that are more stringent than the corresponding federal regulations which address the same circumstances." The proposed rule is clearly more stringent than NRC rules that govern the disposal of depleted uranium as Class A waste (10 CFR 61).

The Board has not made the finding necessary that would allow it to promulgate rules more stringent than NRC regulations. Utah Annotated Code (§19-3-104(9)) allows the Radiation Control Board to adopt rules "more stringent than corresponding federal regulations for the purpose described in Subsection (8) only if it makes a written finding after public comment and hearing and based on evidence in the record that corresponding federal regulations are not adequate to protect public health and the environment of the state."

The Board has not initiated a process, including holding hearings to take evidence. Without such evidence, the Board cannot make any such finding. Furthermore the Board has not identified which standard or part of a standard is inadequate. To make the finding necessary that would allow it to promulgate rules "more stringent than" NRC regulations the RCB would have to be explicit about the inadequacy of the subject standard and no such identification has ben made. The NRC recently reviewed its regulations and confirmed that depleted uranium is Class A waste and may be suitable for near-surface disposal. The NRC has initiated a limited rulemaking to specify a requirement for site-specific analyses to ensure the continued safe disposal of DU; however, they have explicitly stated that uranium is properly classified as Class A waste as part of this process.

The NRC found no need for any immediate action while its limited rulemaking proceeds. The NRC has concluded there is no immediate health and safety issues regarding the disposal of DU. In determining how to proceed with its limited rulemaking, it explicitly considered and rejected the need for an expedited rulemaking or Order regarding the ongoing disposal of DU.

Existing technical analyses demonstrate that a moratorium on DU disposal pending the NRC rulemaking is not

necessary to protect public health and the environment of the State. EnergySolutions has conducted technical analyses that clearly demonstrate that there is no near term threat from continuing disposal while the NRC rulemaking proceeds, and furthermore that the site is safe for the continued disposal of large quantities of depleted uranium. These studies consist of current performance assessment, analyses by NRC staff in SECY-08-014, an assessment of the site-specific conditions at Clive and their impact on exposure scenarios, and comparison with the concentration considered by the NRC in the 1981 rulemaking (0.05 uCi/gm). In fact, the current performance assessment, which EnergySolutions is in the process of updating; is itself adequate to demonstrate the absence of any near-term impact.

The existing license provisions are more than adequate to protect public health and the environment of the State during the NRC rulemaking and for thousands of years. EnergySolutions already has agreed to modifications to its license that include, among other things ensuing that DU is disposed of a minimum of 10 feet from the top of the cover on the site. This additional depth will specifically serve to retard the emission of radon at that point in the future when it begins to be generated. Radon is the principal source of the potential dose resulting from the decay of uranium.

Independent of the NRC rulemaking, EnergySolutions already has commenced preparation of technical analyses. The updated technical analyses will explicitly address the longer performance period that arises from the decay of uranium and its progeny. Any findings from the updated technical analyses can be addressed before any health and safety issues arise. The disposal of depleted uranium during the interim period while the NRC conducts its rulemaking results in no irreversible harm. Steps necessary to provide additional mitigation, if necessary, for example providing additional depth, can be taken long before there is any threat from the disposal of depleted uranium. The proposed rule places the State of Utah in direct conflict with the NRC's Agreement State Program. The rules under which the State of Utah is delegated the authority to oversee compliance with the Atomic Energy Act, the Agreement State program, imposes certain limitations on the state. Among those are designations regarding the compatibility of state regulations with NRC regulations.

I encourage compliance with establish law and the discarding of those with funds enough to buy the loudest voices. Has anyone ever asked the antagonist, where are the facts necessary to support their arguments? Based on what do they make their allegations? Or are the voices of those who continue to yell - help us defeat EnergySolutions - all we need is your check or credit card number, just accepted without ever being questioned?

You must make decisions based on facts, not fiction. In so doing, you cannot ignore established law in favor of those who say - trust us, we're cute and we make Dutch apple pie (it is terrific) While ignoring law that prohibits the passing of regulations more stringent than federal rules may make you popular with such people, it does not make it right. The correct thing to do is obvious.

Response

The commenter's opposition to the Proposed Rule is acknowledged.

Please *see* the following responses to comments, which are responsive to the comments raised:

- Parts C, D and Responses to Comments Nos. 5.6 and 39.6, with respect to the comments regarding stringency of the Proposed Rule;
- Response to Comment No. 39.11 regarding the requirements for rulemaking and the need for an evidentiary hearing;
- General response to Comment No. 39, No. 3 and Response to Comment No. 39.20 regarding NRC's rejection of the need for expedited rulemaking;
- General response to Comment No. 39, No. 3 with respect to the near term threat from continuing disposal;
- General response to Comment No. 39, Nos. 4 and 5, and Response to Comment No. 39.8 with respect to reliance on the study in the SECY-08-0147 and on expert studies that have not been submitted to or approved by the agency;

- Response to Comment No. 5.4 regarding relying on existing performance assessments;
- Response to Comment No. 39.21 regarding the adequacy of the 10 foot barrier; and
- General response to Comment No. 39, No. 7 regarding the possibility of mitigating concerns.

With respect to the basis for the rule generally and the inappropriateness of relying on the waste classification for depleted uranium in the absence of a performance assessment, please *see* the Statement of Basis generally and Part A, above.

Comment 10 (Karen F. Watson)

This letter is to offer adamant support to a company in the west desert, EnergySolutions, located at Clive, Utah. As you can see from my letterhead, I live in Grantsville, Utah the nearest community to EnergySolutions, Dugway, EG&G, MagCorp, Hill Air Force Base Test Range, landfills and other operations located in the west desert. Of all the industries, EnergySolutions is by far the safest and well managed. EnergySolutions is a highly regulated, self reporting company, as you well know, and has a good reputation with the Utah Department of Environmental Quality. My opinion of this company is that if the State of Utah would ignore the detractors, mainly HEAL Utah and competitive companies trying to curtail business in Utah, and come to the conclusion that our state is blessed with a natural geological phenomenon located in the west desert which is ideally suited for the disposal of low-level radioactive waste. All of the natural resources, clay, gravel, rock, etc. exist naturally on or near the site, as well as the added plus of poor, contaminated ground water. Should we have a legislative body and Governor who could turn this mentality around " the state of Utah could be totally out of debt and provide outstanding education to its future, the children of Utah. Years ago, several Utah business associations and business lobbyists united to successfully achieve passage of legislation restricting Utah State regulatory agencies from adopting rules and regulations "more stringent than corresponding federal regulations" unless after a public hearing and based on evidence in the record that corresponding federal regulations are not adequate to protect public health and the environment of the state. That law is found in Utah Annotated Code (19-3-104(8)).

Recently, at the urging of HEAL Utah, the Utah Radiation Control Board has proposed a rule which is clearly more stringent than corresponding U.S. Nuclear Regulatory rules that govern the disposal of depleted uranium as Class A waste. The Board has not initiated a process, including holding a public hearing to take evidence that the federal regulations are not adequate. The Board has not even attempted to identify which specific standards, rule or regulation is not adequate. Yet, the Board has initiated a rulemaking process to promulgate more stringent regulations at the urging of HEAL Utah, a disappointment to intelligent citizens of the state.

Over the years the Utah "no more stringent regulation" law has served the state very well and has fostered a healthy business climate in Utah. If state agencies ignore this law, Utah business will experience damage to its business climate, i.e. other companies in the state that HEAL Utah may wish to challenge. You as a body have been informed of the law and obviously have chosen to ignore it. Be aware, Utah business will not tolerate violation of this law. As a citizen of Tooele County, state of Utah, I expect that the Radiation Control Board will conduct its duties in accordance with the law, and allow EnergySolutions, a Utah Company to conduct its business within the law.

Response

The commenter's opposition to the Proposed Rule is acknowledged. Please *see* Parts C, D and Responses to Comments Nos. 5.6 and 39.6 and 39.11, with respect to the comments regarding stringency of the Proposed Rule and the need for an evidentiary hearing.

With respect to the basis for the rule generally, please *see* the Statement of Basis generally and Part A, above. Other comments raised are beyond the scope of this rulemaking.

Comment 11 (Paulette McGhie)

"As a citizen of Utah, I firmly believe that our state should work to protect future generations from radiological exposure and contamination. I therefore stand behind and support the Board's course of action to devise a new rule to ensure that no depleted uranium comes to our state in advance of the completion of thorough public health studies and performance assessments. A new rule should also take into account when levels of peak dosage occur as well as likely geological processes such as flooding and erosion."

Response

The commenter's support for the rule is noted. The request for a rule to ensure that no depleted uranium comes to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 12 (Evelyn M. Reeliarde)

Utah Department of Environmental Quality, please see that Depleted Uranium only comes to our state after the completion of thorough health studies. The increase in radiation could affect my grandchildren and great grandchildren.

Also a new rule should take into account when levels of peak dosage occur, as well as likely geological processors ... flooding and erosion.

Response

The commenter's support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 13 (Sandra Hays)

I believe that our state should work to protect future generations from radiological exposure and contamination. I therefore stand behind and support the Boards course of action to devise a new rule to ensure that No Depleted Uranium comes to our state in advance of completion of thorough public health studies and performance assessments. A new rule should also take into account when levels of peak dosage occur as well as likely geological processes such as flooding and erosion.

Response

The commenter's support for the rule is noted. The request for a rule to ensure that no depleted uranium comes to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 14 (Tanya Andrew)

As a citizen of Utah, I firmly believe that our state should work to protect future generations from radiological exposure and contamination. I therefore stand behind and support the Board's course of action to devise a new rule to ensure that no depleted uranium comes to our state in advance of the completion of thorough public health studies and performance assessments. A new rule should also take into account when levels of peak dosage occur as well as likely geological processes such as flooding and erosion.

Response

The commenter's support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 15 (Mary Ellen Navas)

Sadly, I will not be able to attend the meeting of the RCB tomorrow afternoon, so I want to convey my comments about DU to you. My point of view is simple. I do not think the Utah site at Clive is the right place for this highly dangerous byproduct of uranium enrichment or re-processing. I believe the RCB has an opportunity to put teeth into the protection of Utah and the people ahead of us by instituting a new rule that would require ANY storage or disposal to be sufficiently effective to protect future generations from radiological exposure or damage. The Texas model of utilizing "peak dose" is a conservative position. Please be VERY conservative as you design a rule to protect Utah.

Response

The commenter's support for the rule is noted. The request for a rule to ensure that no depleted uranium comes to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. The request for a "conservative" rule is unclear and therefore the Executive Secretary cannot respond. To the extent the commenter is requesting conservative application of the Rule, please *see* Part F, Response No. 1.

Comment 16 (M. Horner and Robert W. Orton)

As citizens of Utah, we firmly believe that our state should work to protect future generations from radiological exposure and contamination. We therefore stand behind and support the Board's course of action to devise a new rule to ensure that no depleted uranium comes to our state in advance of the completion sf thorough public health studies and performance assessments. A new rule should also take into account when levels of peak dosage occur as well as likely geological processes such as flooding and erosion." It has never been our intention nor is it our desire to make Utah the national or world dumping ground for nuclear waste.

Response

The commenters' support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak

dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 17 (Lisa Rutherford)

As a Utah resident, I am strongly (!) opposed to bringing in more depleted uranium to our state. What a travesty that this has been allowed at all. Now is the time for the Board to pursue establishing tough, new standards before more DU is brought to Utah. The potential harm from exposure to DU should take into account when levels of peak dosage occur and consider the effects of flooding and erosion.

I've written before and often feel that my pleas and those of many others fall on deaf ears. Do you not have loved ones who live in this state and are also affected by these decisions? I find it difficult to believe that anyone would want their family exposed to these materials. We've been told before (remember the 50s?) that radioactive material was not harmful only to find out later that was a ruse, and we were the stooges.

Response

The commenter's support for the rule is noted. The request for a rule to ensure that no depleted uranium comes to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 18 (Susan F. Fleming)

I have been a resident of Utah for over thirty years and am deeply concerned about shipments of radioactive waste, specifically Depleted Uranium, to Utah. Today we need to work hard to protect our citizens and future generation from exposure to radiation and contamination. Therefore, I stand behind and support the Board's course of action to devise a new rule to ensure that no depleted uranium comes to our state in advance of the completion of very thorough public health studies and performance assessments. A new rule should also take into account when the levels of peak dosage occur. The fact that there are underground streams and aquifers, and that our state is prone to earthquakes and earth movement on a regular basis should be taken into amount. Since we have other ongoing geological processes, such as erosion and flooding, these should be calculated as well.

In summary, I am opposed to having one or more companies jeopardize the residents of Utah by bringing toxic and radioactive wastes into our state. Depleted Uranium only gets hotter as the years go by, and there is no way to prevent this escalation of radioactivity. Please pass rules and regulations to protect our citizens and our future children from this serious problem. Your prescient and protective regulatory actions today may prevent serious disaster in the future, so please think very carefully about this issue.

Response

The commenter's support for the rule is noted. The request for a rule to ensure that no depleted uranium comes to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 19 (Marcia Tendick)

As a citizen of Utah, I firmly believe that our state should work to protect future generations from radiological exposure and contamination. I therefore stand behind and support the Board's course of action to devise a new rule to ensure that no depleted uranium comes to our state in advance of the completion of thorough public health studies and performance assessments. A new rule should also take into account when levels of peak dosage occur as well as likely geological processes such as flooding and erosion.

This is an extremely important issue to me, as I would think it would be for anyone considering the health and welfare of future generations in Utah. Please put the future of all humans ahead of any consideration of monetary gain.

Response

The commenter's support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 20 (Cavanagh Services Group)

The subject Notice of Proposed Rule was published in the Utah State Bulletin Number 2010-1 Dated January 01,2010. The Notice provides for public review of the Proposed Rule through February 2, 2010. The proposed rule would require facilities that wish to land dispose of DU to complete and have approved a site-specific performance assessment that demonstrates that the performance standards specified in 10 CFR Part 61 and corresponding provisions of Utah rules will be met. Therefore, the Utah Radiation Control Board, at its 12/08/2009 meeting, voted to amend Section R313-25-8 that requires EnergySolutions or any facility that land disposes significant quantities of DU to submit for review and approval a site specific performance assessment prior to disposal of significant quantities of DU.

The subject Notice of Proposed Rule contains a statement and data which is inaccurate and as such the Notice of Proposed Rule as published failed to provide to the public all necessary data and information in order to effectively permit comment. Specifically, the Notice of Proposed Rule under the heading "Small Businesses" states: "No small business in Utah will be directly impacted. The only potential sources of substantial quantities of DU for disposal--the United States Department of Energy and privately-held uranium enrichment facilities-- are not small businesses and are not located in Utah."

While it is true that the only potential source of substantial quantities DU for disposal is the United Stated Department of Energy (US DOE), it is not true that such a rule will not impact Small Business in Utah.

Cavanagh Services Group, Inc, is a Utah based, Small Business Administration Certified 8(a), Small Disadvantaged Woman Owned, Small Business. Cavanagh Services Group is currently under contract with the US DOE for the transportation of DU from the DOE's Savannah River to Clive, Utah. This contract is a significant percentage of the Cavanagh Services business plan for 2010. Cavanagh has increased its staff by over 80% from 2008 to 2009. Delays of transporting DU will have a significant financial and personnel impact on Cavanagh. Cavanagh feels that the Notice of Proposed Rule is in error in misrepresenting the facts and as such does not accurately inform the citizens of Utah in order that they may provide related comments.

In light of the errors associated with the Notice of Proposed Rule, Cavanagh feels that the Division of Environment Quality must correct the Notice by changing the Small Business statement to include that Small Businesses in the State of Utah will be significantly impacted by this rule. Further Cavanagh requested that the Notice of Proposed Rule then be republished in the Utah State Bulletin and that the public be given additional time to consider the Proposed Rule with all of the available facts.

Response

Please *see* Part E of this Response to Comment document.

Comment 21 (Patty Herndon)

I am truly disappointed by the extent that the handling of Depleted Uranium has become a huge political debate. I have seen a lot of comments, facts and 'experts' presenting their views on both sides. I am afraid that the environmentalist groups are making a very large effort to prey on the general citizen's innate 'fear' of things that 'could' be dangerous. I think that they are pushing their own political and possibly personal agenda's by attacking and demonizing the process of handling and properly disposing of Depleted Uranium in the EnergySolutions Clive Facility in the West Desert.

I have lived in Utah for the past 17 years. My years before that were spent in Idaho. In Idaho I lived in different cities that have been very closely associated with the now known Idaho National Laboratory, whether municipally or through jobs created. The research and advancements accomplished by that facility have been incredible. The benefits of nuclear power in general have been innumerable, and have improved my life personally. I also remember learning about radioactivity and what it is and its benefits, as well as its hazards, as a young child in school. As an adult I have had many opportunities to work in and around radioactive materials.

I have a bachelor's degree in Biology with a minor in Chemistry. Before I graduated, I began working in the environmental testing industry as a Laboratory Technician. My job was in a Third Party Environmental Laboratory that did certified analytical testing for different companies. I handled various types of material - soil, groundwater, even potentially contaminated protective equipment, etc. and performed analytical procedures and tests on them. The Environmental Protection Agency (EPA), the Division of Radiation Control (DRC) and/or the Nuclear Regulatory Commission (NRC) each played some role in 'why' a customer had to have a material analyzed and verify or confirm that there was a deemed hazard involved with the material. My supervisors all the way up to the owner of the company took the time to help me understand the potential hazards of the things I would and did handle on a daily basis. I used the protective equipment and monitoring devices provided for my safety and I did my job ... Safely. And in doing so, I help provide customers with the information they needed, and often regulators also, to properly handle and manage potentially hazardous materials properly.

I currently have an opportunity to work for EnergySolutions at their Clive Facility. I work very hard everyday to do my job to the best of my abilities to help EnergySolutions handle low level radioactive waste materials safely and properly dispose of them in such a way that the material will be less of a hazard to the general populous. There are many regulations associated with this process.

I feel very confident that EnergySolutions is very vigilant in adhering to these regulations, as well as keeping me and everyone else safe in the process. I would not be working here if it wasn't important. I feel that the recent proposal to adjust the rules and regulations for the handling of Depleted Uranium is completely unfounded and ridiculous. The U.S. Nuclear Regulatory rules have addressed the potential hazards and provide appropriate expectations for the proper handling of Depleted Uranium. Uranium processing facilities, nuclear facilities and disposal facilities have been handling uranium in all forms with employee and community safety in mind for many years under these regulations, what has changed now? Uranium itself hasn't changed, the hazards associated with it haven't changed, the people handling it are still concerned about working with it safely, so what has changed to warrant changes to the rules and regulations. I am afraid that the environmental group Heal Utah that is spurring these changes are doing it because they hope for some kind of political and maybe personal gain. They are ignoring the years of experience and science and playing on the fear of the general public that may not know enough about radioactive material to see through their unfounded claims. If you do not know a lot about radioactivity, it can seem very scary and dangerous based on the major catastrophes that have occurred in human history. It is however these same catastrophes that helped the U.S. Nuclear Regulatory Commission establish the rules and regulations in the first place. Please do not allow them to prey on the general public's ignorance to suit their political or personal desires. I have great confidence in the great people that worked long and hard to establish the rules and continue to work to improve them when necessary. So since nothing has changed with Depleted Uranium itself, as far as I am aware, I feel that the Utah Radiation Control Board has no reason to listen to the unfounded urging of Heal Utah.

Response

The commenter's opposition to the Proposed Rule is acknowledged.

With respect to the basis for the rule generally, please *see* the Statement of Basis generally and Part A, above. Other comments raised are beyond the scope of this rulemaking.

Comment 22 (Carolyn Potter)

Utah is a wonderful place to live and we need to do everything to keep it as safe as possible, especially from nuclear waste being sent which is not within a few hundred miles or another country's. There needs to be a limit on waste as to what Energy Solutions or any company wants to bring to Utah. Yes, EnergySolutions is in business to make money but allowing them to take waste from remote areas is greedy on their part. They only want to line their pockets with money at the expense of polluting Utah more. E. S. doesn't care about the quality or safety of Utah's land or its people. They care about their monetary gain. E. S. and other nuclear companies need to establish storage sites (close in proximity) in their areas of the U. S. or in foreign countries (e.g. Italy, UK, Germany, etc.) to take care of their nuclear waste. (e.g. sending waste from the government cleanup of the Savannah River atomic-bomb site in South Carolina to Utah is not a good idea.) Utah or any other state doesn't need to take on the world's problems by disposing their waste here.

Stop these ideas of bringing nuclear waste across the oceans or many hundreds or thousands of miles across the U.S. to any one place in the America . It is unsafe and not practical. (See enclosed article--"Company cited for duct-tape incident") There are probably more of these kinds of things happening that is covered up. E.S.'s philosophy on this is who cares what we store in the ground here or if we pollute with our shipments on the way to Utah!!! Well, I care and a lot of other people care.

E.S. is unprofessional, deceitful (trying to circumvent the law by blending waste-blending should be reclassified to a hotter waste if there is one speck of Classes B and C waste in it) and they're money mongers. That's their one concern--$$$$$!

Please keep a rein on E.S. and other pollutant companies who want to take advantage of Utah. This is our state not the world's nuclear dumping ground.

Oh, by the way Energy Solutions should be taxed more for Utah putting up with all this underhandedness that they continue to dish out.

Response

These comments are beyond the scope of this rulemaking. Please *see* Part F, Response No. 2.

Comment 23 (Dr. Lou Borgenicht)

I am a pediatrician and I have worked as such for many years, having obtained my Doctor of Medicine (MD) degree from Case Western Reserve University School of Medicine in 1970. I am aware of the unique and synergistic impacts that depleted uranium's radioactivity and toxicity can have on the human body. Children and infants are especially susceptible to the ill effects caused by depleted uranium exposure.

According to latest report from the National Academies of Science titled "Bier VII: Health Risks from Exposure to Low Levels of Ionizing Radiation," there is a linear dose-response relationship between exposure to ionizing radiation and the development of solid cancers in humans. The report also makes the following points:

1. It is unlikely that there is a threshold below which cancers are not induced. Thus, the smallest dose of radiation has the potential to cause a small increase in health risks to humans.

2. Ionizing radiation has sufficient energy to change the structure of molecules, including DNA, within the cells of the body. Some of these molecular changes are so complex that it may be difficult for the body's repair mechanisms to mend them correctly.

3. An important finding from the studies was that the occurrence of solid cancers increases in proportion to radiation dose. More than 60% of exposed survivors received a dose of radiation of less than 100 mSv (millisievert).
4. Evidence suggests excess cancers can be detected as low as 10 mSv in utero. Depleted uranium is a known nephrotoxin (toxic to the kidney), and there is a growing body of evidence demonstrating that depleted uranium may also be genotoxic, mutagenic, tumorigenic and neurotoxic. Children as well as the embryo/fetus are likely at a higher risk from the mutagenic and carcinogenic nature of depleted uranium. As a neurotoxin, uranium isotopes are similar to lead. The primary form that uranium isotopes take in the body is the uranyl cation (U_{22+}) and may act in an analogous fashion to the lead cation (Pb2+.). This lead cation has a well known and tragic history as a neurotoxin, especially in children.

I am aware that EnergySolutions has accepted large amounts of depleted uranium for disposal in Utah in the absence of regulations which would require studies as to health effects and safeguards against inadvertent exposure.

In conclusion, I strongly urge the Utah State Radiation Control Board to adopt measures which would preclude acceptance of any additional depleted uranium into our state until these issues are fully investigated and substantial protections exist to protect human health and the environment for the duration of depleted uranium's hazard life.

Response

The commenter's support for the rule is noted. With respect to the request to consider specific impacts from depleted uranium, please *see* Part F, Response No. 1.

<u>Comment 24</u> (Judy M. McCowey)

I totally oppose nuclear waste disposal in Utah. Here are just a few reasons: it becomes more hazardous over time; it's dangerous to humans, animals and to the environment and has long-term effects. As responsible people we need to consider all of Utah present and future lesser immediate greed and selfishness of a few. Please don't waste Utah.

Do the research.

Response

The opposition to nuclear waste disposal in beyond the scope of this rulemaking. Please *see* Part F, Response No. 2.

<u>Comment 25</u> (Naomi Franklin)

Depleted uranium ("DU") is the 'waste' from enrichment of Uranium 235. U235 is enriched for producing electricity in nuclear energy plants --- and for nuclear weapons. The amount of DU waste is thus a measure of the amount. of U235 enrichment proceeding in the United States. Judging from existing and projected DU amounts, a great deal of U235 enrichment is anticipated. On what basis?

DU waste is radioactive as delivered to Utah, and will become more radioactive over time in storage. It is also toxic, and has been connected to 'Gulf War syndrome'. It is shipped to Utah in casks and buried as such. I have heard no information about the lifetime of these casks. Doubtless that will depend upon conditions at the deposition site, which has been known to become flooded with salt water within historic time.

Radioactivity at any level is not healthful for biological systems. Increased rates of cancer in humans of all ages is attributed, in part, to radioactivity. Uranium has proved to be a cancer generator at all stages of its life cycle: mining, enrichment, nuclear plants, nuclear waste---and nuclear explosions.

The U.S. NRC classified DU as low level, Class A. But they now admit that DU is a special material requiring further study. A few years of more study. Perhaps enough time to allow the transfer of the whole pile DU waste pile to be transferred to Utah BEFORE their conclusions are reached.

I am grateful that the Utah Radiation Control Board has understood the need for Utah to look at this scenario

and understand that it is the RCB which must impose its own conditions for the receipt of DU. The EnergySolutions waste site at Clive needs careful reconsideration as a repository for DU.

Response

The commenter's support for the rule is noted. With respect to the specific technical concerns raised, please *see* Part F, Response No. 1.

Comment 26 (Cindy King)

Comment 26.1

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

GENERAL COMMENTS: Technical analysis needs to be transparent, scientifically defendable, 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 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." [footnote omitted]. 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."

(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 life span 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 phase "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.

Response

Thank you for your comments. However, the rule under consideration is R313-25-8(2), not R313-25-8(1). *See* Part A, Background, Part F, General Response No. 1, and Responses to Comments Nos. 27.2 and 31.2. It is not anticipated that there will be a formal peer review process. *See* Part F, General Response No. 2.

Comment 26.2

(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.

Response

Many of the comments address how a performance assessment should be performed and evaluated and public or peer reviewed. *See* Part A, Background, and Part F, General Response Nos. 1, 2 and 3.

The performance period provided by the rule is a minimum of 10,000 years. The Executive Secretary will evaluate the licensee's proposed compliance period, as well as any limits that may be placed on the disposal of depleted uranium during the course of the performance assessment process. Please note that there is no limitation on the length of time performance objectives must be met. Establishing a compliance period is part of the modeling process and, like the rest of the modeling process, is designed to represent expected conditions as closely as reasonably possible.

Comment 27 (Stephen Nelson, Charles Oviatt, Summer Rupper)

Note: Attachments to these comments are not included due to their length and, for the same reason, the entirety of this comment is not reproduced below, but are available for review at the Division of Radiation Control. The Executive Secretary responds to the entirety of these comments as follows.

Comment 27.1

Introduction:

The proposed revision to rule R313-25-8 is inadequate because it is insufficiently protective of the natural environment. In particular, the quantitative performance period in part (2) (a): i) is too short, and ii) a qualitative analysis to the time of peak dose (peak activity), is, by definition, insufficient to demonstrate performance of the system and relies on faulty logic.

We deal with ii) briefly here and in the remainder of this document the problems with i) are addressed. However, in addressing i), we demonstrate that, properly worded, ii) can and should be met with a quantitative analysis. We do this through two "contentions" that are followed with supporting analysis.

The problem with a "qualitative analysis for the period where peak dose occurs" is that "peak dose," both in its timing and magnitude, cannot be estimated without a quantitative model. Dose refers to human exposure. This may or may not occur when DU has reached maximum activity. If the Board means "peak activity," then the solution is simple. The rule must extend to 1 million years, which is not a new figure in the regulation of radioactive wastes (See Nelson et al.,2009; attached).

Before proceeding with our analysis, we note the language of parts of rule R313-25-8 that have not been

modified (except for numbering), but inform what the licensee must "demonstrate." (l) (a) includes exposure pathways in ground and surface water, including natural and engineered features of the site. (1) (d) includes "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." These criteria must be met within the context of the additional challenges posed by the disposal of large quantities of depleted uranium (DU).

Response

The Proposed Rule has been modified to clarify the intent that quantitative simulations must be performed for the period where peak dose occurs but the results are to be analyzed qualitatively. See Part B.3, above.

The term "peak dose" is retained, rather than use of the commenters' suggested term, "peak activity." Total activity cannot be directly translated into dose because different elements (daughter products) can have different mobility and radiotoxicity. *See, e.g.,* SECY 08-0147 at 2, 3. Therefore, an inadvertent intruder would be at greater risk of exposure at peak dose than at peak activity.

Comment 27.2

Contention 1: There is a high probability the site will flood, and that probability is so high such that rigorous, quantitative analysis is required.
[NOT reproduced are commenters multiple pages of technical discussion and figures, relying, in part, on the NRC technical review plan for Yucca Mountain, NUREG 1804; the potential for a disruptive flooding event at Clive; and the effect of climate change. Reproduced immediately below is the commenters' conclusion to Contention 1.]

Despite DRC staff statements, the site will flood in the future and the consequences cannot be ignored or subjected to "qualitative" analysis. The rule clearly calls for the consideration of natural processes in system performance, including ground and surface water effects on erosion and compaction of the piles. The rule, as previously written, was probably sufficient for short-lived conventional waste streams, but given the quantity of material and long-lived nature of DU, the revised rule is inadequate in terms of reasonable assurance of environmental protection.

Response

Most of the comments in Contention 1 are not pertinent to this rulemaking because they address the portion of the rule that was not proposed to be changed, *i.e.*, R313-25-8(1)(d) (as renumbered). The rule under consideration is R313-25-8(2). In any event, the specificity the commenters suggest may not be necessary to incorporate into a rule because the agency has discretion to ensure that any unanalyzed condition at Clive will be evaluated to determine whether it is protective of human health and the environment. Comments relating to a disruptive flooding event and the effect of climate change relate to how a performance assessment should be conducted. *See* Part A, Background, and General Response No. 1, above. *See also* General Response to Comment No. 39, No. 5; just as it is not appropriate for the agency to consider expert opinion that a standard will be met during the rulemaking process, it is inappropriate for the agency to consider expert opinion that a standard will not be met.

Comment 27.3

Contention 2: The consequences of flooding are unacceptable

***Erosion**: We are aware from the audio of the Dec. 3, 2009 Board Meeting that EnergySolutions intends to include flooding of the site in its performance evaluation. We do not contend that they will do so, but isn't the very notion of a submerged landfill, or a landfill at the shoreline of a large lake absurd at face value? Isn't the mere fact that this has to be accounted for in their evaluation an implicit admission that this is the wrong place for DU? As noted above: "the site must remain above the water table for the effective duration of the repository (USGS, 1989)."*

That said, we recognize that at least three factors related to flooding that must be accounted for. First, is enhanced seepage and complete saturation of the landfill interior. Second, the lake has the potential to reach the elevation of the Provo shoreline (4740 feet), where it will spill into the Snake River drainage. Thus, the performance evaluation

must also consider compaction, and compaction-induced failure of the liner and cap systems due to ~460 feet of overlying water.

The most serious issue is erosion of the piles. We consider their breach very likely. A lake at the elevation of Clive will have a large fetch (i.e., stretch of open water for waves to accumulate by blowing winds). For example, from the northwest there would be on the order of 50 miles of open water.

[Two pages of technical discussion and figures are not reproduced here.]

***DU Releases**: Now we consider the effects of the releases of DU into the lake system. For some of this discussion, we rely on a calculation by Prof. Gary Sandquist. Dr. Sandquist is a retired nuclear engineering professor from the U of U. The calculation was forwarded to one of us (Nelson) with his permission and we assume it is correct:*

- *Assuming 60,000 tons of DU are emplaced at Clive (49,000 tons that may be there already plus 11,000 tons from South Carolina), the concentration of uranium in the lake would be 0.25 ppm*
  - *This calculation assumes the lake reaches the elevation of Clive and that all uranium is dissolved in the lake.*

We believe this is a reasonable calculation, but it raises the question as to the ability of the lake to carry uranium concentrations this high.

UO_3 contains uranium in the 6+ oxidation state, which is relatively soluble. We understand that the South Carolina material is in powder form, which increases its reactivity due to a high surface area, and also increases its ability to be physically dispersed. We could perform solubility calculations for uranium using thermodynamically-based computer codes, but for simplicity we rely on a report from the Idaho National Engineering and Environmental Laboratory (INEEL, 2000). This report determined that in natural waters, the concentration of uranium in water passing through a 20 micron filter rapidly exceed 70 ppm and reached a steady-state of nearly 100 ppm after l-2 months. These experiments were conducted with U_3O_8. The conclusion is that an expanded lake would have a large capacity to dissolve uranium.

Sandquist's figure of 0.25 ppm is a lower bound based on may be already at the site, plus what is expected to arrive shortly. However, the Board is aware that the stockpile of DU requiring disposal may be as much as 1,400,000 tons by the middle of this century. Assuming the Clive site eventually contains 1,000,000 tons of DU, lake concentrations could reach4.2 ppm.

These may not sound like high concentrations. However, we compare them to the EPA limit for uranium in water of 0.03 ppm found at:

(http : //www. epa. gov/fedfac/documents/uranium_drinking_water_standards. htm)

At 0.25 ppm, the current inventory of DU at Clive could exceed safe levels in the lake by a factor of 8. At 4.2 ppm, the concentration could exceed safe levels by a factor of 140. Furthermore, the same EPA standard acknowledges that the toxicity of uranium as a heavy metal may exceed its radiological hazard.

We cannot answer the full range of questions surrounding the potential impacts on the ecosystem, such as bio-accumulation up the food chain, etc. But we can identify some processes that need to be considered. For instance, uranium in solution is probably its most bio-available form. and recession of the lake may leave soluble uranium salts in surface sediments.

Although there may be secondary processes that would attenuate uranium concentrations in the lake with time such as adsorption and burial on the lake bottom, or co-precipitation with calcite, our current understanding of these processes is very limited. However, there are a whole host of DU daughter products, some with long half-lives (^{230}Th 75,000 years; ^{234}U 245,000 years; ^{226}Ra 1600) years that may be present. Their mobility and fate must be considered as well and if significant time has passed between burial and release, their activities could approach that

of pure ^{238}U.

Finally, Figure 5 is fairly sobering. It illustrates the relative radioactivity of various waste products (y-axis) from the nuclear fuel cycle over time (x-axis). After 100,000 years the activity of DU is not much less than spent fuel and at 1,000,000 years they are nearly the same. There is a very good reason that the NRC is revisiting DU disposal and is taking its time to do so. [Figure 5 (mislabeled as Fig 4) is not reproduced here].

Response

Dr. Sandquist's calculation is reproduced under Comment No. 34 (Sandquist). The Executive Secretary acknowledges the above comments and notes he will await the outcome of the site specific performance assessment before making a decision on the suitability of the site for the disposal of depleted uranium. As to the technical discussion relating to erosion and DU releases, *see* Response to Comment 27.2 (Contention No. 1).

Comment 27.4

[Comments titled "Other Observations" and "Conclusion" are not reproduced here.]
Recommendations:

- *We recommend that the disposal of DU be prohibited at the EnergySolutions facility in Clive. However, if the Board proceeds to approve a rule, it must be strengthened, carefully considering comments provided.*
- *If the Board is concerned with the ability of any entity to conduct quantitative models in excess of 10,000 years, there is away around this problem:*
  o Assume that at the time of emplacement the entire inventory of DU is at its maximum activity.
  o Assume that at the time of emplacement concrete and steel containment has corroded.
  o Assume that the piles are impacted by waves for an extended period of time (500 yr.) at their midpoints between their tops and the surrounding grade.
  o Assume the piles are flooded to a depth of 460 feet (the elevation difference between Clive and the Provo shoreline) to evaluate enhanced seepage and release, as well as differential compaction and containment failure due to the hydrostatic load.
- *Since the Board wrote this rule, the Board directly should read and respond to public comment to ensure that the concerns of citizens providing input are heard.*
- *Empanel an independent group of experts to review the performance evaluation. This panel should include a diverse group of technical expertse and institutional affiliations. The large inventory and long-lived nature of DU make this issue too important to leave solely to DRC staff and contractors.*

Response

Thank you for your comments. The Executive Secretary acknowledges the above recommendations. *See* Response to Comment 27.2 (Contention No. 1). In response to bullet three, the Board has access to all public comments and this Comment Response document will be provided to all Board members in advance of the April Board meeting. *See* Part F, General Response No. 3 relating to the public comment process.

Comment 28 (Julie Harper)

I am a concerned citizen and an Environmental Studies major at the University of Utah. would like to state my disgust on the approval of storing nuclear waste in our beautiful state of Utah.

First of all I feel that we should not be the garbage dump for other states and countries just because we happen to have a lot of "empty" land. There isn't enough empty land on this planet to safely store this sort of waste and I

certainly do not want it in my backyard. Let South Carolina or Italy figure out where to store their own cancerous waste!

Secondly, I don't feel its safe to store this kind of waste in our desert....or anywhere for that matter. What happens if there is a big earthquake which is predicted? Or if the Great Salt Lake rises again? The areas where its planned they will be stored really are not that far from the millions of people along the Wasatch Front, especially if you consider the wind will blow it right to us! YOU LIVE HERE TOO!

Thirdly, I am so tired of everything being about money! What's more important, your family's health or money? Personally, I would take the health of my children and their children over a dollar any day! I didn't grow up here, but I have friends who did and many of them have had cancer before the age of 30! I can't help but wonder if it is the effects of nuclear tests in the West Desert, even this many years later.

Please don't let Utah become the world's nuclear waste dump! We are better than that!

Response

The request for a rule to ensure that no nuclear waste be stored or disposed of in Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the concern expressed about cancer and earthquakes, please *see* Part F, Response No. 1.

Comment 29 (Tim Wood)

I strongly oppose the importation and burial of depleted uranium in Utah. Utah should not become the nation's dumping ground for hazardous radiological waste and other toxic materials. Burying depleted uranium in Utah's west desert in an area that has historically been a flooded lake bed, makes little sense given that: (1) the waste will remain hazardous for thousands of years; and (2) it will convert slowly to a soluble oxide form over time.

What in the world is our state government thinking? Clearly, it is not thinking about future generations of Utahns who will have to deal with this problem. The proposed project is an outrageous example of the short-term thinking that is crippling our society. That burying depleted uranium in our west desert represents a workable solution to the radiological waste issue because "we'll be gone before it becomes a problem" is an irresponsible cop-out that smacks of back room deals between our state government and Energy Solutions. Energy Solutions may make a bundle in the short-term. But Utah's citizens will lose in both the short- and the long-terms.

Utahns, specifically Utah's Down Winders, have suffered in the recent past from irresponsible radiological "experiments" condoned and conducted by our government. It's time to remember the past and think hard and long-term about our future. If depleted uranium waste can be handled and stored safely, then it can be handled and stored elsewhere. There is nothing in this deal for Utahns in general. I strongly urge you to ban toxic and radiological waste from being imported and stockpiled in Utah.

Response

The commenter's request to ban toxic and radiological waste from Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2.

Comment 30 (Peter C. Burns)

I am writing to provide comment concerning the proposed rulemaking related to disposal of depleted uranium and aspects of the proposed performance assessment requirements. I am the Henry Massman Professor of Civil Engineering and Geological Sciences at the University of Notre Dame, and have been employed as a faculty member of the university for 13 years. I earned a B.S. (1988), M.S. (1990) and PhD, (1994) in geology prior to two years of post-doctoral research experience and one year on faculty at the University of Illinois. I have published more than 250 scientific papers, the majority of which deal with the mineralogy, geochemistry or structural chemistry of uranium. I have been the principle investigator on several Department of Energy and National Science Foundation

projects concerning uranium, and am currently Director of the Energy Frontier Research Center Materials Science of Actinides. My past research efforts included studies related to the proposed repository at Yucca Mountain and contamination of the subsurface with radionuclides at former weapons production facilities. I served as an expert panel member on two recent (fall, 2009) NRC round-table discussions on a proposed rulemaking concerning disposal of depleted uranium, and am currently a member of a National Academy of Sciences study panel examining nuclear waste forms. Full details of my background and scientific accomplishments/credentials can be found at petercburns.com

The safe disposal of depleted uranium (DU) is a unique challenge. Unlike class A wastes, it becomes more dangerous (radioactive) with time, with a peak radioactivity occurring after about 1,000,000 years (due to the ingrowth of daughter products). Uranium is also a toxic heavy metal, which presents a risk in addition to that associated with its radioactivity. Shallow landfill disposal presents numerous pathways for release of radioactivity into the environment. I consider it unwise to dispose of DU in landfills, but will restrict my comments to the specific rulemaking you contemplate.

With the details depending on the specific form of uranium, it is rather soluble in oxygenated (above the water table) groundwater, and transport of uranium through the vadose zone into the groundwater table can be rapid under some geologic conditions. The rate of transport through the natural environment depends on several factors that are difficult to quantify and that vary through time. Although much of the performance assessment modeling associated with disposal of DU tends to emphasize the radon risk, leakage of uranium into groundwater and surface water poses a considerably larger and longer-term risk to the biosphere and humanity. It is easier to focus on the radon risk, which is only relevant for individuals located near the emplaced waste due to the short half life of the isotope. I contend that the much larger risk is contamination of groundwater and surface water with dissolved uranium, as this can impact an entire watershed.

The maximum peak risk (dose) associated with disposal of DU will occur in the distant future, on the order of 1,000,000 years. The proposed regulatory time frame of 10,000 years does not capture this expected peak dose, but may be defensible relative to the viability of the calculations and models, and the defensibility of models that extend beyond that time frame. I applaud the proposed wording that requires at least a qualitative assessment of risk to peak dose, as this will necessarily address such factors as climate change.

Performance assessment models can be substantially flawed by incorrect assumptions, omissions, errors in fact, lack of understanding of the operative processes, or even intentional biasing. As such, my primary recommendation to the Board is that a robust system of peer review be established for the examination of any performance assessment intended to support the disposal of DU. Specifically, I am recommending that upon receipt of an application for a disposal license with the supporting documentation and performance assessment models, the government of Utah seek a review of the performance assessment models. This review should be conducted by a team of scientists/engineers who are independent of the company seeking license, the government of Utah, the NRC, and the various other stakeholders.

I propose that the peer review be conducted by a panel of about six individuals spanning the disciplines of geochemistry, hydrology, climate change, geomorphology, geotechnical, and health physics. The panel should be specifically charged with the detailed review of the model with an emphasis on at least the following:

- *the validity of models of physical and chemical processes*
- *the validity of bounding assumptions*
- *errors and/or omissions*
- *areas of uncertainty that exceed the model's claims*
- *the details of implementation of the model (computer code, etc.)*

I suggest the peer review panel be given six months to provide a report that would be submitted to the government and that would be a public document. The company could then respond to any issues with a revised performance assessment if they deemed it appropriate, and the government could proceed to a decision on the issue of licensing. The six-month delay this peer review would cause seems warranted when it is weighed against the potential consequences of poor decisions relative to the environment and public trust.

Response 30. The Executive Secretary notes your support for a qualitative assessment of risk to peak dose. *See also* Response 27.1. Comments relating to how a performance assessment should be conducted and evaluated, *see* Part A, Background, and Part F, General Response No. 1

and 3. It is not anticipated that there will be a formal peer review process. *See* Part F, General Response No. 3.

Comment 31 (David C. Kocher)

Comment 31.1

I am hereby submitting comments on the proposed amendments to Section R313-25-8, Technical Analyses, in the State of Utah's License Requirements for Land Disposal of Radioactive Waste -- General Provisions. To provide some background information, I served as an invited expert at the U.S. Nuclear Regulatory Commission's Public Workshop on Unique Waste Streams Including Depleted Uranium that was held in Salt Lake City on September 23-24, 2009. For many years, I served on teams of technical experts that prepared performance assessments for disposal of low-level radioactive waste at two U.S. Department of Energy (DOE) sites (Oak Ridge and Savannah River), and I also served on a panel of DOE contractors that provided advice to DOE on matters of conduct of performance assessment and development of appropriate regulatory requirements. Important elements of that panel's advice are incorporated in DOE's current waste management order as it applies to disposal of low-level waste. Although I am not a resident of the State of Utah, I have been encouraged by a resident who was also an invited expert at the workshop last September to submit comments on the proposed amendments to regulations that would apply to disposal of depleted uranium. My comments, which are concerned with the proposed paragraph (2)(a), are as follows.

[1] The new provision in paragraph (2)(a) should include a statement about "reasonable assurance" of compliance with applicable performance standards, similar to statements about "reasonable assurance" in existing regulations in paragraph (1) and its subparagraphs.

Response

A licensee required to perform a performance assessment must also comply with paragraph 1 of the existing rule, which requires "reasonable assurance" that the performance objectives will meet. R313-25-8(1)(a-d). A change to add "reasonable assurance" to paragraph 2(a) is not necessary.

Comment 31.2

[2] The proposed requirement that a performance assessment shall demonstrate compliance with performance standards in 10 CFR 61 and corresponding provisions of Utah rules when all disposed waste is taken into account, including waste already disposed of and proposed disposals of depleted uranium, raises an important question about the required scope of a performance assessment.

I am not familiar with Utah rules. However, as I'm sure the State understands, the numerical performance standards for waste disposal in 10 CFR 61 are concerned only with limiting potential radiation doses to off-site members of the public. Therefore, site-specific performance assessments basically need to be concerned only with potential releases of radionuclides beyond the boundary of the disposal facility. There is no requirement in 10 CFR 61 to assess potential impacts on inadvertent intruders who might come onto the disposal site at some time after an assumed loss of institutional control. Rather, protection of inadvertent intruders is handled in 10 CFR 61 by means of the generally applicable waste classification system, which includes limits on concentrations of specific radionuclides in Class A, B, and C wastes and technical requirements for disposal of waste in each class that apply at any licensed disposal facility. The concentration limits for the different waste classes were based on analyses of scenarios for inadvertent intrusion, with a scenario for a resident homesteader generally providing the basis for the limits for longer-lived radionuclides.

The generally applicable waste classification system in 10 CFR 61 has important implications for disposal of depleted uranium. Uranium is not included in the list of radionuclides for which concentration limits on Class A and

C wastes are specified. Therefore, depleted uranium in any concentrations and quantities is included in Class A waste, which has the least stringent disposal requirements. This approach to classifying depleted uranium (and other forms of uranium) was taken because the U.S. Nuclear Regulatory Commission (NRC) believed that there would be little uranium in low-level waste intended for disposal in licensed facilities. However, NRC did include concentration limits for depleted uranium in its proposed 10 CFR 61. The proposed rule specified a Class C limit for depleted uranium of 0.05 microcuries per cubic centimeter. This concentration limit is roughly 60 times less than the concentration of undiluted depleted uranium.

It is evident (at least to me) from the proposed concentration limit for depleted uranium in 10 CFR 61 that large quantities of depleted uranium would not qualify as Class A waste if a intruder dose assessment were required and may not even qualify as Class C waste. Whether or not depleted uranium would be Class C waste probably depends on the kinds of scenarios for inadvertent intrusion into disposed waste that would be considered reasonable for the purpose of setting a concentration limit. For example, if only drilling through the waste, but not excavation into a large volume of waste, were considered credible, which would be reasonable if disposal well below the ground surface were required, and the disposal limit for Class C waste were allowed to be 10 times higher than the limit for Class A waste based on consideration of the likelihood of occurrence of an assumed intrusion scenario, as is the case in 10 CFR 61 as promulgated, it is possible that depleted uranium could be classified as Class C waste.

The point of these remarks is that the State of Utah should carefully consider whether there needs to be a requirement for disposal of depleted uranium that a performance assessment shall also consider potential exposures of future inadvertent intruders and whether there should be a numerical performance standard for protection of inadvertent intruders (a limit on effective dose equivalent of 500 mrem per year, for example). Such requirements would go beyond what is required in 10 CFR 61. If such a requirement were instituted, the State would need to consider the important issues of disposal requirements for depleted uranium, an appropriate numerical performance standard, and definition of credible intrusion scenarios. Not to address protection of inadvertent intruders in some way would seem to me to be irresponsible, given that large volumes of depleted uranium most certainly would not qualify as Class A waste on the basis of analyses used to establish the waste classification system in 10 CFR 61 and may not even qualify as Class C waste.

Response

The Executive Secretary acknowledges that the rules do not provide a numeric performance standard for protection of the inadvertent intruder. *But see* Response 27.2. As to the suggested 500 mrem per year effective dose for inadvertent intrusion into Class C disposed waste, the Executive Secretary notes where there is no available rule, it is common for the agency to look to rules that apply in analogous situations. Comments relating to how a performance assessment should be conducted and evaluated, *see* Part A, Background and Part F, General Response No. 1.

Comment 31.3

[3] Finally, I would like to comment on the last two sentences in paragraph (2)(a), which address the compliance period and the need for an analysis that extends to the time of peak projected dose. These provisions are of critical importance for disposal of depleted uranium because, as everyone is aware, the radiological hazard of uranium increases with increasing time to about 1 million years, due to ingrowth of Ra-226 and its short-lived decay products, especially Rn-222. The increase in hazard amounts to orders of magnitude compared with the hazard from depleted uranium today.

First, I am concerned about the wording that the compliance period "will be a minimum of 10,000 years." The use of "minimum" here leads to a vague specification of the performance period. In my view, the performance period needs to be clearly and unambiguously stated in the regulation, although a less satisfactory approach would be to include guidance with the regulation to indicate how the compliance period might be determined. But, in general, licensees need specific requirements, not vague and ambiguous statements. This would also benefit decision makers.

Response 31.3.

Please *see* Response to Comment No. 26.2.

Comment 31.4

Second, I do not understand how simulations beyond the performance period "will be performed for a qualitative analysis for the period where peak dose occurs" ("qualitative" is the problem). Simulations would produce quantitative results (whether they are credible is another matter entirely). Perhaps what is intended here is that quantitative simulations would be used to render some kind of qualitative judgment about performance at far future times. Regardless of the intent, however, I do not believe that the meaning of this statement is clear.

Third, related to the previous point is the following issue: How will the State use results of an analysis beyond the compliance period (whether it is qualitative or quantitative) in making a judgment about whether disposal of depleted uranium is acceptable? It seems to me that the regulations, or perhaps an accompanying guidance document, need to give some indication of how results of such an analysis will be used in deciding on the acceptability of disposal of depleted uranium.

Response

Comments by Nelson *et al.* raise a similar point. *See* Response to Comment 27.1 above.

Comment 31.5

[4] I would say in closing that depleted uranium poses special problems in regard to protection of inadvertent intruders and the time frame for compliance with regulations that NRC clearly will need to deal with in revising its regulations to accommodate disposal of this material. There are no obvious precedents for dealing with this kind of waste.

Response

Thank you for your comments.

Comment 32 (Dobres M Johnson)

The focus of your Board as to the protection of our citizens and future generations concerning radiological exposure and contamination is critical. I therefore support the Board's efforts to establish a new ruling, which would ensure that no depleted uranium shipments arrive in our state prior to the completion of exhaustive public health studies and performance assessments.

A new rule should include the provision for the disclosure of level of peak dosage, as will as potential geological processes, i.e. flooring and erosion.

Response

The commenter's support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 33 [reserved]

Comment 34 (Gary M. Sandquist)

I have responded to Stephen Nelson (BYU Geochemist) recent statement concerning the impact of a dramatic rise of the Great Salt Lake (circa 50,000 years) upon the integrity and dissolution of depleted uranium (DU) in encroaching waters impacting the Clive Disposal Site.
Attached is a calculation entitled "Analysis -Uranium in expanding GSL that intercepts Clive Site"
The conclusion of the analysis utilizing USGS and Utah Geological Survey Data and References [is presented in the analysis below]
ANALYSIS. URANIUM IN EXPANDING GSL THAT INTERCEPTS CLIVE SITE (Gary Sandquist)
About 49,000 tons of DU are stored in Clive and an additional 11,000 tons of DU are awaiting storage for a total inventory of 60,000 of DU.
This material is disposed of at Clive at a minimum depth of 10 feet below top of cell,
The current elevation of GSL is 4194 ft above sea level and has a water volume of about 11 million acre feet within an area of 969 square miles. (UT Geological Survey Data)
The elevation of Clive site is 4288 feet or 94 feet above current level of GSL.
(Data source: U.S. Geological Survey Maps, GSL and Clive-Aragonite.
If GSL is inundated and a return of Lake Bonneville occurred then water level at 4288 feet would provide a surface area of about 4500 sq miles (UT Geological Survey Data Topographical Maps)
So total area for expanded lake = 4500 sq miles + 969 sq miles = 5400 sq miles
Total water volume for this = 1.7 E8 acre-ft (added water) +11E6 acre-ft (present GSL) = 1.8 E8 acre-ft
1.8 EB acre feet x 43,560 cubic feet/acre-feet = 7.8 E 12 cubic feet
Water has a density of 0.031 tons/cu ft
So water mass in this expanded GSL = 7.8 E 12 cubic feet x 0.031 tons/cu ft = 2.4 E11 tones
Clive disposal of DU is 60,000 tons so = 60,000 (tons DU)/2 .4 E1I (tons H2O) = 0.25 ppm U in water.

If GSL expands to reach Clive Site total possible dissolved U in water is 0.25 ppm DU in water.
Average Utah soil contains 2.8 ppm of natural U or 11 times more U than water from rising GSL that reaches Clive Site. (Note: DU has about 60% radioactivity of natural U)
Even if entire US inventory of DU (estimated at ~600,000 MT) were disposed at Clive then maximum possible U content in this expanded GSL would be 2.5 ppm or still less than UT soil average.
Worldwide average uranium content is 3 ppm in soils, deep sea clays, and stream sediments.
However. DU metal is insoluble in water as are oxidized products of DU, viz. UO2 & U3O8.
U normally exists as deposits of insoluble sediments in water bodies.

Physical Characteristics of Uranium Compounds (CRC Handbook Chemistry & Physics)

Compound	Melting Point (°C)	Crystal Particle (Density (g/cm^3))	Bulk (Density (g/cm^3))	Solubility in Water at Ambient Temperature
U_3O_8	Decomposes to UO2 at 1,300	8.30	1.5 - 4.0	Insoluble
UO_2	2,878 ± 20	10.96	2.0 - 5.0	Insoluble
Uranium metal	1,132	19.05	19	Insoluble

Counter to popular belief, main risk of exposure to DU (or natural U) is chemical hazard from uranium oxide rather than radioactivity. A microgram of U in body has an alpha activity of less than 1 disintegration per minute (uranium is a very weak alpha emitter).

Response

The calculation presented in this comment is the one referred to in Comment No. 27.3 from Nelson *et al.* Both sets of commenters arrive at different conclusions as to the effect of depleted uranium disposal on the Great Salt Lake. However, the comments relate to the evaluation of a performance assessment and are not specific to the Proposed Rule. *See* Part A, Background, and Part F, General Response No. 1.

Comment 35 (Kira Kilmer)

My comments address responsibility of policy makers to anticipate all aspects of your decisions regarding the importation of uranium materials..

1. Energy Solutions may not last as long as the problems they create. Lehman Brothers and Enron would not have anticipated their own demise. The responsibility for mitigation of problems could fall to Utah, or to all taxpaying US citizens if Superfund Clean-up funds are necessary – do we want bigger or smaller government? Is it fair to gloss over problems and expect taxpayers to bail you out? Would "clean-up" even be possible? What if an aquifer were contaminated?

2. Energy Solutions is not going to advertise their own shortcomings just as the tobacco or sophisticated industry told us cigarettes tasted good and were either masculine or sophisticated but did not admit the cigarettes were addictive and that use exposed smokers to carcinogens.

3. Storage is only one of several concerns. What about transportation? Carrying containers across the country exposes all those along the route to potential contamination, either by intentional spilling or accidental hazard. In Salt Lake the train route goes through the heart of the city. Can you afford an accident or terrorist incident in our metropolitan center? Would you want an incident in any other city or rural farmland?

4. What about worker exposure to toxic materials? The Energy Solutions executives will sit at their desks, but the so called jobs they create may come with the inherent risk of deadly exposure should any containers fail or should there be workplace errors in handling the containers.

5. And finally, should not you, the legislature, the governor and all of us as the society who support you, be thinking of the final results. To meet our growing energy needs, should we agree to working with poisons or look to sources that are sustainable and non-toxic? Do we want mercury in our air, uranium in our dust and possibly in our water, or should we push ahead with solar, wind, geothermal energy sources, and conservation, while our research teams try to solve the known negative consequences of nuclear materials and coal.

We ask the coca growers in Colombia to give up a chance for income, we ask the opium growers in Afghanistan to grow grain at much lower profits, surely we can ask ourselves: are a few jobs worth the risk of accident, risks to employee and citizen health and potential damage to our environment?

Response

The commenter appears to be requesting an end to the disposal of radioactive waste in Utah, which is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. The Board does not have jurisdiction over transportation matters; those comments are also beyond the scope of this rulemaking. The comments regarding environmental concerns generally are relevant to the performance assessment. Please *see* Part F, Response No. 1.

Comment 36 (U.S. Nuclear Regulatory Commission)

Comment 36.1

We have reviewed the proposed changes to the Utah regulations R313-25-8, received by our office on January 6, 2010. These regulations were reviewed by comparison to the equivalent Nuclear Regulatory Commission (NRC) rules in 10 CFR Part 61. We discussed our review of the regulations with you on January 21, 2010.

As a result of our review, we have three comments that have been identified in the enclosure. Please note that we have limited our review to regulations required for compatibility and/or health and safety and the identification of program elements that create conflicts, duplications or gaps in the orderly pattern of regulations on a nationwide basis (See the 1997 Policy Statement on Adequacy and Compatibility of Agreement State Programs).

Under our current procedure, a finding that the Utah's regulations meet the compatibility and health and safety categories of the equivalent NRC regulation may only be made based on a review of the final Utah regulations. However, we have determined that if your proposed regulations were adopted, incorporating our comments and without other significant change, they would meet the compatibility and health and safety categories established in the Office of Federal and State Materials and Environmental Management Programs (FSME) Procedure SA-200.

We request that when the proposed regulations are adopted and published as final regulations, a copy of the "as published" regulations be provided to us for review. As requested in FSME Procedure SA-201, "Review of State Regulatory Requirements," please highlight the final changes, and provide a copy to Division of Materials Safety and State Agreements, FSME. The SRS Data Sheet summarizes our knowledge of the status of other Utah regulations, as indicated. Please let us know if you note any inaccuracies, or have any comments on the information contained in the SRS Data Sheet. This letter, including the SRS Data Sheet, is posted on the FSME website: http://nrc-stp. ornl.gov/rulemaking.html.

Response

Thank you for your comment.

Comment 36.2

The NRC would also like respond to the Statement of Basis for Administrative Rulemaking, dated December 1, 2009 which is part of the December 8, 2009 Radiation Control Board Information Packet as posted on your website and e-mailed to Duncan White on December 10, 2009. The Statement notes that the Utah Radiation Control Board "intends to issue a determination . . . about whether there are 'corresponding federal regulations that are not adequate to protect public health and the environment of the state." Statement of Basis at 11.

The Statement of Basis also concludes that NRC has recognized "the inadequacy of its current regulations." Statement of Basis at 8. Your characterization of NRC's regulations and conclusions regarding their adequacy is in error. Although the current regulations did not consider the disposal of significant quantities of depleted uranium, they are adequate to ensure the protection of the public health and safety. The requirements in 10 CFR Part 61 Subpart C provide the performance objectives that all disposal facility licensees must comply with before disposing of any low-level radioactive waste. The NRC's recommendation to update a site's performance assessment prior to disposal of significant quantities of depleted uranium would ensure that the licensee continues to comply with these requirements; a recommendation to ensure compliance with the existing regulations does not indicate that the regulations are inadequate.

The NRC's rulemaking effort will clarify these requirements and provide additional guidance to licensees and the Agreement States that are dealing with the disposal of unique waste streams, but engaging in a rulemaking to update the NRC's regulations does not mean that the current regulations are inadequate to protect the public health and safety while rulemaking is pursued to improve the regulations.

Response

The Executive Secretary agrees that, given the requirements in 10 CFR Part 61 Subpart C that all disposal facility licensees must comply with NRC Performance Objectives before disposing of any low-level radioactive waste, NRC's regulations and Utah's equivalent rules are adequate to protect public health and the environment of the state. *See* Part C and D, above.

Comment 37 (Douglas A. Barnes)

As a Utah native, I expect our state officials to protect citizens and future generations from the threat of radioactive waste, exposure and contamination. I support the Board's commitment to create strong policies and laws that guarantee citizens that no depleted uranium comes into our state - without first completing rigorous public health studies, along with thorough assessments of all entities involved. A bulletproof new rule is essential to protect citizens and future generations from the future hazards posed by depleted uranium. This new rule must include projections for peak exposure timelines, and the threats to our population posed by statistically significant seismic activity and flood scenarios.

Response

The commenter's support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 38 (Colleen K. Barnes)

As a Utah resident and business owner, I expect the DEQ to protect the people of Utah, business development, tourism, and future generations from the threat of radioactive waste, exposure and contamination.

I support the Board's commitment to create strong policies and laws to guarantee the people of Utah that no depleted uranium comes into our state - without first completing rigorous public health studies, along with thorough assessments of all entities involved in the storage transaction. A new rule is urgently needed; and it must include projections for exposure timelines, as well as the threats to our population and enterprises posed by statistically significant seismic activity and flood scenarios. Please take a strong stance in favor of rigorous hearings, scientific assessment, and new legal guidelines regarding depleted uranium. Please also move forward quickly with a thorough review of ALL parties engaged in the approval process, transfer, and storage of radioactive and hazardous waste in Utah. It's shocking that no rule currently exists to protect tax-payers, businesses, and generations-to-come from all present and future hazards posed by the ultimate storage of 700,000 tons of depleted uranium. In a down economy, do we really want state business development shackled to the "radioactive Utah" brand?

Response

The commenter's support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment 39 (EnergySolutions)

Note: Some of these comments have been excerpted due to their length. The Executive Secretary responds to the entirety of these comments as follows.

General Response to Comment No. 39

Because there is a core group of comments and assumptions that are interspersed several times throughout EnergySolutions' comments, an initial general response is appropriate.

1. The Executive Secretary agrees that NRC Performance Objectives, if met, are protective of public health and safety. The purpose of the Proposed Rule is to require a licensee to demonstrate that the facility will meet NRC Performance Objectives.

2. EnergySolutions has urged that the Proposed Rule is not necessary because a licensee is required to demonstrate at licensing that it will meet NRC Performance Objectives. Implicit in this comment is an assumption that it is inappropriate to require a current demonstration. The Executive Secretary does not agree with that assumption in light of:

- New guidance from NRC, associated with SECY-08-0147 and NRC's depleted uranium rulemaking process about how to conduct a meaningful performance assessment.[4]
- A clearer understanding of the critical role played by the performance assessment for disposal of depleted uranium since NRC has acknowledged that, in the absence of a performance assessment, disposal of depleted uranium is an unanalyzed condition. This is so because the waste classification alone is not sufficient protection for disposal of significant quantities of depleted uranium. (*See* Statement of Basis and Part A, above.)
- Specific recommendations from NRC that the current performance assessments be reviewed. (*See* General Response to Comment 39, No. 3.)

3. The NRC and its staff have recommended that any performance assessment be reviewed before disposal of significant quantities of depleted uranium. For example, in NRC SECY-08-0147 (Oct. 7, 2008) (hereinafter "SECY-08-0147"), "Staff recommends conducting a limited rulemaking to revise Part 61 to specify the <u>need for a disposal facility licensee or applicant to conduct a site-specific analysis</u> that addresses the unique characteristics of the waste and the additional considerations required for its disposal <u>prior to disposal of large quantities of DU</u> and other unique waste streams such as reprocessing waste." (*emphasis added*). The SECY-08-0147 was adopted by Nuclear Regulatory Commission by Order dated March 18, 2009.[5]

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[4] The commenter also acknowledges that approval of a new performance assessment that meets current guidance will be a significant undertaking. *See* EnergySolutions' Comment No. 39.6.

[5] *See also* Comments of Larry Camper at NRC's Unique Waste Streams Rulemaking Record, Workshop 1, Day 1 (Sept. 2, 2009), tr. at 45, http://www.nrc.gov/about-nrc/

4. The disposal of depleted uranium is an important question that should be subject to a renewed demonstration at this time, as described above. The studies the commenter wants considered for this rulemaking have not been provided to the Executive Secretary for review and approval and have not been made available to the public for public comment. It is not appropriate to rely on them in a rulemaking action or to use the rulemaking process as a short-cut for agency and public review of the performance assessment process. Careful review of a performance assessment will take time, as EnergySolutions' own experts have recognized in Comment No. 39.6.

5. The Executive Secretary does not agree with EnergySolutions' suggestion that the Board consider, as appropriate evidence of compliance, the opinions of experts that future submissions will demonstrate that NRC's Performance Objectives will be met.

In addition, the assertion that the performance assessment will demonstrate compliance assigns a role to the performance assessment that that study cannot play. As NRC's lead performance assessment model for the SECY-0147 has stated:

> [A performance assessment] can provide a lot of insights to decision makers, but performance assessments do not make your decision for you. Decision makers make your decision.[6]

A decision that is informed by a performance or other kind of risk assessment involves an interplay between information provided in the assessment about how much risk and uncertainty there is, and determinations made about how much risk and uncertainty are acceptable. That interplay becomes more complex as the uncertainty in a technical analysis becomes greater.

There are many decisions that EnergySolutions will make as it writes a performance assessment: whether the period selected for a quantitative assessment is sufficient to understand the long-term trends for the site; what assumptions to make about human use of the area far into the future; what assumptions to make about the area's climate in the future; and what assumptions should be made about geomorphological changes. All of these matters and many more were the subject of four days of discussion before the NRC during its Unique Waste Streams Workshop, initiated in support of its rulemaking process. Very little consensus was reached about how to approach any of them. Because the Executive Secretary will be making his decision in advance of NRC's rulemaking process, he will face many of the same difficulties. These decision points, and many more, are complex and it should not be assumed that the outcomes will be the same choices that EnergySolutions has made.

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regulatory/rulemaking/potential-rulemaking/uw-streams/workshop-1-transcripts-day1.pdf. and *id*, Workshop 2, Day 1 (Sept. 23, 2009), tr. at 40.

[6] NRC's Unique Waste Streams Rulemaking Record, Workshop 1, Day 1, *supra* n. 5, tr. at 77 (September 2, 2009).

Finally, one important purpose of the performance assessment is to inform the waste disposal process. If the performance assessment identifies specific conditions under which disposal should occur (e.g., grouting or not grouting the waste, need to treat waste before disposal) that information should be available when the waste is disposed. *See* EnergySolutions Comment No. 39.29: "Site-specific analyses are very useful not only for understanding site performance, but enhancing site performance."[7]

6. The Proposed Rule imposes the same kind of restriction that is found in countless regulatory and license requirements to which any licensee is subject: it requires that before the licensee can undertake an activity, it must demonstrate that activity is safe. This is the normal regulatory process, not a moratorium. The timing of the submission of a performance assessment is in the licensee's hands. *See also* General Response to Comment No. 39, Comment No. 2 regarding timing of the performance assessment.

7. The Executive Secretary does not believe it is appropriate to rely on a licensee's ability to mitigate disposal in order to approve disposal before it has been adequately studied. Allowing an activity to occur before approval, even if it at the licensee's risk, is not appropriate since changing the status quo could prejudice the outcome of an agency's determination. This is recognized in many other rules that prohibit construction before approval of a facility. See, for example, R313-24-3(2), which provides "[c]ommencement of construction prior to issuance of the license or amendment shall be grounds for denial of the license or amendment."

In addition, one of the purposes of a performance assessment is to establish appropriate disposal conditions. Those conditions should be established prior to disposal. See General Response to Comment 39, No. 5.

Finally, it is not a foregone conclusion that the agency will approve a performance assessment. That decision and the conditions under which depleted uranium disposal may occur (*e.g.*, disposal depth, quantity limits, etc.) will be made after the agency has received and evaluated the totality of the submissions from a licensee.

8. The Executive Secretary does not agree that the agency should only consider near-term risk from disposal of depleted uranium. A licensee has an obligation to demonstrate that NRC Performance Objectives will be met generally, not just for the short term.

9. It is not appropriate for the agency to presume that specific conditions that a licensee agrees to meet – a 10 foot disposal depth, for example – will be sufficient absent an approved performance assessment. An approved performance assessment may also include additional

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[7] *See also* SECY-08-0147, Encl. 1 at 10 ("Because site-specific waste management decisions or other variables can strongly influence whether performance objectives can be met, care should be taken not to take the model results out of the analysis context.").

restrictions. The agency also cannot presuppose that the performance assessment will demonstrate that NRC Performance Objectives will be able to be met at the site. *See* General Response to Comment No. 39, No. 7.

Comment 39.1

EnergySolutions has reviewed the proposed rule regarding depleted uranium ("DU") published for comment by the Radiation Control Board (the "Board") on January l, 2010 (the "Proposed Rule"). EnergySolutions opposes adoption of the Proposed Rule for the following reasons:

1. *The Board has failed to recognize and acknowledge that there are existing federal regulatory requirements that ensure the safe disposal of DU at EnergySolutions' LLRW facility at Clive, Utah (the "Clive Facility").*
2. *In failing to do so, the Board has violated the "no more stringent" statute of the Utah Radiation Control Act.*
3. *The location of the Clive Facility and the DU disposal methods used there are suitable and protective of public health and the environment.*
4. *In the highly unlikely event that DU disposal at the Clive Facility is shown to pose risks to public health and the environment, mitigation measures are available to eliminate such risks.*
5. *There are legal arguments and public policy considerations to demonstrate that the Proposed Rule violates applicable law, exceeds the Board's authority, and contravenes sound public policy.*
6. *Therefore, the Board has failed to demonstrate that the Proposed Rule is needed to protect public health and the environment of the State of Utah.*

In the following sections of its comments, EnergySolutions elaborates on the technical, legal, and public policy objections identified above. In so doing, EnergySolutions relies upon the judgment of several widely acknowledged experts. Each of these experts brings particular expertise to questions raised by the Proposed Rule.

The first point raised as an objection deserves special emphasis because it most clearly illustrates the shortcomings of the Proposed Rule. Under Utah law, the Board "may not adopt rules" that are "more stringent than the corresponding federal regulations which address the same circumstances" unless "it makes a written finding after public comment and hearing and based on evidence in the record that corresponding federal regulations are not adequate to protect public health and the environment of the state." The Board does not base the Proposed Rule on any independent judgment or analysis showing that the current regulations of the Nuclear Regulatory Commission ("NRC") are inadequate to protect public health and the environment. Instead, the Board attempts to justify the Proposed Rule by suggesting that there are no comparable federal rules in place and that the NRC has recognized "the inadequacy of its current regulations."

This clearly is not the case. The NRC has unequivocally declared to this Board that

> *Your characterization of NRC's regulations and conclusions regarding their adequacy is in error. Although the current regulations did not consider the disposal of significant quantities of depleted uranium, they are adequate to ensure the protection of the public health and safety.*

Letter from Terence Reis, Deputy Director, Division of Materials Safety and State Agreements, Office of Federal and State Materials and Environmental Management Programs, Nuclear Regulatory Commission, to Dane L. Finerfrock, Utah Division of Radiation Control ("DRC"), dated January 21,2010 ("These regulations were reviewed by comparison to the equivalent Nuclear Regulatory Commission rules in 10 CFR Part 61."), attached as Exhibit A.

This clear and unambiguous declaration by the NRC - the federal agency with jurisdiction over the regulation of radioactive waste - on its own demonstrates that there is no legal basis for the Proposed Rule. As such, the Proposed Rule should not be adopted by the Board.

Additionally, EnergySolutions believes that the Board has failed to support the Proposed Rule with a legally sufficient "reason for the change." The Board has also failed to produce "public health and environmental information and studies" that provide justification for the Proposed Rule.

BACKGROUND

Interest of EnergySolutions. EnergySolutions operates the Clive Facility, a LLRW disposal facility, pursuant to a license issued by the DRC and in accordance with applicable statutes and rules (the "License"). The License authorizes EnergySolutions to "receive, store, and dispose by land burial, radioactive material as naturally occurring and accelerator-produced material (NARM) and low-level radioactive waste." License Condition 9.A.

DU is within the universe of materials authorized for disposal by the License. DU also meets the criteria for Class A LLRW under the existing rules of the DRC. UAC R313-15-1008.

Proposed Rule. EnergySolutions hereby submits its comments on the Proposed Rule and the accompanying "Statement of Basis for Administrative Rulemaking Regarding Disposal of Significant Quantities of Depleted Uranium" ("Statement of Basis"). The Notice of Proposed Rulemaking (Amendment), DAR File No. 33267, dated December 14, 2009 (the "Notice"), was published in the Utah State Bulletin on January l, 20l0, attached as Exhibit B.

Omission of Statement of Basis from the Notice. The Statement of Basis was not published in the Utah State Bulletin. Rather, the Notice stated that the Statement of Basis was posted on the DRC's website, but a search of the website did not show it. EnergySolutions was able to obtain a copy of the Statement of Basis directly from the DRC. Other interested parties and members of the public who may want to submit public comments have not been able to obtain and review the Statement of Basis. As a result, the opportunity afforded interested parties and members of the public to submit public comments has been inadequate and the scope and quality of the comments on the Proposed Rule will be diminished.

Public Comments Submitted bv EnergySolutions. EnergySolutions has assembled a technical team to prepare technical reviews which are summarized below (collectively, the "Technical Reviews"). The Technical Reviews support the conclusion that existing NRC regulations are sufficient to protect public health and the environment, with the result that the Proposed Rule is not needed and does not satisfy the criteria in Utah Code Ann. § l9-3-104(8) and (9). The experts whose reports and analyses comprise the Technical Reviews are:

- *Talisman. Talisman International, Inc. ("Talisman") is an international nuclear engineering firm located in Washington, D.C. Talisman advises commercial nuclear power reactors, fuel cycle facilities, and high-level and low-level radioactive waste generators and disposal facilities regarding all aspects of licensing and operations. Most of the employees of Talisman are former senior managers at NRC, the U.S. Department of Energy ("DOE"), and utility companies. Talisman's technical review is attached as Exhibit C.*
- *Neptune. Neptune and Company, Inc. ("Neptune") is an environmental consulting firm headquartered in Los Alamos, New Mexico. Neptune specializes in planning, design, and analysis of environmental data in support of decision making and risk assessments involving the management and disposal of high-level and low-level radioactive waste. Neptune has extensive experience with preparing performance assessments at a variety of facilities, including the Nevada Test Site, Los Alamos National Laboratory, and Savannah River Site. Neptune has been engaged by EnergySolutions to prepare the performance assessment ("PA") for the Clive Facility. Neptune's technical review is attached as Exhibit D.*
- *Enchemica. Enchemica, LLC's ("Enchemica") chief scientist, Dr. Janet Schramke, PhD, located in Loveland, Colorado, has over 26 years of professional experience in the fields of geochemistry and environmental chemistry, and is a former Senior Research Scientist at the DOE's Pacific Northwest National Laboratory. Dr. Schramke has considerable experience evaluating issues related to low-level, high-level and transuranic radioactive waste disposal, and has been engaged by EPA's Office of Radiation and the New Mexico Environment Department to provide numerous technical evaluations of the Waste Isolation Pilot Plant. She also served as part of the Yucca Mountain Project License Application Review Team for Sandia National Laboratory, providing senior-level reviews of portions of the Safety and Analysis Report submitted to the NRC. Enchemica's technical review is attached as Exhibit E.*

Response

With one exception, each of these comments is more fully stated in the remainder of EnergySolutions' comments and is responded to through those comments.

The exception is the comment regarding the availability of the Statement of Basis. The Executive Secretary does not agree that the Statement of Basis was not available. In addition, there is no basis for asserting that publication of the Statement of Basis was required. The Utah Rulemaking Act requires (in pertinent part):

(8) The rule analysis shall contain:
(a) a summary of the rule or change;
(b) the purpose of the rule or reason for the change . . . .

Utah Code Ann. § 63G-3-301.

The Rulemaking Notice met both of these requirements, and also provided the name of a person to contact for more information. Any person who used that information to request a copy of the Statement of Basis received one.

Finally, EnergySolutions' attorney received a copy of the Statement of Basis on December 2, 2009, in advance of the official notice through the Utah Bulletin on January 1, 2010. *See* Attachment 6.

Comment 39.2

I. THE PROPOSED RULE IS NOT NEEDED TO PROTECT PUBLIC HEALTH AND THE ENVIRONMENT

A. Applicable Legal Standard

The Utah "no more stringent" statute in the Utah Radiation Control Act sets forth the governing legal standard, required findings, and basis for findings.

Legal Standard

- *Utah Code Ann. § 19-3-104(8)(a): "Except as provided in Subsection (9), the board may not adopt rules, for the purpose of the state assuming responsibilities from the United States Nuclear Regulatory Commission with respect to regulation of sources of ionizing radiation, that are more stringent than the corresponding federal regulations which address the same circumstances."*
- *Id. § 19-3-104(9): "The board may adopt rules more stringent than corresponding federal regulations for the purpose described in Subsection (8) only if it makes a written finding after public comment and hearing and based on evidence in the record that corresponding federal regulations are not adequate to protect public health and the environment of the state."*

Response

The Executive Secretary agrees that EnergySolutions has correctly cited the statute. He does not agree that standard applies, or, if the standard is found to apply, the Executive Secretary believes the standard has been met. *See* Parts C and D, above, and Response to Comment No. 39.6.

Comment 39.3

Required Findings. The Board may not promulgate the Proposed Rule, unless the Board makes the following two findings:

1. The on-going receipt and disposal of DU (above I metric ton) - during the period from the effective date of the Proposed Rule until approval by the Executive Secretary of the DRC of the PA - will constitute a threat to "public health and the environment of the state."

2. During the period from the effective date of the Proposed Rule until approval by the Executive Secretary of the PA, "corresponding federal regulations are not adequate to protect public health and the environment of the state." Obviously, if the Board cannot make the first finding, it cannot make the second finding.

Response

As discussed in Part C, above, the Executive Secretary does not believe the stringency provisions of the Utah Radiation Control Act apply.

Even if it is found that the Proposed Rule is more stringent that federal regulations, however, the Executive Secretary disagrees with both of EnergySolutions' interpretations. The standard for promulgating a more stringent rule under Utah Code Ann. § 19-3-104(9) is that "federal regulations are not adequate to protect public health and the environment of the state," not that disposal of waste will constitute a threat to public health and the environment of the state, as the commenter states.

Protection of public health and the environment requires that potential risks be examined before action is taken. If current law does not allow the agency to require that examination – and, again, the Executive Secretary does not believe that is the case – then that law is "not adequate to protect public health and the environment of the state."

Comment 39.4

Basis for Findings. The above findings must be based on "evidence in the record" after public notice and comment and a rulemaking hearing. Such evidence must specifically address whether "corresponding federal regulations are not adequate to protect public health and the environment of the state."

Response

The Executive Secretary agrees that, in the event a finding under the stringency provisions of the Radiation Control Act is required, this is the correct statement of the requirements for that finding.

Comment 39.5

Before addressing the evidence offered by EnergySolutions that demonstrates that no risks to public health and the environment exist from on-going DU disposal, EnergySolutions first addresses whether the Board has applied the correct legal standard. This discussion is necessary because the Statement of Basis does not apply the correct legal standard. Under the heading "Standards Governing the Board's Rulemaking Authority," the Statement of Basis merely references the general authority under Utah Code Ann. § 19-3-104(4) but ignores the requirements under Utah Code Ann. § 19-3-104(8)-(9). Statement of Basis at 5. Oddly, the Statement of Basis then states:

> *The Board intends to issue a determination, after the public comment period, about whether there are "corresponding federal regulations that are not adequate to protect public health and the environment of the state."*

Id. at 11. This would seem to indicate that at the time the Proposed Rule was issued, the Board was not sure which legal standard applies. To assist the Board, EnergySolutions respectfully requests that the Board consider the following points.

Response

The Executive Secretary does not agree that the Statement of Basis applies an incorrect legal

standard. *See* Response to Comment 39.6, and Parts C and D, above.

Comment 39.6

1. There are "corresponding federal regulations which address the same circumstances"

The NRC characterized the Proposed Rule as "equivalent" to NRC rules 10 C.F.R. Part 61 for compatibility purposes. As NRC further notes, however, the characterization in the Statement of Basis that the NRC regulations are inadequate to protect public health and the environment is "in error." Ex. A at 1.

The Talisman technical review explains in detail how 10 C.F.R. Part 61 covers disposal sites that manage DU, and how the performance objectives and other requirements found in those regulations ensure the protection of public health and the environment (including the inadvertent intruder). Ex. C at 3-5, and 7. The NRC itself summarized in a recent adjudicatory proceeding how Part 61 ensures the protection of public health and the environment:

[T]he 'bottom line for disposal' of low-level radioactive waste are the performance objectives of 10 CFR subpart C [of Part 61], which set forth the ultimate standard and radiation limits for (1) protection of the general population from releases of radioactivity; (2) protection of the individuals from inadvertent intrusion; (3) protection of individuals during operations; and (4) stability of the disposal site after closure.

In the Matter of Louisiana Energy Services (National Enrichment Services) CLI-05-05, slip opinion at 11, dated January 18, 2005. Attached as Exhibit F.

2. The Proposed Rule is More Stringent than its Federal Counterpart

The Proposed Rule is more stringent than its federal counterpart because it prohibits the disposal of significant quantities of DU unless and until the NRC completes its rulemaking. That prohibition is not reflected in the counterpart regulation in 10 C.F.R. Part 61, which allows disposal of DU as Class A LLRW. A state rule prohibiting disposal of DU at the same time that the corresponding federal rule allows such disposal is per se more stringent than the federal rule.

The Talisman technical review also identified the practical consequence of the moratorium proposed by the Board:

The period of time necessary to gain approval of the performance assessment is unknown, which means in effect that the Radiation Control Board is proposing by rule to ban the disposal of DU for an indeterminate period of time. Consequently, the rule will result in a moratorium lasting at least two years in light of the time it will take to develop a robust performance assessment and the time it will take the State to review it.

Ex. C at 8. The Statement of Basis and rulemaking record provide no support whatsoever for such a moratorium.

3. The Current Regulatory Requirements are Adequate to Ensure the Safety and Suitability of DU Disposal at the Clive Facility

Talisman provides a detailed analysis of the current NRC regulatory requirements in l0 C.F.R. Part 61 that apply to the Clive Facility to ensure the continued safe disposal of DU and other waste. See Ex. C at 3-5. Specifically, Part 61 provides that disposal sites must be sited, designed, operated, closed, and controlled so that reasonable assurance exists that exposures to humans are within the limits of the performance objectives.

The performance objectives include: (1) protection of the general population from releases of radioactivity to the general environment as set forth in 10 C.F.R. § 61.4l; (2) protection of individuals from inadvertent intrusion into the disposal site after site closure as set forth in 10 C.F.R. § 61.42; (3) protection of individuals during operations of the disposal site as set forth in 10 C.F.R. § 61.43; and (4) the site must achieve long-term stability as set forth in 10 C.F.R. § 61.44.

It is significant that the NRC regulations in Part 6l have been demonstrated to provide adequate protection of public health and the environment for many years, and continue to be relied upon. Notably, Utah has adopted these performance objectives in the Radiation Control Rules, Utah Admin. Code R313-25, and has relied upon the protections provided by Part 61 since 1982. In addition, other states with operating low-level waste disposal sites, e.g., Washington and South Carolina, have also relied on Part 6l for many years. Texas, which is currently in the process of licensing a radioactive disposal site, has also adopted Part 61.

Talisman also observed that Congress has recognized the protective value of the Part 61 performance objectives. Congress recently enacted legislation adopting the Part 61 strategy of demonstrating that radioactive waste disposal meets the performance objectives of Part 61. Specifically, in section 3116 of the National Defense

Authorization Act of 2005 (50 U.S.C. § 2601), Congress required DOE in consultation with the NRC to comply with the existing Part 61 performance objectives for disposing waste incidental to reprocessing. In addition, the DOE has adopted the current Part 61 performance objectives in its Waste Management Order 435.1 to implement its health and safety responsibilities under the Atomic Energy Act. Ex. C at 7.

4. The NRC Has Affirmed the Adequacy of its Regulations Adequate to Protect Public Health and the Environment of the State of Utah

In its comments to the Executive Secretary on the Proposed Rule, the NRC explicitly addressed this fourth issue as follows:

The Statement of Basis also concludes that NRC has recognized "the inadequacy of its current regulations." Statement of Basis at 8. Your characterization of NRC's regulations and conclusions regarding their adequacy is in error. Although the current regulations did not consider the disposal of significant quantities of depleted uranium, they are adequate to ensure the protection of the public health and safety. The requirements in 10 C.F.R. Part 61 Subpart C provide the performance objectives that all disposal facility licensees must comply with before disposing of any low-level radioactive waste. The NRC's recommendation to update a site's performance assessment prior to disposal of significant quantities of depleted uranium would ensure that the licensee continues to comply with these requirements; a recommendation to ensure compliance with the existing regulations does not indicate that the regulations are inadequate. The NRC's rulemaking effort will clarify these requirements and provide additional guidance to licensees and the Agreement States that are dealing with the disposal of unique waste streams, but engaging in a rulemaking to update the NRC's regulations does not mean that the current regulations are inadequate to protect the public health and safety while rulemaking is pursued to improve the regulations.
Ex. A at 1-2 (emphasis added).

The fact that a regulation is under review and is amended does not mean that the original regulation is no longer protective of public health and the environment. As circumstances change and more information becomes available, an administrative agency will reevaluate and modify its rules. Importantly, in this circumstance, the NRC has explicitly stated that the current regulations are adequate to protect public health and the environment while rulemaking is pursued to improve the regulations.

Talisman also addressed this point in its technical review, observing that had the NRC concluded that the current NRC requirements were not protective of health and the environment, the NRC would have taken action to prevent the disposal of DU until the rulemaking was completed. See generally Ex. C. Such action could have included issuing immediately effective orders under 10 C.F.R. § 2.202 to NRC licensees prohibiting disposal of DU until the rulemaking was completed. The NRC could also have issued orders to EnergySolutions and/or other disposal site licensees in Agreement States to prohibit disposal of DU pursuant to the provisions of 10 C.F.R. § 150.15(a)(5) and (b). The fact that the NRC has taken no formal or informal action further confirms that no immediate health and safety concern exists pending the rulemaking.

The technical review prepared by Talisman describes the limited purpose of the NRC rulemaking and why it should not be construed as an admission that 10 C.F.R. Part 61 is inadequate to protect public health and the environment:

While the rulemaking will clarify the need for a site-specific analysis, it does not indicate that the existing system is flawed or otherwise inadequately protective of public health and safety. Sections 61.12 and 61.13 already require a demonstration that the site and design of the disposal system meet the performance objectives and, therefore, the NRC rules are protective of public health and safety.
Ex. C at 5.

Response

Please *see* Parts C and D, above, which include a general discussion of the applicability of Utah Code Ann. § 19-3-104(8) and (9). *See also* the responses to comments by others that are incorporated in this comment.

The Executive Secretary does not agree with EnergySolutions' characterization of the Proposed Rule as a moratorium. *See* General Response to Comment No. 39, No. 6. The Executive

Secretary also does not agree that the federal regulations allow disposal of depleted uranium in the absence of a performance assessment that shows NRC Performance Objectives will be met.

The Statement that "it prohibits the disposal of significant quantities of DU unless and until the NRC completes its rulemaking" is in error, both because it characterizes the Proposed Rule as a prohibition and because it assumes that a licensee will not be able to have a performance assessment approved until NRC acts. The Proposed Rule allows a licensee to submit a performance assessment at any time. It does not anticipate waiting for NRC to complete rulemaking before making a determination about the adequacy of a performance assessment.

Comment 39.7

It is important to note that Section 274 (c)(4) of the Atomic Energy Act of 1974 (42 U.S.C. § 2021), and Article II, paragraph C of the Agreement between NRC and Utah give the NRC primacy in Utah regarding the disposal of "byproduct, source, or special nuclear material as the Commission from time to time determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission." Thus, the Proposed Rule and moratorium, if enacted, likely violates the preemptive effect of NRC's regulations.

Response

The Executive Secretary does not agree. Where the NRC has determined that the Proposed Rule is compatible with its program, and where the Proposed Rule is consistent with a recommendation made by the NRC, the Proposed Rule is not preempted by federal law.

Comment 39.8

The Technical Reviews demonstrate that a moratorium on DU disposal pending the NRC rulemaking is not needed to protect public health and the environment.

1. *The Location of the Clive Facility and the DU Disposal Methods are Suitable and Protective of Public Health and the Environment*

Neptune offered the following expert opinion based on its knowledge of the location of the Clive Facility and disposal methods used: "[t]he remoteness of the Clive Facility site and hostile environment for both humans and ecological systems, make it particularly well suited for disposal of large quantities of DU." Ex. D at 4. Neptune also observed that the existing NRC guidance supports the safe disposal of DU at the Clive Facility and provides a level of confidence that the full site-specific PA will confirm the same:

> *In October 2008, the Nuclear Regulatory Commission (NRC) prepared "Analysis of Depleted Uranium Disposal" as Enclosure 1 to the SECY-08-0147 [4], which concluded that near surface disposal of large quantities of depleted uranium may be appropriate at disposal depths of at least three meters. Although the NRC has acknowledged that this generic radiological performance assessment should not be relied upon as the sole basis for making site-specific licensing decisions, it does provide useful context for assessing site-suitability. In fact, the NRC relied on just such an approach for development of the classification tables in 10 CFR 61.55, which are based on a generic analysis of potential impacts at a reference site.*

Id. at 4.

[Note that this comment was moved from elsewhere in EnergySolutions' comments.] *Reliance on the work done by the NRC is in keeping with the historical practice of using generic analyses as a component of demonstrating compliance. Again, as pointed out by Neptune in their technical review, Part 61 is based in part on generic analyses that rely on a reference site. Indeed, the reference relied upon is less suitable than the Clive Facility for the disposal of LLRW.*

Response

As acknowledged in this comment, NRC's analysis in the SECY-08-0147 should not be relied on as a site-specific performance assessment. The NRC has cautioned in many places that the generic performance assessment described in this paper cannot be relied on for site-specific licensing purposes. *See, e.g., See also* SECY-08-0147, Encl. 1 at 10:[8]

> The model was designed to provide the user with flexibility to evaluate different waste forms, disposal configurations, performance periods, institutional control periods, pathways, and scenarios. The impact of these variables on projected radiological risk can be significant. Therefore, the model was developed as a first-order assessment tool to risk-inform decision making. Refinement of the model would be necessary if it was to be used for licensing decisions, and rigorous validation would be needed.

Moreover, David Esh, the lead modeler for the SECY-08-0147 has acknowledged that there are limitations in that work that would need to be carefully studied on a site-specific basis. For example, he acknowledged that neither erosion nor above-grade construction was considered.[9] He also acknowledged that the assumption made for the study that climate conditions would remain steady were too simplistic.

Finally, it should be noted that the SECY-08-0147 has also not been subject to the rigorous public notice and comment process that NRC believes is appropriate.

Comment 39.9

[Quoting Neptune]

> *Based on the 2008 NRC analysis, Neptune's preparation of PAs at other sites, and Neptune's knowledge of site conditions and disposal configurations at the Clive facility, Neptune's collective professional judgment is that a fully quantitative PA can be developed that will demonstrate compliance with applicable standards*

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[8] *See also* Workshop Presentation at 54 ("Depleted Uranium NRC Analysis: SECY-08-0147 provides basic description of assessment and assumptions; Analysis not intended to replace site-specific evaluations."), http://www.nrc.gov/about-nrc/regulatory/rulemaking/ potential-rulemaking/uw-streams/du-workshop-presentations.pdf; Workshop 2, Day 1, *supra* n.5, tr. at 107 (David Esh) ("You have to basically do the site specific analysis and determine whether it can at a particular site. I think if our conclusions were interpreted that because you have an arid site, therefore you can do it, that's not correct."); and Workshop 2, Day 1, tr. at 120 (Mr. Esh, described as "spot on" a statement by another workshop participant that "This is not a risk assessment. This doesn't tell you anything about the ability of any specific facility or site to meet or not meet performance objectives under any conditions.").

[9] *See* exchange between modeler David Esh and a workshop participant, Workshop 1, Day 1, *supra* n. 5, tr. at 93-94 (erosion not considered for SECY-08-0147); and Workshop 2, Day 1, tr. at 114, lines 16-19 (above grade disposal not considered for SECY-08-0147).

within a 10,000-year time period for disposal of some quantity of DU.

Neptune also confirmed that the future PA it is now preparing for the Clive Facility will adequately address the peak radon concentration:

> *Because peak radon activity will occur following about 1,000,000 years into the future, a more qualitative model will also be developed to evaluate ultra-long term performance. This is in keeping both with NRC guidance and our experience at other [LLRW] sites. This approach will be used rather than relying on quantitative dose projections because of the uncertainty associated with evaluating human receptor scenarios that far into the future. This uncertainty is associated both with projecting human behavior and environmental conditions. For example, several ice ages might occur, and recurrences of Lake Bonneville can be expected.*

Id. at 5.

Similarly, Enchemica's technical review describes other prior technical analyses of DU disposal at the Clive Facility that confirm Neptune's opinion set forth above:

> *EnergySolutions has carried out a site-specific analysis applicable to the disposal of large quantities of depleted uranium (DU) at their facility in Clive, Utah (Whetstone 2009). This groundwater transport evaluation was carried out in a manner consistent with previously approved site-specific assessments (Whetstone 2000, 2007), except for the modeling of additional uranium decay chains and extension of the time period to more than 10,000 years after cell closure (Whetstone 2009). Potential environmental effects of DU disposal were addressed by modeling the groundwater transport of radionuclides from the disposal cell to a compliance well at the site. The site-specific analyses included many conservative assumptions that resulted in the overestimation of leaching and transport of DU constituents from the disposal cell to a compliance well. This report reviews the characteristics of DU and summarizes the conservative assumptions and results of the site-specific modeling calculations of groundwater transport that demonstrate large-quantity DU disposal can be safely carried out at the Clive facility.*

Ex. E at 1-2.

Enchemica also provided a detailed analysis of conservative assumptions underlying the site-specific groundwater transport assessments for the Clive Facility that support past and future DU disposal. Id. at 3-4. This analysis also took into consideration the engineered cover and other cell design features and site specific information to confirm the integrity and geotechnical stability of the current disposal methods. Id. at 5. Enchemica concluded:

> *Site-specific groundwater transport modeling for waste disposal at the EnergySolutions Clive facility has demonstrated that uranium can be safely placed in the disposal cells, even when the waste is assumed to contain uranium isotopic concentrations that greatly exceed plausible concentrations, along with significant concentrations of uranium progeny (Whetstone 2000, 2007, 2009).*
>
> *The results of these site-specific performance assessments demonstrate that large quantities of DU can be safely placed in the Clive facility, because significant radionuclide transport through the groundwater will not occur. The low rainfall, lack of potable water and saline soils make the site unsuitable for present-day or future habitation. The radon barrier and the intrusion protection function of the engineered cover would provide protection to receptors exposed through a non-resident exposure scenario.*

Id. at 6-7.

Accordingly, the best available science and technical analyses demonstrate that large quantities of DU can be safely disposed at the Clive Facility. Moreover, EnergySolutions has voluntarily and probatively commenced preparation of an additional PA to demonstrate the same even before the NRC rulemaking concludes.

Response

See General Response to Comment 39, Nos. 4 and 5.

Comment 39.10

2. *The Existing Technical Analyses Satisfy Current Regulatory Requirements and Ensure the Safety and Suitability of DU disposal at the Clive Facility*

The technical review prepared by Talisman appropriately notes the emphasis in 10 C.F.R. Part 61 on technical analyses. Indeed, as it points out, the term performance assessment does not even appear in the regulations. The requirement to perform technical analyses appears in 10 CFR §§ 61.12 and 61.13:

> *Sections 61.12 and 61.13 already require a demonstration that the site and design of the disposal system meet the performance objectives and, therefore, the NRC rules are protective of public health and safety.*

The technical analyses that have been prepared by EnergySolutions and its contractors, as supplemented by the analyses prepared by the NRC in SECY-08-0147, demonstrate the suitability of the Clive Facility for the disposal of DU.

EnergySolutions has initiated preparation of a new formal PA both to satisfy the anticipated outcome of the NRC's limited rulemaking and to provide assurance that the disposal of DU at the Clive Facility historically, currently, and in the future has been done in a manner that satisfies the performance objectives of Subpart C. Nonetheless, there exist significant, robust technical analyses that, taken in the aggregate, satisfy 61.12 and 61.13. These analyses are comprised of the studies described above: the Enchemica technical review (Whetstone 2009) and the NRC analyses contained in the SECY, "Analysis of Depleted Uranium Disposal." These technical analyses demonstrate not only the absence of any near-term risk, but the high likelihood that the Clive Facility will be found suitable for the continued disposal of large quantities of DU.

3. While Highly Unlikely, in the Event the DU Disposed of at the Clive Facility is Determined to Pose a Risk to Public Health and the Environment in the Future, Mitigation Measures are Available to Eliminate Any Risks

Neptune observed in its technical review that

> *one erroneous assumption implicit in the Proposed Rule is that a moratorium is needed because once DU is disposed of at the Clive Facility, no mitigation will be possible in the event that a future PA fails to demonstrate compliance. This assumption is incorrect because performance can be successfully enhanced by various forms of mitigation.*

Ex. D at 1. Neptune found that mitigating measures that could eliminate risk - in the highly unlikely event that DU disposal posed a risk to public health and the environment - include constructing a thicker cap to reduce radon emissions or removal and relocation of the DU. Id. Thus, the Proposed Rule offers no plausible justification for the Proposed Rule.

Response

See all General Responses to Comment 39 (Nos. 1 through 9).

Comment 39.11

C. The Board Failed to Satisfy the Procedural Requirement of Receiving Evidence at a Public Hearing

Utah law requires that when adopting rules that are more stringent than corresponding federal regulations, the Board must make "a written finding after public comment and hearing and based on evidence in the record . . . ." Id. at § 19-6-104(9)(a) (emphasis added). No Utah case law exists interpreting this provision or the analogous provision limiting the rulemaking authority of the other DEQ boards. However, from the plain language it appears that commentors must be able to offer both written and oral arguments to the Board in the setting of a formal hearing. Such an approach makes sense for complex rulemakings involving "public health and environmental information and studies." Commentors should be afforded the opportunity to submit detailed technical information represented by the testimony of technical information represented by the testimony of technical experts who would be subject to further questioning from the Board.

The purpose of a public rulemaking hearing is "to afford interested persons an opportunity to submit written data, views, and arguments regarding why the proposed regulation should or should not be adopted." Utah Restaurant Assoc. v. Salt Lake City-County Board of Health, 771 P.2d 671, 674 (Utah Ct. App. 1989) (citation omitted). Thus, commentors for rulemaking under Utah Code Ann. § 19-6-104(9)(a) must be able to present written comments and comments at a public hearing.

The Board held what it referred to as a "public hearing" on January 26, 2010. This event is more properly referred to as a public meeting, given that the Board provided no opportunity for commentors to explain their

comments, submit expert testimony to support their comments, or to entertain questions from the Board. Indeed, the hearing was not even open to commentors who intended to present written comments, as explained by the Executive Secretary during the January Board meeting:

Peter, I need to clarify something for the Board. The January 26 meeting, it's an opportunity for the public to provide [tape cuts out] orally rather than in writing. It is not a meeting where there's going to be dialogue expect to acknowlec recorded by a court reporter and the transcript will be made available and those comments are treated the same as comments that have been received in writing. So let's make this clear, this isn't going to be a period for debating the merits of what's being discussed. It's an opportunity for oral comments for those people who don't take the time to write them to us. Write and send them to us.

Transcript of January 12, 2010 Radiation Control Board meeting, attached as Exhibit G. Accordingly, the Proposed Rule violated the procedural requirement to hold a meaningful public hearing. The value of the public meeting was further diminished because the majority of the Board was not even present at the meeting to hear comments - only two members attended.

The reference to "record" "evidence" also suggests that the Legislature intended that the public hearing be through a more formal process which could include sworn testimony and cross examination as occurs with some federal agencies which undertake rulemaking through formal adjudication. This point is less clear from the language of the statute.

Although Utah Code Ann. § 19-3-104(9) requires additional findings, there is nothing in the provision to suggest that a different procedure is required. The terms "hearing," "evidence" and "record" are all used in the Utah Rulemaking Act, and have not been interpreted to require the kinds of extraordinary procedures proposed by EnergySolutions.

The rulemaking hearing was open to any person, whether or not they submitted written comments. The comments of the Executive Secretary simply reflected the likelihood that the opportunity was more likely to be used by those who were not planning to file written comments. Several of those commenting at the meeting did also submit written comments. Written comments and oral comments carry the same weight.

It is common practice for rulemaking hearings to be conducted by hearing officers who are not the same person(s) as the final decisionmaker. We acknowledge the commenter's preference, but no authority is cited for the suggested requirement that the final decisionmaker attend the hearing.

Comment 39.12

D. The Board Failed to Consider the Impact of the Proposed Rule on Small Businesses.

Nowhere in the Statement of Basis is there any analysis of the impact of the Proposed Rule on small businesses. The Utah Administrative Rulemaking Act requires that the rulemaking agency consider the fiscal impacts of a proposed rule on business and, if there is an expected negative fiscal impact on small business, the agency is required to take certain steps to mitigate that impact. Utah Code Ann. § 63G-3-301(5) and (6).

Cavanagh Services Group ("Cavanagh") is a Utah woman-owned small business in Utah that has contracts with EnergySolutions for the loading and transloading of DU for rail shipment to the Clive Facility. The Statement of Basis does not even identify Cavanagh, much less assess the impacts of the Proposed Rule to Cavanagh's business. This omission means that the Statement of Basis is legally defective. Accordingly, the Statement of Basis and the Proposed Rule should be withdrawn and the proper analysis performed under Utah Code Ann. § 63G-3-301(6).

Response

See Part E, above.

Comment 39.13

Conclusion

As shown above, the Proposed Rule is fatally flawed because (1) the Board has failed to recognize and acknowledge that there are existing federal regulatory requirements that ensure the safe disposal of the Clive Facility, (2) the Board has violated the "no more stringent" statute of the Utah Radiation Control Act, (3) the location of the Clive Facility and the DU disposal methods used there are suitable and protective of public health and the environment, (4) even in the highly unlikely event that DU disposal at the Clive Facility is shown to pose a risk to public health and the environment, mitigation measures are available to eliminate such risks, and (5) the Proposed Rule violates applicable law, exceeds the Board's authority, and contravenes sound public policy. In sum, the Proposed Rule is not needed to protect public health and the environment of the State of Utah. Accordingly, EnergySolutions respectfully requests that the Board vacate the Proposed Rule.

Response

This statement summarizes comments made more fully elsewhere in EnergySolutions' comments. Please *see* those comments for responses.

Comment 39.14 (Talisman)

Regulatory Background. Regulations promulgated by the U.S. Nuclear Regulatory Commission (NRC) specifically address the disposal of depleted uranium. The applicable federal regulation, found at 10 C.F.R. Part 61, Licensing Requirements for Land Disposal of Radioactive Waste, promulgated by the NRC establish the requirements for land disposal of radioactive waste and the procedures, criteria, and terms and conditions for licenses for the disposal of LLRW containing byproduct, source, and special nuclear material. 10 C.F.R. § 61.3. Depleted uranium (DU), which is the subject of this rulemaking, is source material and is regulated under Part 61. As explained in NRC's comments, no room for disagreement exists that DU is regulated. In fact DU was specifically considered in the development of Part 61. As recently affirmed by the NRC, DU is Class A waste subject to 10 CFR Part 61.

Response

The Executive Secretary agrees with the statement regarding applicable law and the statement that DU is regulated under Part 61, and that DU is a Class A waste. *See* General Response to Comment 39, No. 1. The Executive Secretary also agrees that DU was considered in the development of Part 61, specifically the proposed waste classification provisions. The final waste classification regulation, however, is not based on NRC's analysis of the disposal of significant quantities of depleted uranium.

Although NRC recently affirmed that the classification for depleted uranium will not change, it did acknowledge that, because significant quantities of depleted uranium were not analyzed in the development of Part 61, it was not appropriate to rely on that waste classification without an adequate performance assessment. *See* Statement of Basis and documents cited therein.

Comment 39.15

Performance Objectives. Part 61,which the State of Utah has adopted in its Utah Administrative Code at R313-25, is protective of the public health and the environment of Utah. A key part of Part 61 are the four performance objectives in Subpart C of Part 61 that when met ensure the safe disposal of LLRW. Applicants for disposal site licenses and license renewals must demonstrate by technical analyses that these performance objectives have been met. These analyses, which include performance assessments, are reviewed by the licensing authority as part of the licensing process.

Part 61 provides in section 61.40 that disposal sites must be sited, designed, operated, closed, and controlled so that reasonable assurance exists that exposures to humans are within the limits of the performance objectives. The performance objectives are:

1. *Protection of the general population from releases of radioactivity to the general environment as set forth in 10 C.F.R. § 61.41.*
2. *Protection of individuals from inadvertent intrusion into the disposal site after site closure as set forth in 10 C.F.R. § 61.42.*
3. *Protection of individuals during operations of the disposal site as set forth in 10 C.F.R. § 61.43.*
4. *The site must achieve long-term stability as set forth in 10 C.F.R. § 61.44.*

Response

The Executive Secretary agrees with this characterization of some of the requirements of Part 61.

Comment 39.16

Adequacy of Part 61. The existing Part 61 is adequate because the regulations require that performance objectives of Subpart C be met and these performance objectives are protective for both the public and a site intruder. The State of Utah has adopted these performance objectives in Utah Administrative Code. The NRC regulations as codified in Part 61 have been demonstrated to provide adequate protection of public health and safety for disposing of LLRW for many years. NRC and the various states have relied upon the protections provided by Part 61 since 1982. Not only has Utah adopted Part 61, the other states with operating LLRW disposal sites, Washington and South Carolina, also have done so. Texas, which is currently in the process of licensing a radioactive disposal site, also has adopted Part 61. All states that license LLRW disposal sites have adopted Part 61.

The NRC summarized the significance of the performance objectives during a recent adjudicatory proceeding as follows:

> *the 'bottom line for disposal' of low-level radioactive waste are the performance objectives of 10 CFR subpart C [of Part 61], which set forth the ultimate standard and radiation limits for (1) protection of the general population from releases of radioactivity; (2) protection of the individuals from inadvertent intrusion; (3) protection of individuals during operations; and (a) stability of the disposal site after closure.*

Further evidence that the performance objectives of Part 61, Subpart C, are adequate is demonstrated by the fact that the Proposed Rule references and relies on them.

Response

The Executive Secretary agrees that, if met, NRC Performance Objectives are protective of public health and safety. *See* General Response to Comment 39, Nos. 1 and 2.

Comment 39.17

Specific Technical Requirements. In addition to meeting the above performance objectives, Part 61 has numerous specific technical requirements addressing waste disposal that also must be met, e.g., 61.50, 61.51, 61.52, 61.53, 61.55, 61.56, and 61.57. These technical requirements address siting suitability, disposal design, operational and closure provisions, environmental monitoring, and waste classification and characteristics. These provisions provide for a comprehensive regulatory envelope that together with the performance objectives provides protection to the public health and safety. An important element of these technical requirements is the classification of the radioactive waste. There are three classes: A, B, and C. As noted above, DU is Class A waste. The classification process is described in 10 C.F.R. § 61.55. Depending on the class of waste different requirements of Part 61 apply.

In sum, 10 C.F.R. Part 61 is a comprehensive federal regulation that governs the disposal of LLRW including DU. Utah, as an Agreement State, must adopt requirements that the NRC finds to be adequate for protection of the public health and safety and to be compatible with the NRC requirements as provided for under section 274 (d) and (j) of the Atomic Energy Act of 1974 (42 U.S.C. § 2021), which Utah has done by its establishment of Utah Administrative Code at R313-25. While performance assessments, which are the subject of the Proposed Rule, are important tools to predict sufficient protection of public health and the environment, the governing regulations including implementation of the performance objectives and specific technical requirements together impose rigorous controls, giving the Board, workers, and public stakeholders confidence that Clive's operations remain safe.

Response

The Executive Secretary agrees that, if met, NRC Performance Objectives are protective of public health and safety. He does not agree that the other provisions cited are sufficient in the absence of a performance assessment, particularly with respect to the disposal of significant quantities of depleted uranium. *See* Statement of Basis and documents cited therein, and General Response to Comment 39, No. 2.

Comment 39.18

PURPOSE AND SCOPE OF NRC RULEMAKING

Clarification of Part 61 Implementation. Part 61 does not use the term "performance assessment." Rather it requires "technical analyses," which include analyses other than performance assessments. Existing NRC guidance in NUREG-1573 provides that performance assessments are needed to demonstrate that the public is protected from radioactive releases post closure to meet the standards of the performance objective in 10 C.F.R. § 61.41. As noted above, Part 61 requires in sections 61.12 and 61.13 that technical analyses demonstrate that these objectives be met. As a result, to ensure that the technical analyses contain performance assessments, the NRC intends to codify a requirement for conducting a site specific performance assessment. It is doing this by embarking on a limited rulemaking effort to clarify Part 61 implementation for DU. While providing specifically for performance assessments will clarify the need for a site-specific analysis, it does not indicate that the existing system is flawed. 10 C.F.R. § 61.12 and 13 already require the demonstration that the site and design meet the performance objectives and, therefore, are protective of the public health and safety.

Response

See Response to Comment 39.17.

Comment 39.19

In fact, the NRC recently informed Utah that NRC does not consider its regulations to be flawed. As to Utah characterization of the adequacy of the NRC regulations in Part 61 in Utah's Statement of Basis for Administrative Rulemaking, dated December 1, 2009, NRC said:

> *Your characterization of NRC's regulations and conclusions regarding their adequacy is in error. Although the current regulations did not consider the disposal of significant quantities of depleted uranium, they are adequate to ensure the protection of the public health and safety. The requirements in 10 CFR Part 61 Subpart C provide the performance objectives that all disposal facility licensees must comply with before disposing of any low level radioactive waste. The NRC's recommendation to update a site's performance assessment prior to disposal of significant quantities of depleted uranium would ensure that the licensee continues to comply with these requirements; a recommendation to ensure compliance with the existing regulations does not indicate that the regulations are inadequate. The NRC's rulemaking effort will clarify these requirements and provide additional guidance to licensees and the Agreement States that are dealing with the disposal of unique waste streams, but engaging in a rulemaking to update the NRC's regulations does not mean that the current regulations are inadequate to protect the public health and safety while rulemaking is pursued to improve the regulations.*

(Emphasis added). Thus, it is clear that the State cannot rely on the actions of the NRC to base its conclusions that the NRC rule is inadequate. NRC has made it clear that the fact that it is clarifying its rule does not mean the existing rule is inadequate to protect the public health and safety.

Response

See Response to Comment No. 39.6.

Comment 39.20

NRC Did Not Choose to Impose a DU Disposal Moratorium. The fact that the NRC chose to clarify Part 61 implementation does not in any way suggest that the NRC has concluded that there is an immediate health and safety issue regarding the disposal of depleted uranium. As evidenced by NRC's comments on the Proposed Rules noted above at footnote 6, there is not a current safety issue with the NRC requirements. Nowhere has NRC said that Part 61 is inadequate to protect the public health and safety. If that were the case, NRC would have taken immediate action to prevent the disposal of DU until the rulemaking was completed. Such action could have included issuing immediately effective orders under 10 C.F.R. § 2.202 to NRC licensees prohibiting disposal of DU until the rulemaking was completed. The NRC could also have issued orders to EnergySolutions and other disposal site licensees in Agreement States to prohibit disposal of DU pursuant to the provisions of 10 CFR 150.15 (a)(5) and (b). This would be consistent with section 274 (c)(4) of the Atomic Energy Act of 1974 (42 U.S.C. § 2021), and with Article II, paragraphs C of the Agreement between NRC and Utah that provides that the NRC authority in Utah continues as to the disposal of:

> *. . . byproduct, source, or special nuclear material as the Commission from time to time determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission.*

Quite to the contrary, the NRC has taken no formal or informal action suggesting an immediate health and safety concern.

Moreover, NRC has not used its informal actions such as Information Notices, Bulletins, or Regulatory Issuance Summaries to provide regulatory directives to discourage DU disposal pending the NRC rulemaking. Rather, it has made clear that no immediate action is necessary. In public meetings in Salt Lake City, Utah, Staff specifically addressed this point by noting that they considered and rejected the need to take some near-term action specifically because there is no near-term threat to health and safety. David Esh stated at the September 22, 2009 meeting of the Utah Radiation Control Board that "there isn't an immediate public health and safety concern surrounding this material."

Response

See General Response to Comment 39, No. 3, regarding the statements from NRC recommending that a performance assessment be conducted prior to disposal of significant quantities of depleted uranium.

It is several Agreement states, not NRC, that regulate the facilities for which a performance assessment review is suggested. NRC relied on them to take appropriate action, as it demonstrated in the following statement:

> In addition, as we stated earlier in this proceeding, an NRC environmental impacts analysis of depleted uranium disposal impacts does not require a full-scale site-specific review, an inquiry in the purview of the responsible licensing agency. The NRC does not regulate any of the five near-surface waste disposal facilities identified in the FEIS as potential locations for disposal of the depleted uranium. These potential disposal sites are either regulated by state authorities under the NRC's Agreement State program, or by the Department of Energy. If LES ultimately chooses one of these waste disposal facilities, it will fall within the purview of one of these authorities - not the NRC - to approve and regulate the disposal. We would expect the appropriate regulatory authority to conduct any site-specific evaluations necessary to confirm that radiological dose limits and standards can be met at the disposal facility, in light of the quantities of depleted uranium envisioned. In short, our NEPA analysis today considers estimated disposal impacts, but does not purport to assess whether all regulatory requirements would be satisfied at any particular site.

Louisiana Energy Services, L.P. (National Enrichment Facility), CLI-06-15, 63 NRC 687, 690-91 (2006) (*internal quotations and footnotes omitted*).

With respect to the quote by David Esh, it is helpful to put the quote in context:

> Although I believe they could change the waste classification, they felt regarding this situation that it is important they follow this deliberative process with their stakeholders, get all the input and let the process precede as it may. And this is partly because there isn't an immediate public health and safety problem surrounding this material. It's unlikely that large quantities of Depleted Uranium can be disposed of as Class A waste without additional requirements. It would be a challenge if you took hundreds of thousands of metric tons and put it in ground and put a meter of soil on top of it that you could meet the performance objectives. That would be a very big challenge, technically.

It is apparent that in making that statement, Mr. Esh was relying on the fact that the facility will be required to demonstrate through a performance assessment that it will meet NRC Performance Objectives before disposing of waste, as the Proposed Rule requires.

Comment 39.21

Prudential Site-Specific Evaluation. Rather than prohibit disposal of DU until the rulemaking is completed or direct that performance assessments be re-reviewed, NRC stated in a "communication document," which is not a regulatory document (either formal or informal), that it would be "prudent" for the site operator and state regulator to review the existing site-specific performance assessment documentation and existing control measures. Utah DRC and EnergySolutions have agreed to amend the license resulting in the implementation of revised License Condition 35. This condition includes burial of DU with a minimum of 10 feet below the top of the cover. It also requires submittal of a performance assessment, in general conformance with the approach used by the NRC in SECY-08-0147 be submitted for review and approval no later than December 31, 2010.

Response

See General Responses to Comment 39 (Nos. 1 through 9).

Comment 39.22

Suggesting that it would be prudent to review existing performance assessments is well within the purview of the regulator under the existing Part 61. NRC further stated that the performance assessment should minimally be reviewed against the initial parameters staff identified in SECY-08-0147. In that regard, it is noted that in SECY-08-0147 the NRC staff concluded after performing a generic performance assessment that for arid sites disposal of large quantities of DU may be appropriate. It recommended burial depths at a minimum of 3 meters which is consistent with the current license conditions for the Clive site, an arid site. As noted above, License Condition 35 already satisfies this requirement. However, as also noted above, nowhere, including in their memorandum to the Commission, has Staff suggested that Part 61 in its current form, is not adequate to protect health and safety.

Response

See Response to Comment No. 39.8 and General Response to Comment 39, Nos. 1, 2 and 9.

Comment 39.23

Congress Has Recognized the Protective Value of Part 61. Congress also has recognized the protective value of the Part 61 performance objectives. Recently, Congress enacted legislation that adopted the Part 61 strategy of demonstrating that radioactive waste meets the performance objectives of Part 61. Specifically in section 3116 of the National Defense Authorization Act of 2005 (50 U.S.C. § 2601), Congress required the U.S. Department of Energy (DOE) in consultation with the NRC to comply with the existing Part 61 performance objectives for disposing waste incidental to reprocessing. In addition, DOE has adopted the current Part 61 performance objectives in its waste management Order 435.1 to implement its health and safety responsibilities under the Atomic Energy Act.

In sum, the performance objectives of Part 61 which underlie the Part 61 disposal requirements are the accepted standard in the United States for the protection of the public health and safety in disposing of LLRW. This same regulatory framework has been adopted by all states with operating or planned LLRW disposal sites and the DOE, which operates LLRW disposal facilities at 10 sites. They are adequate to protect the public. There exists no evidence to the contrary and no basis to conclude otherwise.

Response

See General Response to Comment 39, Nos. 1 and 2. Also *see* generally the Statement of Basis

and Part A, above.

Comment 39.24

III. THE PROPOSED ACTION CONTRAVENES NRC PUBLIC POLICY

The NRC has found that the existing disposal regulations in Utah Administrative Code at R13-25 are compatible with the NRC regulations and are adequate to protect the public health and safety. These regulations are consistent with Part 61 and allow for the disposal of LLRW, which would include DU and other Class A waste, if the performance objectives and other applicable requirements are met. The proposed regulation, if enacted, will deny the disposal of LLRW and create a de facto moratorium for the disposal of DU which is inconsistent with federal regulations. This is because the proposed regulation singles out DU from other Class A waste and requires a performance assessment to be submitted and approved before significant quantities of DU are disposed of. The period of time necessary to gain approval of the performance assessment is unknown, which means in effect that the Radiation Control Board is proposing by rule to ban the disposal of DU for an indeterminate period of time. Consequently, the rule will result in a moratorium lasting at least two years in light of the time it will take to develop a robust performance assessment and the time it will take the State to review it.

As explained above, there is no basis for concluding that there is a current or immediate health and safety issue if additional DU is added to the site and that there is clearly sufficient time to take action should later reviews determine such actions are warranted. Furthermore, the NRC has reached the same conclusion regarding the absence of a near-term threat.

Response

The Executive Secretary disagrees with the commenter's characterization that the Proposed Rule is a de facto moratorium, inconsistent with federal regulations and in contravention of NRC public policy. As acknowledged in the comment, NRC regulations allow the disposal of LLRW "if the performance objective and other applicable requirements are met." The Proposed Rule would require the licensee to conduct a performance assessment to show its site meets the performance objectives. *See also* Response to Comment No. 39.6 and General Response to Comment 39, No 6.

Comment 39.25

FN 9: The Proposed Rule provides that the performance assessment must be updated to reflect NRC guidance once such guidance is prepared and any requirements that results from NRC rulemakings. It is unclear from the proposed rule language whether the revised performance assessment must be resubmitted if a performance assessment has already been approved and if so, whether additional DU maybe disposed of pending the review of the revised performance assessment.

Response

The additional analysis that will be required, if any, will only become clear after NRC completes its rulemaking and guidance. The risk that a licensee will have to do additional analyses is a necessary consequence of the licensee's decision to dispose of depleted uranium in advance of the completion of NRC's process.

Comment 39.26 (Neptune)

I. SUITABILITY OF THE CLIVE FACILITY FOR DISPOSAL OF DU

In October 2008, the Nuclear Regulatory Commission ("NRC") prepared "Analysis of Depleted Uranium Disposal" as Enclosure 1 to the SECY-08-0147 [4], which concluded that near surface disposal of large quantities of depleted uranium (DU) may be appropriate at disposal depths of at least three meters. Although the NRC has acknowledged that this generic radiological performance assessment (PA) should not be relied upon as the sole basis for making site-specific licensing decisions, it does provide useful context for assessing site-suitability. In fact, the NRC relied on just such an approach for development of the classification tables in 10 CFR 61.55, which are based on a generic analysis of potential impacts at a reference site. Based on the 2008 NRC analysis, Neptune's preparation of PAs at other sites, and Neptune's knowledge of site conditions and disposal configurations at the Clive Facility, Neptune's collective professional judgment is that a fully quantitative PA can be developed that will demonstrate compliance with applicable standards within a 10,000-year time period for disposal of some quantity of DU. Consistent with NRC guidance, such a PA would project current conditions and current knowledge about society for the next 10,000 years. The remoteness of the Clive Facility and hostile environment for both humans, for whom there is little evidence of habitation of the area, and ecological receptors, tend to make it well suited for disposal of DU.

Response

See Response to Comment No. 39.8 and General Response to Comment 39, No 5.

Comment 39.27

To evaluate the performance of the Clive Facility with respect to DU disposal, Neptune has been engaged by EnergySolutions to prepare a model using the latest analytical tools (GoldSim [5]) and PA methodologies (probabilistic systems-level modeling). GoldSim was first used to support performance assessment at Yucca Mountain in the 1990s, and GoldSim modeling has continued at Yucca Mountain through this decade. Indeed, GoldSim was initially developed specifically for the Yucca Mountain Project. Neptune started using GoldSim to model the Los Alamos National Laboratory ("LANL") low-level radioactive waste ("LLRW") disposal facility in1999. This was followed by Neptune's implementation of GoldSim models in support of PAs for DOE's LLW disposal facilities at the Nevada Test Site ("NTS") and the Savannah River Site (SRS).

GoldSim is well-suited for dynamic system-level models that fully couple transport processes, and manage uncertainty through probabilistic specification of models, and subsequent Monte Carlo simulation. Neptune has also developed a generic PA model in GoldSim that is available for public use, which has been downloaded by NRC and other organizations. Neptune will develop a quantitative PA for the Clive Facility using GoldSim, modeling source term, source release, engineered barriers, transport through environmental media, and dose to potential human receptors. The model approach will be based on regulatory guidance (including a DOE white paper on probabilistic modeling), and on standard practices for performing risk/dose assessments. A fully quantitative model will be prepared to model the next 10,000 years.

There are some notable similarities between the Clive Facility and the NTS facilities, one of the sites analyzed by Neptune using GoldSim. The PA models that Neptune has developed for the NTS modeled a hostile desert environment. For example, both areas are hostile environments for humans and ecological receptors, groundwater is unlikely to serve as a drinking water source (for different reasons), and transport of radionuclides is affected by the low rates of precipitation, the high evaporation potential, and the presence of arid lands biota. The NTS PAs developed by Neptune demonstrated compliance for disposal of large quantities of low-level radioactive waste in shallow land burial, some of which produced large amounts of radon. Consequently, it seems reasonable that a quantitative PA for the Clive Facility might demonstrate compliance with performance objectives for disposal of DU.

Response

See General Response to Comment 39, No 5.

Comment 39.28

Because peak radon activity will occur following about 1,000,000 years into the future, a more qualitative model will also be developed to evaluate ultra-long term performance. This is in keeping both with NRC guidance and our experience at other LLW sites. This approach will be used rather than relying on quantitative dose projections because of the uncertainty associated with evaluating human receptor scenarios that far into the future. This uncertainty is associated both with projecting human behavior and environmental conditions. For example, several ice ages might occur, and recurrences of Lake Bonneville can be expected.

The status of human civilization that far into the future, particularly after geologic events, also is uncertain. For example, modem man has not been in the position of surviving a glacial epoch. Nonetheless, it is possible to assess concentrations or activity of radon, uranium and other radionuclides in various media for different possible futures of ice age and Lake Bonneville recurrences, to which any human receptors at that time could be exposed.

Although conditions far into the future are uncertain, it is no more reasonable to assume only negative outcomes than it is to assume positive outcomes. One could imagine scenarios under which ice age and Lake Bonneville effects might be beneficial for the disposal facility (e.g., sediment deposition), as well as scenarios under which the performance of the Clive Facility is adversely affected (e.g., wave action). This will be explored further in the ongoing PA effort based on data and information from available geology, climatic, and hydrology studies of the local Basin and Range province and Lake Bonneville in particular.

An important aspect of this ultra-long term analysis will be to identify and model a set of scenarios that are representative of potential future conditions. This is done by conducting a thorough examination of features, events and processes that are relevant to site performance. For this analysis for the Clive Facility, this might include isostatic rebound effects when a future Lake Bonneville recedes, and different ecological biomes that might occur as conditions change.

Response

See General Response to Comment 39, No 5.

Comment 39.29

II. POTENTIAL MITIGATIVE STRATEGIES

One erroneous assumption implicit in the Proposed Rule is that a moratorium is needed because once DU is disposed of at the Clive Facility, no mitigation will be possible in the event that a future PA fails to demonstrate compliance. This assumption is incorrect because performance might be enhanced by various forms of mitigation. For example, the ongoing PA effort will include a model of the planned engineered cap. However, if the PA for these cap conditions does not demonstrate compliance, mitigation measures can be identified that would show how compliance might be achieved. These could involve using a thicker native clay soil layer to reduce radon emissions, or could involve a thicker layer of riprap to reduce the effects of wave action if the lake rises.

Once the PA model for current conditions is completed and transport and exposure pathways have been identified, the results can be used to inform which additional mitigating measures would be most effective. For example, the PA model could be used to optimize the thickness of various engineered cap layers to mitigate release of radon from the disposal system, or the thickness of the riprap layer to sufficiently reduce the effect of wave action on the Clive Facility. Other possibilities are to increase the depth at which the DU is disposed or reduce the overall amount of DU disposed. Site-specific analyses are very useful not only for understanding site performance, but enhancing site performance.

Response

See General Response to Comment 39, No 7.

Comment 39.30 (Enchemica)

EnergySolutions has carried out a site-specific analysis applicable to the disposal of large quantities of depleted uranium (DU) at their facility in Clive, Utah (Whetstone 2009), attached as Exhibit 1. This groundwater transport evaluation was carried out in a manner consistent with previously approved site-specific assessments (Whetstone 2000, 2007); except for the modeling of additional uranium decay chains and extension of the time period to more than 10,000 years after cell closure (Whetstone 2009). Potential environmental effects of DU disposal were addressed by modeling the groundwater transport of radionuclides from the disposal cell to a compliance well at the site. The site-specific analyses included many conservative assumptions that resulted in the overestimation of leaching and transport of DU constituents from the disposal cell to a compliance well. This report reviews the characteristics of DU and summarizes the conservative assumptions and results of the site-specific modeling calculations of groundwater transport that demonstrate large-quantity DU disposal can be safely carried out at the Clive facility.

2.0 Radiological and Chemical Properties of Depleted Uranium

Uranium can exist in natural, enriched, or depleted form. Natural uranium is ubiquitous in the environment and consists of a mixture of isotopes (Table l). Natural uranium, like most naturally occurring elements, can be present in soils at a range of concentrations. Typical soil uranium concentrations are a few parts per million (ATSDR 1999). Low-grade uranium ore deposits generally have uranium concentrations from about 0.03 to 0.25% (Finch 2003). Uranium also occurs in higher-graded deposits, such as the McArthur River and Cigar Lake deposits in Canada, which have average grades of 17% and 2l%o U3O8, respectively (Cameco 2009).

Enriched uranium is produced by separation of uranium isotopes to enhance the concentrations of uranium-234 and uranium-235. Depleted uranium is a byproduct of the enrichment process and contains lower proportions of uranium-234 and uranium-235 and a slightly higher percentage of uranium-238 than natural uranium (Table l). Because the concentrations of higher-activity isotopes have been reduced, the specific activity of DU is only about 60% of the specific activity of natural uranium (Table 2). Consequently, the radiological hazard of DU at the time of disposal is less than that of natural uranium. The radiological hazards of both natural uranium and DU are considered to be low because of their low specific activities (ATSDR 1999).

The radioactivity of natural uranium at secular equilibrium (i.e., all progeny are in equilibrium) will remain constant for an extremely long time, although the uranium will eventually decay to stable lead isotopes. DU will become slightly more radioactive with time because of the production of radioactive progeny by decay. During the first year after DU separation, the activities of immediate progeny (thorium-234, protactinium-234m and thorium-231) reach equilibrium. Following this initial in-growth, the activity of DU remains approximately constant for over 1,000 years until in-growth of protactinium-23l becomes significant (WHO 2001). Peak activity of DU would be expected about 1,000,000 years after separation (NRC 2008) but would not exceed the activity of natural uranium.

Because the chemical hazard of uranium does not depend on its isotopic composition, DU has the same chemical toxicity as natural uranium (WHO 2001). The environmental behavior of DU and natural uranium, including solid phase solubility and adsorption, are also the same.

Because the progeny produced by radioactive decay are different elements, their environmental mobilities are not the same as uranium and were addressed by the site-specific transport modeling.

3.0 Site-Specific Analyses of Depleted Uranium Disposal at the Clive Facility

The site-specific groundwater transport assessments for the Clive facility (Whetstone 2000, 2007, 2009) included a number of conservative assumptions, resulting in overestimations of the transport of uranium isotopes and their progeny. Key elements of these assessments that incorporated conservative assumptions include: 1) source term concentrations and constituent release, 2) disposal cell design and infiltration modeling, 3) vertical and horizontal transport modeling, and 4) the site standards/groundwater protection levels ("GWPLs") used in the evaluations.

3.1 Source Term and Constituent Release

The source term concentrations of uranium isotopes in the groundwater transport assessments carried out for the EnergySolutions Clive facility included a number of conservative assumptions (Whetstone 2000, 2007, 2009). The activities of uranium-232, uranium-234, uranium-236 and uranium-238 were assumed equal to the specific activities of each isotope. This assumption is equivalent to assuming that the concentration of each isotope is equal to the concentration present when the entire source term is composed solely of that isotope as metallic uranium. Because the waste form cannot be completely composed of all four of these isotopes at the same time, use of these activities in the site-specific assessments is extremely conservative. The assumed activities are also conservative because disposed DU will be a uranium oxide (U3O8 or UO2) rather than metallic uranium, which would result in even lower uranium activity (Table 2).

Uranium-233 and uranium that is enriched in uranium-235 are special nuclear materials (SNM). EnergySolutions was granted an exemption allowing their possession of waste containing SNM (NRC 1999); this exemption states that concentrations in individual waste containers at the EnergySolutions site must not exceed 75,000 pCi/g for uranium-233 or 1,900 pCi/g for uranium-235. Accordingly, the groundwater transport assessments used source-term concentrations of uranium-233 and uranium-235 equal to these maximum SNM concentrations.

Uranium-232,urantum-233 and uranium-236 arc not naturally occurring isotopes and are not present in DU, so the source-term activities of these isotopes used in the groundwater transport assessments are extremely conservative. The total activities of the combined uranium isotopes used in the site-specific groundwater transport assessment exceed the expected total activities in DU by many orders of magnitude (Table 2). Sixteen isotopes were modeled in the site-specific assessment based on six decay chains for uranium (Whetstone 2009). The isotopes modeled included six uranium isotopes (Table 1), nine isotopes important in the decay chains (americium-234, curium-244, plutonium-238, plutonium-239, plutonium-240, plutonium-242, radium-226, thorium-230 and thorium-232) and potassium-40 to provide a comparison to previous modeling results. The source term concentrations for thorium-230 and potassium-40 were set equal to their specific activities, which far exceeds their likely concentrations as the DU or any other waste accepted at the site will never consist solely of these materials. The source term concentrations for the remaining decay-chain isotopes were set equal to the maximum concentrations allowed for Class A waste (40 CFR 61.55, Table 1).

Because waste typically has radionuclide concentrations well below the Class A limits, the assumed concentrations are conservatively overestimated. The waste container life was conservatively assumed equal to zero in the site-specific groundwater transport analyses. It was also assumed that release rates from the waste form remained constant until the source concentration was totally mobilized. This is a conservative assumption because release rates would be expected to decline as the source concentrations decreased. The release rates were calculated from sorption coefficients (Kds) for the radionuclides that were conservatively selected to be the lowest values available in the literature, except for radionuclides with site-specific values (Whetstone 2000). Thus, the source term and constituent release calculations used either site-specific information or conservative, bounding values where site-specific information was not available to provide conservatively high estimates of constituent release rates.

3.2 Cell Design and Infiltration Modeling

The engineered cover on the Class A disposal cells at the EnergySolutions Clive facility is a multi-layer system. From bottom to top, the components of the cover include a two-component compacted clay radon barrier (2 ft), lower granular filter zone (0.5 ft), sacrificial soil layer (1 ft), upper granular filter zone (0.5 ft), and erosion (rock rip rap) barrier layer (1.5 ft). The minimum thickness of the engineered cover is 1.7 meters (5.5 ft). The site-specific evaluations of groundwater transport (Whetstone 2000, 2007, 2009) included the effects of the cover on infiltration. The Class A disposal cells are lined with a 2-foot-thick layer of compacted clayey native soil, which was also included in the site-specific analyses (Whetstone 2000, 2007, 2009).

The calculations performed for the Clive facility used infiltration rates modeled from site-specific weather data, including evapotranspiration, temperature, precipitation and solar radiation data, as well as landfill soil and design data (Whetstone 2000 ,2007, 2009). The site-specific modeling was based on a very conservative approach that ultimately overestimated the amount of infiltration that would enter the disposal cells. EnergySolutions' Clive facility is located in an area with evaporation rates several times higher than precipitation rates. Based on the site characteristics, it is highly unlikely that incident precipitation will infiltrate through the cover and enter the disposal cell.

3.3 Vertical and Horizontal Groundwater Transport Calculations

The vertical and horizontal groundwater transport calculations used the conservative calculated site-specific infiltration data, and site-specific or conservative Kd, hydraulic conductivity, hydraulic gradient, and effective porosity data (Whetstone 2000, 2000, 2009). These calculations incorporated the effects of the many Clive facility features that limit release of uranium isotopes and other radionuclides to the groundwater and transport to the compliance well, including extremely low infiltration and groundwater flow rates and the presence of soil constituents that will remove uranium and other radionuclides from leachate and groundwater by sorption.

The site-specific groundwater transport calculations were carried out for time periods of up to 12,000 years (Whetstone 2009). Results from these transport calculations were used to evaluate concentrations at the groundwater table underneath the disposal cell and at the compliance well. Results of the transport modeling calculations showed that none of these modeled radionuclides would exceed the GWPLs at the compliance well within the 10,000-year period of performance, even though many extremely conservative assumptions were used in the evaluations (Whetstone 2000, 2007, 2009).

3.4 Performance Standards

The performance standards for protection of the general public from releases of radioactivity to the general environment (groundwater, surface water, air, soil, plants or animal) or to an inadvertent intruder are specified in 10 CFR 61.41 and l0 CFR 61 .42. The concentrations released must not result in an annual dose to any member of the general public greater than 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ. The GWPLs used in the EnergySolutions site-specific modeling calculations (Whetstone 2000, 2007, 2009), are included in the site groundwater quality discharge permit (No. UGW450005). These GWPLs are based on a dose limit of 4 mrem from consumption of site groundwater, which is much less than the regulatory standards.

The GWPLs used in the groundwater transport assessments are based on the assumption that site groundwater can be used as drinking water. Although drinking water standards were used in the assessment of radionuclide transport from the disposal cell, the site groundwater is not a realistic source of drinking water because of its high salinity and the low yield of the aquifer. Indeed, groundwater concentrations at some site wells exceed the GWPLs by an order of magnitude due to the naturally occurring background levels of a variety of naturally occurring constituents.

4.0 Lack of Public or Inadvertent Intruder Receptors at the Clive Facility Site

Federal regulations for near-surface land disposal of low-level waste are provided in 10 CFR 61. In the original risk analysis carried out to support development of 10 CFR 61, two types of receptors were defined: a public receptor who engages in residential, agricultural, or other activities at the boundary of the disposal site, and an inadvertent intruder who engages in these activities on the disposal site (NRC 2008). It was assumed that these residential, agricultural or other activities were consistent with current regional practices (NRC 2008). Because of low rainfall, high groundwater salinity, low aquifer yield and salinity of the site soils, many of the potential pathways used in the l0 CFR 6l risk assessment do not exist at the EnergySolutions Clive facility site. For example, site groundwater cannot be used for drinking water or crop irrigation. These site conditions have precluded human habitation in the past and make future human habitation and associated exposure pathways extremely unlikely.

In addition to the natural characteristics that preclude a public receptor or inadvertent intruder at the Clive facility site, the engineered disposal cell cover would limit the potential radon dose to any transient receptor. The uppermost portion of this cover is composed of rip rap that limits erosion and serves as an intrusion barrier.

5.0 Summary and Conclusions

Site-specific groundwater transport modeling for waste disposal at the EnergySolutions Clive facility has demonstrated that uranium can be safely placed in the disposal cells, even when the waste is assumed to contain uranium isotopic concentrations that greatly exceed plausible concentrations, along with significant concentrations of uranium progeny (Whetstone 2000, 2007, 2009). The chemical risks associated with DU are the same as natural uranium and the radiological risks of DU are likely to be much smaller than those assessed by the groundwater transport calculations. These site-specific calculations included a number of conservative assumptions that resulted in the overestimation of radionuclide transport through the groundwater to the compliance well location.

The results of these site-specific performance assessments demonstrate that large quantities of DU can be safely placed in the Clive facility, because significant radionuclide transport through the groundwater will not occur. The low rainfall, lack of potable water and saline soils make the site unsuitable for present-day or future habitation. The radon barrier and the intrusion protection function of the engineered cover would provide protection to receptors exposed through a non-resident exposure scenario.

Response

See General Response to Comment 39, Nos. 4 and 5.

Comment 39.31 (Whetstone)

Whetstone Associates performed fate and transport modeling of uranium and daughter products for the EnergySolutions Class A cell, Class A North, and Class A South disposal cells for a period of over 10,000 years after cell closure. The modeling was performed using the PATHRAE-RAD model (Merrell, et al, 1995). The methodology and input parameters were identical to the previously approved Class A cell modeling (Whetstone, 2000) except that six uranium decay chains were modeled and the model output time was extended to 12,000 years (2,000 years beyond the time period of interest).

Model Input Parameters

The PATHRAE model was run using the input parameters described in the Class A Cell modeling report (Whetstone, 2000), including infiltration rate, path length, moisture content, vadose zone velocity, and aquifer velocity. Six decay chains for uranium were modeled:

1. *Cm-244 → Pu-240 → U-236*
2. *Pu-240 → U-236 → Th-232*
3. *Am-243 → Pu-239 → U-235*
4. *Pu-238 → U-234 → Th-230 → Ra-226*
5. *Pu-242 → U-238 → U-234*
6. *U-238 → Th-230 → Ra-226*

Sixteen isotopes were modeled, including six uranium isotopes (U-232,U-233, U-234, U-235,U-236, and U-238), nine isotopes important in the decay chain calculations (Am-243, Cm-244, Pu-238, Pu-239, Pu-240, Pu-242, Ra-226, Th-230, Th-232), and one isotope as a comparison to previous modeling results (K-40). All 16 isotopes listed in Table 1 were modeled in both the vertical and horizontal modeling runs. In previous modeling (Whetstone, 2000), only Am-243 and K-40 were carried forward to the horizontal modeling, because none of the uranium species arrived at the water table within 1,000 years.

Source concentrations in the model were set at the maximum concentrations for Class A waste (10 C.F.R. 61.55). This approach is conservative, because it assumes that all of the waste is received at the highest concentrations for all constituents. In reality, many waste streams received at the facility will be well below the Class A low-level radioactive waste limits for specific nuclides. Maximum waste concentrations in pCi/g were converted to Ci/m3 using the average waste bulk density of 1,800 kg/m3.

The model was run for both the top slope (0.265 cm/yr infiltration) and side slope (0.364 cm/yr infiltration) conditions. The infiltration rates, moisture contents, aquifer hydraulic properties, and transport distances used in the fate and transport modeling for uranium species are applicable to the Class A cell, Class A North, and Class A South disposal cells listed in Table 2 because the limiting case with the highest infiltration rate (0.364 cm/yr) and shortest transport distance (90 feet to the compliance well) are included in the modeling. PATHRAE model input parameters for the top slope are shown in Table 3 and for the side slope are shown in Table 4.

Model Results

Vertical Model Results

Vertical PATHRAE modeling was performed for the 0.265 cm/yr top slope and the 0.364 cm/yr side slope. The top slope modeling results indicate that five of the seven uranium species (U-234, U-235, U-236, and U-238) would exceed Ground Water Protection Levels (GWPLs) at the water table directly beneath the embankment in 5,000 - 8,300 years after cell closure (Table 5). Uranium concentrations at the water table under the top slope area of the cell would peak at approximately 19,000 years after cell closure, below the top slope. U-232 and U-233 have relatively short half lives, and would not arrive at the water table at concentrations exceeding GWPLs.

The side slope modeling results indicate that five of the seven uranium species (U-234, U-235, U-236, and U-238) would exceed GWPLs at the water table directly beneath the embankment in 3,600 - 6,000 years after cell closure (Table 6). Uranium concentrations at the water table under the side slope area of the cell would peak at approximately 13,000 years after cell closure, below the side slope.

A complete listing of output times and concentrations at the water table is provided in Table 7 for the top slope

and Table 8 for the side slope. All 16 constituents were carried forward from the vertical modeling into the horizontal modeling.

Horizontal Model Results

The horizontal modeling results (Table 9, Table 10) indicate that none of the uranium species modeled would reach the compliance well within 10,000 years.

Concentrations of K-40, which was run as a surrogate, are similar to the results from previous modeling for the early output times (100 through 1,000 years) which confirms that the longer term model results are comparable to the previously approved modeling results. However, the results are not identical due to differences in timestep discretization. The previous model required very short timesteps during the early years, while the 10,000 year model uses a 100-year timestep. Because uranium does not arrive at the water table before 1,000 years, the coarser timestep used in the current modeling is appropriate for modeling uranium species.

Summary

The fate and transport of uranium species disposed in the Class A cell was evaluated using the PATHRAE model. The model was run for over 10,000 years, for both the top slope and side slope areas of the cell. The modeling indicates that although uranium species would exceed GWPLs at the water table in 5,000 - 8,300 years for the top slope and 3,600 - 6,000 years for the side slope, uranium would not arrive at the compliance well within 10,000 years. Uranium concentrations in groundwater at the compliance well would remain well below GWPLs for at least 10,000 years.

Response

See General Response to Comment 39, Nos. 4 and 5.

<u>Comment 40</u> (Oral Comments at public hearing)

<u>Comment 40.1</u> (Ed Firmage)

For the last year, the DEQ has struggled to deal with the consequences of the NRC's shockingly shortsighted and scientifically-indefensible decision to classify depleted uranium as Class A low-level waste. The proper response from Utah to this decision should have been, and still could be, to ban depleted uranium all together. In view our State's relationship with EnergySolutions, however, this seems unlikely.

The least, therefore, that our State should do is to ensure that appropriate new measures are in place to limit future damage. DU violates every essential definition of true low-level waste. It becomes more, not less, radioactive over time. And it is long lasting. EnergySolutions Clive facility is designed for waste with a short half life and relatively low levels of radioactivity. On this basis alone, storing DU at Clive must necessarily involve extra site-specific measures.

But concerns about longer lived and eventually more potent radioactive material are not the only reasons that new, much more stringent requirements should be in place. EnergySolutions touts Clive as a remote and arid facility ideal for storing dangerous material. On the time scale of true low-level waste, this claim is not inaccurate. On the time scale of DU, however, it is entirely misleading. Clive is located at the bottom of historic Lake Bonneville, which has inundated the area several times in the last 100,000 years. In geologic time, which is what we're talking about with the active life of DU, it is near certain that Lake Bonneville will return. And with its return, Clive ceases to be a remote, arid anything. The integrity of Clive will be destroyed by wave action, and radioactive material could be dispersed by currents, storms and the rise and fall of the lake to every part of the basin and potentially beyond.

It is therefore incumbent on Utah, if it will not do the sensible thing and ban DU all together, to provide a higher level of safety for DU storage here than currently applies at Clive. It should be the purpose of the RCB's new rule to ensure that this is the case.

Response

The commenter's support for the rule is noted. The request for a rule to ensure that no depleted uranium comes to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment No. 40.2 (Robert Henline)

"The Utah Division of Radiation Control protects Utah citizens and the environment from sources of radiation that constitute a significant health hazard." These words were taken from the Utah Division of Radiation Control website, in Director Finerfrock's welcome message. I think it unfortunate that I need to come before the Board to remind you of your obligation to Utah's people and her environment, but the Board's recent refusal to act in any interests but those of corporate greed does, in fact, necessitate such a reminder.

There is no doubt that depleted uranium poses a significant health and safety risk. There is not a credible scientific expert that will contest this simple fact. It is a substance that is not only toxic for billions of years, it also becomes increasingly toxic over time. This, we know. What we don't know is if the EnergySolutions Clive facility is capable of storing this waste safely. Let me repeat that. We don't know if that facility is capable of safely storing the depleted uranium.

In a letter dated 21, September 2009, EnergySolutions' president, Val Christensen, stated, "EnergySolutions has contracted with Neptune and Company, the industry-recognized experts in the field of performance assessments, to provide an updated performance assessment for depleted uranium disposal....We anticipate that the performance assessment will be provided to your staff by December 2010." What this tells us is that the facility at Clive has not been properly evaluated for the safe, long-term disposal of depleted uranium by the admission EnergySolutions. Yet, they still demand the right to import this deadly substance and to dispose of it on out land in our backyards.

It is now time for the people of Utah to make a demand of their own, a demand that this body live up to its obligations and act in the best interests of the people and the environment of Utah, not a corporation that has repeatedly demonstrated its disdain for the rules and regulations meant to protect us. What that means, ladies and gentlemen, is that as you evaluate the regulations regarding disposal of depleted uranium, you err on the side of caution, on the side of protection, on the side of doing the job as you've accepted it. And unless and until it can be proven that this toxic waste can be safely and permanently stored at this facility, your jobs and your integrity that you have taken demand that you refuse to allow this waste to come into Utah.

Response

The Executive Secretary has interpreted this comment as supportive of the rule. Note that technical concerns about the performance assessment will be addressed through the performance assessment process. *See* Part F, Response No. 1.

Comment No. 40.3 (Cindy King)

Hello. My name is Cindy King. And I'd like to make my comments very brief.

I'd like to congratulate the Division of Radiation Control for its due diligence in taking upon a risk that's bigger than they actually need to do. I'd like to encourage them to make sure that they prove without a reasonable doubt that if they're going to dispose of depleted uranium, that EnergySolutions can do so. To date, the record of that facility does not speak for safety, does not speak for protection and does not speak for public health.

Response

The commenter's support for the rule is noted. Please note that the Proposed Rule would require completion of a performance assessment that would demonstrate compliance with NRC's Performance Objectives. The standard for that demonstration is found in 10 CFR § 61.40:

> Land disposal facilities must be sited, designed, operated, closed, and controlled after closure so that reasonable assurance exists that exposures to humans are within the limits established in the performance objectives in §§ 61.41 through 61.44.

By regulation, then, the standard is demonstration of reasonable assurance, not proof beyond a reasonable doubt. The latter standard of proof is generally not used in regulatory or civil matters.

Comment No. 40.4 (George Chapman)

Specifically, with regards to the rule 313-25-8 proposed, I recommend you put in birds. All you have in the way of animals is burrowing animals, and based on past experience with EnergySolutions, they will use that to drive more DU in. It's a loophole you need to close. Again, I recommend you add specifically birds. We don't want radioactive seagulls flying around.

I also recommend that you put in something about monitoring directly the barrel viability, because those barrels aren't supposed to last more than 50 years.

I also recommend, and I understand the performance assessment coming will indicate the curies, but it is important for this rule that curies be limited and specified. And that's the only way to monitor, really, radiation.

Also, earthquakes are not listed here. And I think it's mentioned a couple of times in other rules, but I think you specifically have to mention that in the event of an earthquake there should be better monitoring.

And again, the biggest issue with regards to this rule is there is a drop dead date of March 1st. Between now and March 1st, EnergySolutions, in their mind, can do anything they want. And I strongly recommend you somehow make it clear that EnergySolutions is not allowed to bring in anything else until this rule goes into effect and they prove, through a performance assessment, that it's safe.

Response

The commenter's support for the rule is noted. With respect to the request to expand the analysis from burrowing animals to consider birds, that is beyond the scope of this rulemaking. To the extent contamination of birds could impact the ability of a facility to meet NRC Performance Objectives, and with respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment No. 40.5 (John Cuomo)

As a citizen of Utah, as a Ph.D. research scientist, I'm quite concerned about the safety of Utah's citizens and future generations, and risk of contamination exposure from depleted uranium. I, therefore, fully support a course of action to devise a new rule to ensure that no depleted uranium comes to our state in advance of the completion of thorough public health studies and performance assessments.

We need to fully evaluate the health effect, the level of possible exposures and the timing of peak radiation dosing.

In addition, the ruling should take into account the possibility of geological events that could occur during the

storage period, including flooding, earthquakes or other likely events that could impact the security of these stored materials.

Response

The commenter's support for the rule is noted. With respect to the request to consider peak dosage, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological process, please *see* Part F, Response No. 1.

Comment No. 40.6 (Claire Geddes)

I'd like to thank the Board for the time and effort they've put into looking at this issue.

I'm convinced that this isn't a safe disposal for depleted uranium. Most of the time, they're using a clay liner in there. In studying clay liners, clay liners heave in an area where you have freeze and thaw. And they're not something that's going to keep anything from coming through. So this seems to be more suitable to deep geological burial.

I also am concerned about the concentrations of the toxic metals, and hope that this'll be looked at just as much as the long life of the depleted uranium.

It just makes good sense that we shouldn't be putting anything out there that we aren't absolutely sure is suitable for that area. And as many others have said, I don't think there's any proof that this is suitable.

I'm also concerned that what we may see here is someone come in, EnergySolutions will go out and hire a firm to tell us that it's okay. They'll bring it to Dane Finerfrock, and Dane Finerfrock will say, "Yeah. It's okay." That's kind of the way we've done things in the past. I find that very unsuitable. Most people want an independent report on this anyway, not the company that's trying to get the waste in to go out and authorize it. So that's a real concern of mine, how we're going to look at this report, how this report is generated.

So I would urge the Board to look at those issues and also the issues that the others have talked about, earthquake, flood, all of the natural disasters that could happen that would impact that site.

I appreciate the work the Board's done. I think they need to be vigilant on this. And that nothing should be put in the ground until there's definite proof, and I don't know how they can ever prove that, that it would be safe.

Response

The commenter's support for the rule is noted. The concern expressed that no depleted uranium should come to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the request to consider clay liners, toxic metals, earthquakes and floods, please *see* Part F, Response No. 1.

With respect to the request that the agency rather than the licensee conduct the performance assessment, it is the licensee's obligation to demonstrate that it meets NRC Performance Objectives. The DRC anticipates an extensive review role, with contractor support, of analyses submitted by the licensee. *See* Part F, Response No. 3.

Comment No. 40.7 (Steve Nelson)

My concerns with the rule are that the 10,000-year performance period is too short and that the requirement for only a qualitative analysis out to the time of what is currently in the rule peak doses is inadequate. And I think there are some other requirements in the rule that conflict with that.

And I'll be providing the Board with lengthy written comment.

There is some things -- just a few things I wanted to express tonight.

First of all, I was concerned with the audio that I listened to regarding some of the staff discussions from December talking about the probability of repeated flooding having to do with the stars being aligned. Long-term hazard assessment in the geological sciences is based upon the observation of past behavior of natural system. And the past behavior of this natural system is telling us that the lake has expanded to the elevation of Clive at least five times -- or has reached the elevation of Clive at least five times in the last 150,000 years.

In other waste regulatory programs, we have the concept of what is called a "disruptive event." This is a feature event or a process that could disrupt the containment integrity of a storage facility. And usually the point, the tipping point at which you have to consider in a performance assessment a disruptive event is if it has a one in 10,000 chance of occurring in 10,000 years. Our analysis shows that it has about a one in three chance of occurring in 10,000 years. Much, much higher than the threshold.

Some other things we will show, that if the 60,000 tons -- and I realize that's an upper limit based upon EnergySolutions' good faith estimates of what's been placed in the past -- but if you take the upper limit of 49,000 tons, plus 11,000 that are on their way, and dissolve them in a lake that has expanded to the elevation of Clive, you get a concentration of uranium in water that is .25 parts per million, which, by the way, is about eight times the Environmental Protection Agency limits for water.

If the market place is opened, if the more than a million tons of depleted uranium, which are anticipated to be produced in addition to the inventory that's already in existence, if a million tons are buried out there and dissolved in that lake, it will exceed the EPA limit on uranium in water by about 140 times.

And by the way, uranium oxides are fairly soluble in waters. A recent study from 2000, at the Idaho National Engineering and Environmental Lab, showed that uranium oxides are soluble at about 100 parts per million. That's -- I haven't done the math, but that's undoubtedly a few thousand times the EPA limit.

So some recommendations, which I am going to put forth for the Board:

From the discussions that the Board had in December, they were concerned about the ability to have realistic models that extend beyond 10,000 years. Well, I happen to agree with that, but that is no excuse for inadequate protection and not modeling out longer than that. If they want to take time out of the equation, the EnergySolutions' contractor can assume the full activity of depleted uranium as its daughter's ingrown into the model at time equal zero. If, as I heard from the audio, if they're going to assume flooding, they can assume that a shore line develops at EnergySolutions on piles for an extended period of time. If we're concerned about things like differential compaction as we're concerned about in the rule, they can assume that the lake returns to the Provo level, which is about 460 feet higher than the elevation of EnergySolutions. And they can model what will happen in terms of differential compaction in enhanced seepage due to a water column that's 460 feet deep.

More importantly, it is my very strong recommendation that the Board, and not the DRC staff, read and respond to all public comment. The Board wrote the draft rule, the Board should read and respond to the input.

And finally, a final recommendation would be that an independent peer review panel be formed, not a contractor to DRC, not DRC staff, but an independent, multi-disciplinary peer review panel be formed to review the performance assessment.

As a final statement, I heard EnergySolutions acknowledge that they were going to consider flooding in their model. And so my immediate reaction was, of course, if they have to consider flooding in the model, isn't that an implicit assumption that this is the wrong place for the storage of depleted uranium?

Response

These comments reflect written comments submitted by the same person (co-authored with two others). *See* Response to Comment No. 27.

<u>Comment No. 40.8</u> (Geri Roos)

It disturbs me that this company believes that the citizens of this state are so dumb that we don't understand what is going on. One thing that we do understand is that this is very nasty waste that we are talking about. Waste that becomes more dangerous with time. And no one wants it. Thus, the other states would like to ship it off to Utah

under the assumption that we are just a wasteland and good for nothing else. Many people love that wasteland and do not want to see it destroyed.

I stand with the Board to find new rules to ensure that no depleted uranium comes to our state ever, or at least until a complete and thorough performance assessment can be made. EnergySolutions and other states would have us believe it is perfectly safe. Never mind that 84 percent of the citizens of this state are opposed to our becoming a radioactive waste dump. It doesn't matter if we don't understand all the scientific information about it, what matters is we don't want it. Just like the other states don't want it.

As regulators, you should determine if it can be safe. Please remember, what may be safe today, may not be safe tomorrow. This state is prone to earthquakes, and when Mother Nature hits, man is powerless. Haiti is a prime example of that. And we don't know what the Great Salt Lake is going to do.

Utah has done it's share of storing dangerous waste. Now, let's let the other states step up to the plate.

Response

The commenter's support for the rule is noted. The request to ensure that no depleted uranium comes to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2 with respect to this and with respect to the lack of public support for radioactive waste disposal. With respect to the request to consider future impacts, please note that the Proposed Rule requires a qualitative review of simulations for peak dosage. With respect to the request for consideration of geological processes, please *see* Part F, Response No. 1.

Comment No. 40.9 (Christopher Thomas)

I want to start by thanking the Radiation Control Board for looking at this rule in the first place. And I want to thank everybody who is here in the audience who came out because this issue is so important.

Our State is at a crossroads. 5,000 drums of depleted uranium await disposal at EnergySolutions nuclear waste dump site 80 miles west of where we sit tonight. Thousands more are lined up in South Carolina waiting to be loaded and shipped across the country here to Utah. Because the threat from depleted uranium is so great and so long lived, the choices we make today will literally impact Utah's health and environment forever. The stakes are great and the new standards proposed by the Utah Radiation Control Board cannot be enacted soon enough. We are racing the clock, attempting to close the door before the Department of Energy sends two more train loads full of depleted uranium to Utah. Because the Department of Energy has decided that spending stimulus money to send nuclear waste to Utah is more important than respecting Utah's democratic process and is more important than ensuring this waste is held to more rigorous health and safety standards, we are counting on you and the Board to enact these new standards quickly.

It's important to remember that it did not have to be this way. When the Federal Government first looked at low-level waste, it recognized that large amounts of concentrated depleted uranium should never be buried in landfills, like EnergySolutions, period. Under those first draft rules, the drums of depleted uranium that now threaten us would never have been eligible to come here in the first place because these drums would have exceeded the allowable limit by ten times. The more than 700,000 tons of depleted uranium stockpiled around the country would be classified as greater than Class C waste, and would have been required to be disposed far below the earth's surface.

As we now know, the Nuclear Regulatory Commission did away with the proposed limits on depleted uranium because, quite frankly, they didn't anticipate the million-ton depleted uranium problem that we now face. In fact, the NRC only assumed that 17 curies of depleted uranium, total, would be disposed at a site like EnergySolutions. The amount that we are now threatened with is thousands of times greater than that amount.

The radioactivity of depleted uranium is most like transuranic waste, and the National Research Council acknowledged this in a report released in 2003. "If treated like transuranic waste, depleted uranium would need to be disposed in a mined salt cavern in New Mexico 2,000 feet below the earth's surface." Scientists and engineers have mentioned this fact to me repeatedly. They have said our country already knows how to deal with waste like this, it needs to be put in a deep geologic disposal.

But instead, the Department of Energy has put a bullseye on the State of Utah and wants to bury a billion-year hazard in a landfill made of dirt and rocks and concrete, that scientists tell us will likely be washed away by the nearby Great Salt Lake over the next tens of thousands of years. This defies science, logic and basic common sense.

The way we deal with nuclear waste in this country and internationally comes from a very simple concept. The concept is that future generations should not have to pay for the nuclear messes we make today. They shouldn't have to pay with their health and they shouldn't have to pay with their resources. We know now that depleted uranium grows in radioactive hazard, starting in 1,000 years, peaking at a million years and then remaining at that high level of radioactivity for billions of years. Seen from a more global view, depleted uranium only meets our Class A limit on nuclear waste for far less than one percent of its hazardous life. We know now that EnergySolutions was only designed to limit radioactive releases for up to 1,000 years, a limit that is grossly insufficient to meet this hazard.

The more I learn, the more I've talked to experts in the field, even considering putting depleted uranium here in Utah is a gross misjudgment. We would rather not have this waste here at all period. But if we cannot stop it outright, then we must hold it to a much, much higher standard. And the rule you're accepting comment on tonight is a step in that direction. But it must be made even stronger.

First, the new studies required by this rule must be transparent and they must be open to public scrutiny. It is shocking to many that EnergySolutions gets to choose and pays for the new safety study that will be required. How do we ensure that this black box of a study is rigorous enough and conservative enough that it will actually be protective of Utah's public health and safety for the foreseeable future? The first thing we need to do is require that before the Executive Secretary can accept a performance assessment as complete, it must be made available for public comment, there must be a finding of fact issued and it must be open to public review and comment.

Second, this performance assessment that is undertaken must be no less rigorous than the studies that the NRC originally performed to create the whole A, B, C waste classification system. They looked at very specific issues where people would come into contact with the waste at future times. And those same scenarios must be considered at a minimum in any new performance assessment that EnergySolutions has to do.

Third, disruptive events or any events that could cause a catastrophic failure of the EnergySolutions landfills must be looked at. And I think that the disruptive events mentioned by Dr. Nelson may be a very good place to start. We have a model already for how to look at the safety of waste that lives -- that is hazardous for many, many thousands of years of high-level waste, and we should, where appropriate, adopt the same standards here for depleted uranium because of the long-lived hazard.

There also must be a very clear line distinguishing what threshold makes depleted uranium supposedly acceptable for disposal versus unacceptable for disposal. I am shocked that the Nuclear Regulatory Commission, in their recent analysis, accepted a two percent success rate as evidence that depleted uranium could be disposed of safely. I mean, to me, that's 98 percent evidence that near service disposal is absolutely inadequate. And I think in this case, we must consider something like a 95 percent bar that must be met before depleted uranium would be considered safe to come to Utah.

We must also take into account changes in climate that can happen over tens of thousands of years. I've heard experts talk about this at great lengths, and there's no way that using the last 40 years of precipitation out at the Clive site can be used to then predict the changes in climate that can happen over the next several thousand years. It just doesn't make sense.

And along those same lines, I've heard that, you know, modeling beyond 10,000 years is difficult. Well, it's difficult to know what'll happen. It's difficult to have a crystal ball and to see exactly what will happen. That should be absolutely no excuse for allowing depleted uranium waste into this State. Our rules, our law in Utah requires scientifically defensible modeling to support, you know, the conclusion that a certain site would be safe for waste. Of any kind. And I think if looking at more than 10,000 years is a high bar to set, that's a high bar that EnergySolutions should be expected to meet and meet fully. There is no reason we should have a less -- reduced standard for waste that's dangerous for a longer time.

I'm prepared to submit more detailed written comments before the close of the public comment period on February 2nd that will detail more of what I think should be in the rule to ensure that Utah's public health and safety is protected.

But in conclusion, this is what I want to say: Utah deserves very strong protections. We deserve regulators who have the expertise, resources and will to enforce those protections in the strongest possible way. And we need leadership in the Governor's Office to ensure that no one, including and even especially the Federal Government, no

one is given free reign to circumvent or preempt those protections.

Response

The commenter's support for the rule is noted. The request to ensure that no depleted uranium comes to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2. With respect to the many comments regarding what should be considered in the performance assessment, please *see* Part F, Response No. 1.

The comments regarding the procedure for reviewing the performance assessment are noted, but are also beyond the scope of this rulemaking. *See* General Response, Response No. 3, however.

Comment No. 40.10 (Amy O'Connor)

I'd like to start by saying I would encourage the Committee to not allow one more ton of DU into Utah. However, for the sake of clarity and exactness, what I would like to bring to your Committee today is a paper by -- that was written in 2003 by the National Research Council. It's entitles, "Improving the Scientific basis for Managing DOE's Excess Nuclear Materials and Spent Nuclear Fuel." And it outlines many of the potential health risks that I'm very much concerned with.

And let me just read this to you, again, for the sake of clarity.

"Options for future disposition of DU, once converted to oxide, are continued storage, reuse and disposal as waste. There are significant gaps in understanding health effects of uranium and its compounds that need to be resolved before DOE can fully evaluate these options. Beneficial ways to reuse large amounts of uranium have not been identified. Because of uranium's unique chemical and physical properties, the Committee believes that this lack of reuse options reflect gaps in current knowledge rather than being a reason for disposing of the material as waste. There are significant challenges for deciding how the uranium might be disposed if it were declared to be waste."

They address disposal.

"The current plans for conversion to oxide will put the DU in a form that will be more stable than the DUF6 for further storage. If disposal is necessary, it is not likely to be simple. The alpha activity of DU is 200 to 300 nanocuries per gram. Geological disposal is required for transuranic waste with alpha activity above 100 nanocuries per gram. If uranium were a transuranic element, it would require disposal in a Waste Isolation Pilot Plant based on its radioactivity. The chemical toxicity of this very large amount of material would certainly become a problem as well. One option suggested by the U.S. Nuclear Regulatory Commission is disposal in a mined cavity, or former uranium mine. Challenges for this option would include understanding the fundamental differences between uranium ore and the bulk uranium oxide powder."

As for long-term research for reuse and disposal: "The World Health Organization has compiled a list of the research needed to better assess chemical and radiological health risks from exposure to uranium compounds. The Committee believes that this research will assist the DOE in its future decisions for reusing or disposing of its DU."

And as an aside, I just encourage the Committee to carefully look at these and make sure that they are addressed in your rule.

First, "Neurotoxicity: Other heavy metals are known neurotoxins, but only a few studies have been conducted on uranium. Studies are needed to determine if DU is a neurotoxic. Reproductive and developmental effects have been reported in single animal studies, but no studies have been conducted to determine if they can be confirmed or that they can occur in humans."

Second, "Hematological effects: Uranium distribution within bone is thought to be such that irradiation of bone marrow and blood-forming cells are limited due to the short range of alpha particles emitted during decay. Research is needed to determine if this view is correct."

Third, "Genotoxicity: Some in vitro studies suggest genotoxic effects occur via the binding of uranium compounds to DNA. Research is needed to determine if uranium is genotoxic by this or other mechanisms. There are also opportunities to extend current knowledge in the following areas:

"Understanding of the extent, reversibility and possible existence of thresholds for kidney damage in people exposed to DU. Important information could come from studies of populations exposed to naturally-elevated concentrations of uranium in drinking water.

"Better assessments of impacts of exposure of children. This is particularly important given their unique exposure scenarios such as geophagia and hand-to-mouth activities.

"Validation of transfer coefficients for uranium compounds entering the food chain, for example, from soil ingested by livestock during grazing and then to humans. Investigations are needed on the chemical and physical form, physiological behavior, leaching and subsequent environmental cycling of specific forms of uranium from various industrial and military sources. Particular attention should be paid to how the bulk of DU might eventually be deposed. Aside from the possible presence of containments in some of the DU from recycled uranium, the isotope enrichment process leaves a material that initially has a lower radioactivity than natural uranium. Not only U-235, but most of the uranium decay chain isotopes are removed. Modeling the long-term behavior of DU should include the fact that these daughter isotopes will gradually reappear over time."

So as you can see, "all of these considerations," I believe, "should have been dealt with prior to EnergySolutions accepting any quantity of depleted uranium." Please, please ensure that each and every one of these serious, possible health risks is fully investigated before Utah accepts one more ounce of depleted uranium. And while I haven't, obviously, done all these studies, my personal feeling is simply that not one more ton should come to Utah.

Response

The commenter's concerns relate to appropriate exposure limits. Exposure limits for the general public are found in 10 CFR Parts 20 and 61, which are not proposed for change in the Proposed Rule. These comments are therefore outside of the scope of this rulemaking. Exposure limits that are not established by rule will be considered in the course of the performance assessment process. Please *see* Part F, Response No. 1 and Response to Comment No. 31.2.

Comment No. 40.11 (Joe Andrade)

Thank you for the opportunity to provide some input.

I'm going to read parts of a letter that I submitted to Governor Herbert about two weeks ago, and has been received by his staff. And I will, of course, leave that with you as a written comment.

"I am an engineer, professor and teacher with over 40 years on the University of Utah faculty. During 1983 to '87, I served as Dean of the University's College of Engineering. My office was almost directly above the University's small teaching nuclear reactor. I have used radioactive isotopes as research aids for my studies on blood proteins in the early part of my career. I am familiar with radiation, radioactive isotopes, their hazards and risks and generally their safety and disposal issues. I have tested my own basement for Radon, using the State's very effective resources. By the way, this is National Radon Awareness Month, or Radon Action Month. I'd encourage you all to do the same. My basement is on the borderline of requiring some mitigation. I am well aware of safety and risk issues and the problems of relative risks.

"We are all responsible for waste, radioactive, CO2 and otherwise. We want our garbage picked up. We don't want to breathe asbestos. We want efficient industrial processes, some of which use radioactive isotopes. We want safety and risk detection equipment, like smoke detectors, many of which use radioactive isotopes. Some of us want nuclear energy, which generates waste, most of that from the mining and enrichment operations for the reactor fuel. We want the most modern and effective medical diagnosis and treatment, many of which utilize radiation and radioisotopes. And we don't want any of this stuff in our own backyard. We want to mine Utah's uranium ores, coal, silver and gold to generate employment and taxes, but we don't want to fully face the health and environmental hazards involved.

"It's all a question of balance: minimizing reasonable risks and maximizing reasonable benefits.

"I am thankful that we have reasonable, appropriate and safe waste disposal facilities, such as the landfills we all use and the Clive facility under discussion. I am thankful that we have a State DEQ and Division of Radiation Control to help monitor and regulate such facilities. And I am thankful that our wastes, my wastes are located in

such facilities, and thus, not spread throughout our communities and environments and not in my own backyard or in yours. Some such facilities even eventually become resources, such as the energy generated via the methane at the County landfill.

"As I understand it, the depleted uranium coming to and already at Clive is low-level waste in the oxide form. Thus, not particularly chemically hazardous. The radioactivity is significantly less than the uranium ores common in many parts of Utah. Of course it decays, and some of its decay products are of concern, Radon in particular. The uranium in the soils and concrete in my basement also decay. And the Radon they emit is also of concern. But not of great concern. Half of the average background radiation dose we all get in this State is due to Radon. It's emitted in your basement, in mine, in the soils, in the concrete. Radon is a decay product of uranium. And uranium is actually a fairly common element in the earth's crust. You and I each have right now about a 100 micrograms of uranium in our bodies, according to the World Health Organization. We each carry in our own bodies the elemental makeup of Planet Earth, our own, personal periodic tables.

"I am far more concerned with our highly polluted air, leading to respiratory and related problems, with the rapidly increasing CO2 in our environment, leading to climate disruption and major planetary issues, with the increasing Mercury levels in the Great Salt Lake and in our waters and fish, and with many other environmental, social and community hazards, including auto accidents, gun accidents, domestic violence, substance abuse and child abuse.

"I'd encourage you all to arrange to test your office and basement for Radon.

"I also recommend that DEQ and the State encourage EnergySolutions to fully use the Clive facility to store low-level radioactive waste, including depleted uranium.

"I encourage the landfills, to keep taking and storing our other wastes.

"And encourage DEQ to continue to do the very best they can regarding the disposal and storage of the waste of our excessively consumption-oriented society."

Response

The comments are noted. It is not clear whether the commenter is opposing the Proposed Rule. To the extent he is, please *see* the Statement of Basis and Part A, above.

<u>Comment No. 40.12</u> (Helene Cuomo)

First of all, I'd like to thank the Radiation Control Board and say, whoa, we need to do more research in this and we need to put a halt and set up new standards and new rules before more of these barrels come in of depleted uranium.

And on my drive over here I was thinking about the down-winders. If we don't know somebody personally, we've heard about the down-winders. And at that time, the Government said all these nuclear tests were safe.

And then just recently we've been hearing about these open burn pits, how some of our combat soldiers are coming back and they have strange ailments, whether it's leukemia or trouble breathing. Some are even dying. And once again, the Government is slow, saying, you know, "We don't know what's going on." And I think down the road we'll find out, almost like Agent Orange, that there is stuff going on.

But the Government, who is supposed to protect us, it takes awhile for, I guess, the research to come in for them to admit, "Yeah. We can't let this hide."

And so when the NRC comes -- when they came this fall and they said, "They don't know," that really scared me. That here, we're supposed to know what to do with this depleted uranium when the Government is final saying, "We don't know." And that says to me we need to put a halt to this now, until we do know.

There is only a shallow site out at Clive. And the NRC said, "We don't know if that's safe. There hasn't been studies like that." And so, if the Government's taking that caution up front, I think we all need to listen. Because in the past, they haven't. And in the future, they might not. But if they're saying, "Wait. We don't know," everybody's ears should perk up.

And I'm very disappointed in Governor Herbert that -- I feel like he was doing it both ways. He waits and waits and waits, knowing that this stuff is coming to Utah unless he can put a halt to it or get the Radiation Control Board to get stuff moving, and then when it's already on the way, he writes this letter and there's big headlines in the paper,

"Governor asks to stop depleted uranium."

Well, we all know that was too late to do that.

And so I really thank the Radiation Control Board for having the guts and the fortitude to say, "Halt. Let's see what's going on." Because this stuff -- it's just going to get hotter. And we don't know. And until we figure it out more and if our Government officials aren't protecting us, I'm really happy that the volunteers -- or if you do get paid, it's very little, I presume -- that they do care about the safety of Utahans, about us now and about our future generations. Because we really don't know. And so we need to slow down. We need to stop. And let's listen to the NRC. We don't know. And that means more research needs to be done and more controls. And somebody needs to have the back bone to say, "Halt," before it's too late.

Response

The commenter's support for the rule is noted. Other comments are beyond the scope of this rulemaking.

<u>Comment No. 40.13</u> (Sam Ghosh)

My name is Sam Ghosh. I am an engineer and retired professor from the University of Utah.

I do not have a prepared statement, but I had a few things, like putting water or washing down radioactive isotopes. The thing is as -- because I am a civil engineer I know, that once water gets into the ground, there is no telling which way it's going to go. It can stay static. The isotope, uranium 235 can be exchanged with minerals on the ground and stay there for awhile and then flushed out as it breaks through. So putting water under the ground with anything in it is very, very dangerous. Because we would lose track of it completely.

And many of these things have very long lives, so they're going to stay there for a long time. And they will keep emitting gamma rays. It is not going to stop. Because some of the half lives are tens of thousands of years.
There is one other thing that I have not heard mentioned, and that is the pressure we are now having from climate change. A lot of people think that climate change is happening because of fossil fuels and so let's go nuclear, so then we won't have the CO2 and the global warming problem. So then next some people are saying, "Well, let's cut out the fossil fuel and let's go with nuclear fuel." So there'll be more pressure to have nuclear fuel. So climate change, unfortunately, may trigger another problem.

EnergySolutions, I understand, was going to bring waste from Japan and other countries. I think one solution they may consider is send our waste to Japan.

Response

The Executive Secretary interprets this comment as supportive of the rule. With respect to the comments regarding uranium in groundwater, please *see* Part F, Response No. 1. Other comments are beyond the scope of this rulemaking.

<u>Comment No. 40.14</u> (Joe Nickols)

My name is Joe Nickols. And I did sign something over there, but here I am anyway.

First, I'd like to say that I'm a recovering physics addict for 29 years sober. And I've seen the light then. And it's alarming that I'm seeing it through these regulations again.

I have to commend you on trying to make this at all possible. You know, it is an open forum, which is good. And trying to go from the laws of physics to man-made statutes is a pretty tall order. And it does take some more insight. And that's why I'm here.

One of the difficulties I've seen and I'm hearing is that a lot of these basic assumptions kind of get swept over and they're kind of lost in the technical part of these presentations. And energy is neither created nor destroyed, just transformed. So I think if you put that under the umbrella of that's a law of physics, you begin to see some of the

anxiety that the folks have.

One interesting thing I did discover was that the statutes make differences between "dispose," "deplete," "decay" and "industry" as stable. So here you're trying to figure out how to use land waste -- land for waste, which is invisible energy at this point. And I looked it up in a 1974 college physics book called, "Physics for the Life Sciences," and it seems to me that what's lacking is some way to standardize this. And the simplest way would be the ground states of this waste. And when you're hearing someone saying a container can only last 50 years, well, how long does it take this waste to go back to ground state, which physically means it's not emitting. So that would satisfy all the different types of emissions and different types of daughter particles that get made.

So I think in your policies, there needs to be something that's standardized, rather than something that is just made up and then amended and deleted on political will.

So in conclusion, the nuclear industry still can't find private insurance. And that, to me, is a great concern because when you're dealing with risk benefit ratios and then actuaries, this is not possible at this time.

So I'm saying that you need to put a halt on this. You need to develop a statute that actually goes by the law of physics and something easy to be able to tell the difference. And then this insurability is a concern for everyone, because every other industry has to work under some type of insurability. And years ago, when this started, part of that was a, you know, $50 billion bond, or I would say gold at this point. And I don't see that anymore.

So I just hope that you guys read this book and answer the arguments here today. I think it would put a lot of insight onto at least clarifying and creating some kind of standard that's either agreed on or mitigated on or gone through the courts. So I think a lot could be avoided but creating a standard that's physically attached to some science rather than half a technical story.

Response

The comments raised are not specific to the rulemaking proposed.

<u>Comment No. 40.15</u> (Bob Brister)

My name is Bob Brister. I'm a resident of Salt Lake City.

One of my favorite means of recreation is going out to the West Desert and enjoying our beautiful public lands out there. It really breaks my heart to see the West Desert treated as the Nation's toxic waste dump.

You know, the people of Utah have suffered tremendously over the decades, from the nuclear power/nuclear weapons industry, from the down-winders to the Navajo Indian miners of uranium, and I don't think the people of Utah should be made to suffer anymore from this industry.

I think it's a really sad reflection on the state of politics in Utah that a state that has suffered so much from the nuclear industry has so much of its political system bought off by the industry, apparently. EnergySolutions is a malignant corporation. I'd love to see its charter revoked.

And I urge the Radiation Control Board to be our last line of defense against nuclear waste dumping here in Utah, especially depleted uranium, which, as people have said so many times, just gets worse and worse over time.

Response

The request that no radioactive waste come to Utah is beyond the scope of this rulemaking. Please *see* Part F, Response No. 2.

ATTACHMENT 1

Proposed Depleted Uranium Performance Assessment Rule,
as Published January 1, 2010

DEPLETED URANIUM PERFORMANCE ASSESSMENT RULE
as proposed January 1, 2010

Note: Strikeout and underline show changes from current rules.

R313-12-3. Definitions. [No change proposed; included only for context.]

"Depleted uranium" means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.

R313-25-8. Technical Analyses.

(1) The specific technical information shall also include the following analyses needed to demonstrate that the performance objectives of R313-25 will be met:
~~(1)~~ (a) Analyses demonstrating that the general population will be protected from releases of radioactivity shall consider the pathways of air, soil, ground water, surface water, plant uptake, and exhumation by burrowing animals. 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. 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.
~~(2)~~(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.
~~(3)~~(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.
~~(4)~~(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.

(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.
(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 R. 313-25-8(2)(a).
(c) For purposes of this R. 313-25-8(2) only, depleted uranium means waste with depleted uranium concentrations greater than 5 percent by weight.

ATTACHMENT 2

Proposed Depleted Uranium Performance Assessment Rule,
as Recommended to the Radiation Control Board for April 2010 Board Meeting

DEPLETED URANIUM PERFORMANCE ASSESSMENT RULE
Proposed Rule as recommended to the Radiation Control Board
for April 2010 Board Meeting

Note: Strikeout and underline show changes from rule as proposed on January 1, 2010.

R313-25-8. Technical Analyses.

(1) The specific technical information shall also include the following analyses needed to demonstrate that the performance objectives of R313-25 will be met:
(a) Analyses demonstrating that the general population will be protected from releases of radioactivity shall consider the pathways of air, soil, ground water, surface water, plant uptake, and exhumation by burrowing animals. 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. 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.
(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.
(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.
(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.
(2)(a) Any facility that proposes to land dispose of significant quantities of concentrated 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 concentrated depleted uranium and other wastes, including wastes already disposed of and the quantities of concentrated 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~~ shall be a minimum of 10,000 years. Additional simulations ~~will~~ shall be performed for ~~a qualitative analysis for~~ the period where peak dose occurs and the results shall be analyzed qualitatively.
(b) No facility may dispose of significant quantities of concentrated depleted uranium prior to the approval by the Executive Secretary of the performance assessment required in R. 313-25-8(2)(a).
(c) For purposes of this R. 313-25-8(2) only, "concentrated depleted uranium" means waste with depleted uranium concentrations greater than 5 percent by weight.

ATTACHMENT 3

Utah Radiation Control Board
Statement of Basis for Administrative Rulemaking
Regarding Disposal of Significant Quantities of Depleted Uranium
December 1, 2009

UTAH RADIATION CONTROL BOARD
STATEMENT OF BASIS FOR ADMINISTRATIVE RULEMAKING
REGARDING DISPOSAL OF SIGNIFICANT QUANTITIES OF DEPLETED URANIUM

December 1, 2009

This Statement of Basis for Administrative Rulemaking Regarding Disposal of Significant Quantities of Depleted Uranium (Statement of Basis) has been prepared to support the proposed rule in Part VI of this Statement of Basis. If the Radiation Control Board votes to begin rulemaking on this matter, information about how and when to comment on the rule, including information about a public hearing, will be posted at http://www.radiationcontrol.utah.gov/.

I. REGULATORY AND FACTUAL BACKGROUND

Following is background information and descriptions of some of the most significant among many actions taken by the regulatory agencies discussed below regarding depleted uranium.[1]

A. What is depleted uranium and how is it similar to and different from other wastes?

> "Depleted uranium oxide contains approximately 85 percent uranium by mass. In comparison, a low-grade uranium ore common in the United States may contain 0.1 percent uranium by mass."
>
> . . .
>
> "For mill tailings, a significant portion of the total activity at the time of disposal is associated with radium, therefore disposal or management decisions can focus on the radiological inventory at the time of disposal. For example, a barrier to attenuate the emanation of radon from mill tailings can be designed based on the concentration of the material at the time of disposal. On the other hand, DU is essentially depleted in the daughter radionuclides but concentrated (compared to natural ore or mill tailings) in the parent radionuclides. Over long periods of time, the uranium parent radionuclides have the potential to produce quantities of daughter radionuclides significantly in excess of natural ores or mill tailings because the DU source has much higher concentrations of uranium. For example, mill tailings commonly have from 0.004 to 0.02 wt percent U3O8, 26 to 400 pCi/g 226Ra, and 70 to 600 pCi/g 230Th at the time of disposal (Robinson, 2004). Depleted uranium (in oxide form) would have approximately 99.9 percent uranium oxide at the time of disposal and greater than 300,000 pCi/g 226Ra and 230Th approximately 1 million years after disposal (values cited were calculated with a simple decay/in-growth calculation)."
>
> . . .
>
> "Whereas the activity in a commercial LLW facility decreases to a few percent of the initial value over a few hundred years, the activity in a facility for DU would be expected to remain relatively constant initially, but begin increasing at around 1,000 years. Peak activity, assuming no release from the source, would not be attained until after 1 million years after disposal."

U.S. Nuclear Regulatory Commission (NRC) Staff, SECY-08-0147.[2]

B. U.S. Nuclear Regulatory Commission actions

1. 1981-82: NRC developed its waste classification system and concentration limits for land disposal of radioactive waste, now found in 10 CFR Part 61*, based on modeling that informed what maximum levels of radioactivity would still allow 10 CFR Part 61 performance objectives to be met.[3] For this analysis, NRC did not evaluate environmental impacts of land disposal for significant quantities of depleted uranium. *See* Part II.B.1 of this Statement of Basis.

2. October 2000: NRC issued NUREG-1573, guidance for those conducting site-specific performance assessments for radioactive waste land disposal facilities.[4]

3. October 2005: The NRC Commission asked its staff to consider whether the signficant quantities of depleted uranium in the waste stream, which were not anticipated in 1981, warranted reclassification of depleted uranium or other amendments to NRC's regulations.[5]

4. June 2006: Louisiana Energy Services was licensed as a uranium enrichment facility. The facility will create a waste stream with substantial quantities of depleted uranium.[6] In the course of this proceeding, depleted uranium disposal at EnergySolutions was analyzed. The Commission rejected claims by an intervenor that Envirocare's performance assessment was inadequate and that NRC had previously found that depleted uranium could not be disposed of in a near-surface facility and that NRC could not therefore find that disposal at EnergySolutions was acceptable. While expressing concern that its Staff may not have fully explored the long-term impacts from the disposal of depleted uranium "whose radiological hazard gradually *increases* over time,"[7] the Commission nevertheless upheld the decision by the Atomic Safety Licensing Board. However, it noted in doing so that its decision on the adequacy of an Environmental Impact Statement was not intended to take the place of a Part 61 compliance review,[8] and that "[p]rior to a final determination on disposal, we would expect that the pertinent regulatory authority will have considered both the characteristics of the waste and the site-specific features of the disposal site to assure that all radiological dose limits and safety regulations indeed can be met."[9]

5. October 2008: NRC staff, in October 2008 (SECY-08-0147) responded to the Commission's October 2005 order.[10] The staff:
   (a) Evaluated a generic case to determine whether it was possible to meet 10 CFR Part 61 standards with near-surface disposal of depleted uranium, and concluded that it was.

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* There are Utah rules equivalent to 10 CFR Part 61 found in Utah Admin. Code R. 313. As appropriate, references to 10 CFR Part 61 should also be read as referring to the equivalent state rules. *See* endnote 1 for web access information.

(b) Prepared several regulatory options, and recommended that the Commission not change classification for depleted uranium, but add language requiring a site-specific performance assessment before significant quantities of depleted uranium are accepted for disposal.

6. October 2008: In the October 2008 SECY-08-0147 and in subsequent statements, NRC staff has also indicated that there are limitations to the generic case study described in Part I.B.5 of this Statement of Basis, and recommended that it should not be relied upon for any site-specific licensing action. *See* Part II.B.2 of this Statement of Basis.

7. March 2009: NRC agreed with the course of action recommended by the NRC staff in SECY-08-0147. The Commission made determinations:
   (a) To keep depleted uranium as Class A waste; and
   (b) To initiate rulemaking proposing enhanced performance assessment requirements for facilities proposing to dispose of significant quantities of depleted uranium.[11]

8. August 2009: NRC made a recommendation regarding any proposals to dispose of significant quantities of depleted uranium in the interim period before NRC's depleted uranium rulemaking process is completed.[12] It recommended that, prior to disposal of significant quantities of depleted uranium at a near-surface disposal facility, site-specific performance assessments should be evaluated against criteria developed in the October 2008 SECY-08-0147 staff analysis and in a Federal Register notice at 74 Fed. Reg. 30175 (June 24, 2009). See Part II.A. of this Statement of Basis.

C. Utah Division of Radiation Control actions

1. March 1991: Depleted uranium was first approved for disposal at Envirocare, but disposal was limited to volumetric bulky materials or structural debris with a concentration limit of 1.1 E5 pCi/g.[13]
2. October 1998: Envirocare's license was amended to approve an increase in the concentration limit to an average concentration per container of 3.7E5 pCi/g.
3. Approximately 1999: Envirocare submitted a performance assessment for a new proposed land disposal facility for Class A, B, and C wastes. The assessment showed that 10 CFR Part 61 performance standards would be met for very large quantities of depleted uranium based on the assumptions specified in that document. The performance assessment reported results from an analysis of 500 years.
4. October 2000: The Executive Secretary approved a license amendment for a new disposal cell for Class A waste. Disposal of depleted uranium in the new cell was not limited by concentration or quantity. Both diffuse and concentrated depleted uranium have been disposed of pursuant to this amended license; approximately 49,000 metric tons of depleted uranium have been disposed of at EnergySolutions to date.

5. September 2009: The license was changed, at EnergySolutions' request, to require that all wastes with depleted uranium concentrations greater than 5 percent (by weight) be placed a minimum of 10 feet below the top of the cover.

D. Other states' actions

1. Washington: In response to an inquiry in the course of the the NRC's Unique Waste Streams Rulemaking Worskhop held in Salt Lake City in September 2009, Washington State's representative responded as follows to this question:

> "Has the NRC or any of the agreement states that have low level waste sites been approached about reviewing the performance assessment of your particular disposal facility under this process?"
>
> "We've talked about it in good detail. I think the prudent thing we've decided is we really need to wait until this kind of works through because we could do a performance assessment that may not meet the criteria that the NRC ends up getting, and you'd end up having to do it twice. So I think from our standpoint we wait."[14]

2. Texas: In response to the same inquiry, the representative from Texas said:

> "We do not have a new performance assessment to review for the interim in Texas."[15]

Texas regulations state, regarding the licensing of radioactive waste land disposal facilities:

> "The specific technical and environmental information in the application shall also include the following analyses needed to demonstrate that the performance objectives of this subchapter, referenced in §336.723 of this title (relating to Performance Objectives), will be met:
>
> (1) Pathways analyzed in demonstrating protection of the general population from releases of radioactivity shall include air, soil, groundwater, surface water, plant uptake, and exhumation by animals. 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. The analyses shall clearly demonstrate that there is reasonable assurance that the exposures to humans from the release of radioactivity will not exceed the limits specified in §336.724 of this title (relating to Protection of the General Population from Releases of Radioactivity). A minimum period of 1,000 years after closure or the period where peak dose occurs, whichever is longer, is required as the period of analysis to capture the peak dose from the more mobile long-lived radionuclides and to demonstrate the relationship of site suitability to the performance objective in this section to the performance objective in §336.724 of this title."[16]

E. Standards governing the Board's rulemaking authority

Utah Code Ann. § 19-3-104(4):

> The board may make rules:
> (a) necessary for controlling exposure to sources of radiation that constitute a significant health hazard;
> (b) to meet the requirements of federal law relating to radiation control to ensure the radiation control program under this part is qualified to maintain primacy from the federal government; (c) to establish:
> (i) board accreditation requirements and procedures for mammography facilities; and
> (ii) certification procedure and qualifications for persons who survey mammography equipment and oversee quality assurance practices at mammography facilities; and
> (d) as necessary regarding the possession, use, transfer, or delivery of source and byproduct material and the disposal of byproduct material to establish requirements for:
> (i) the licensing, operation, decontamination, and decommissioning, including financial assurances; and
> (ii) the reclamation of sites, structures, and equipment used in conjunction with the activities described in this Subsection (4).

II. SUMMARY OF PRELIMINARY BASES FOR ACTIONS

Following is a summary of information particularly pertinent to the Board's proposed rulemaking action, although all of the information provided in this Statement should be considered part of the Board's basis.

A. NRC Recommendation.

1. For this interim period before completion of NRC rulemaking, The NRC has explicitly recommended that agreement states conduct a new review of performance assessments, prior to disposal of significant quantities of depleted uranium.

> "What is NRC's position regarding disposal of significant amounts of depleted uranium before the rulemaking is complete?"
> . . .
> "If a site wishes to dispose of significant amounts of depleted uranium, it would be prudent for the site operator and State regulator to review the existing performance assessment supporting the site and determine whether the issues that were raised in the technical analyses supporting the Commission decision to initiate this potential rulemaking and in the Federal Register Notice for the NRC public workshops are adequately addressed. If not, it would be prudent to revise the performance assessment to adequately address these issues on a site-specific basis before disposal of significant quantities of depleted uranium."

NRC's Frequently Asked Questions in the Communication Plan.[17]

NRC Staff has repeated this advice in other arenas, e.g., its Unique Waste Streams Rulemaking Record.[18]

2. The NRC did not define the quantities of depleted uranium that would have to be land disposed before raising concerns, but it did define "small quantities," 1 to 10 metric tons of depleted uranium that could, it concluded, be disposed of at shallow depth.[19]

B. Past environmental analysis.

NRC has recognized that there has been no adequate analysis of the health and safety-related impacts of near-surface disposal of depleted uranium.

1. The NRC has acknowledged that at the time the initial classification system for radioactive waste was created it was not anticipated that significant quantities of depleted uranium would be disposed of in near surface facilities. It also acknowledged that environmental studies done did not address the significant quantities that are now expected.

> "At the time of development of [10 CFR] Part 61, it was envisioned that [low level radioactive waste regulated in that Part] in a disposal facility would decay, in a maximum of 500 years, to activity levels that would not pose a significant risk to an inadvertent intruder, and that there would not be significant quantities of long-lived isotopes which would pose unacceptable long-term risks to the public from releases from the facility. In developing Part 61, NRC considered longer periods of institutional control in the DEIS (NRC, 1981). Assumptions about the persistence of institutional controls in the international community were considered and a series of public meetings were conducted to get input from stakeholders. The consensus among the stakeholders was that it is not appropriate to assume institutional controls will last for more than a few hundred years. The resultant regulatory framework for commercial LLW disposal assumes material that does require institutional control for much longer than 100 years to demonstrate compliance with the performance objectives would generally be determined to not be suitable for near-surface disposal as LLW ."

NRC, SECY-08-0147.[20]

> "When NRC regulations on low-level waste disposal were developed, there were no commercial facilities generating significant quantities of depleted uranium waste. Therefore, the impacts of depleted uranium disposal were not explicitly considered."

NRC Fact Sheet on Depleted Uranium and Other Waste Disposal.[21]

> "Large quantities of uranium were not evaluated in the EIS for 10 CFR Part 61
> - 17 Ci of 238U (in 1 million m^3 of waste)
> - 3 Ci of 235U
>
> The quantity of DU [now entering the waste stream] is ~ 470,000 Ci 238U."

NRC's Unique Waste Streams Rulemaking Record, Workshop Presentations.[22]

2. NRC staff has advised against using its October 2008 analysis (SECY-08-0147), which was done to support the NRC Staff's rulemaking recommendation, for site-specific licensing purposes.

> "The model was developed to evaluate the radiological risk to potential future residents and intruders (acute or chronic exposures) near or on the land overlying a hypothetical disposal facility for DU. The model was designed to provide the user with flexibility to evaluate different waste forms, disposal configurations, performance periods, institutional control periods, pathways, and scenarios. The impact of these variables on projected radiological risk can be significant. Therefore, the model was developed as a first-order assessment tool to risk-inform decision making. Refinement of the model would be necessary if it was to be used for licensing decisions, and rigorous validation would be needed. Because site-specific waste management decisions or other variables can strongly influence whether performance objectives can be met, care should be taken not to take the model results out of the analysis context."

SECY-08-147, Enclosure 1, at page 1.[23]

3. NRC has recognized that depleted uranium is not suitable for disposal at a near-surface facility simply because it is classified as a Class A waste.

> "That the Commission has determined that DU is Class A waste merely makes that waste *eligible* for near-surface disposal. The final determination rests instead with the question of whether near-surface disposal meets the [10 CFR] Part 61, Subpart C performance objectives."

NRC's Atomic Safety and Licensing Board. [24] In addition, NRC staff concluded that it was not beneficial to change the waste classification for depleted uranium, not because it was similar to other Class A waste, but because it would not allow the same amount of disposal flexibility as the site-specific performance assessments preferred by Staff:

> "The primary disadvantage of Option 3 [reclassifying depleted uranium] is that the concentration limit developed could be so low for a reference site that it would unnecessarily constrain disposal options at sites with significantly different characteristics (e.g., humid vs. arid). As such, this approach would be prescriptive rather than a risk-informed approach, which would take into account the performance of the waste in a specific disposal environment. Another drawback to Option 3 is that it propagates the existing waste classification system, which was developed using often conservative assumptions based on the environment for LLW at the time the Part 61 FEIS was developed; some of these assumptions are not necessarily applicable in today's environment of limited disposal options and improved performance assessment capabilities."

NRC, SECY-08-0147, at page 9.[25]

C. Adequacy of current federal regulations.

1. As described elsewhere in this Statement of Basis, NRC has concluded both that its regulations should be changed, and that until its regulations are changed, additional analysis should be conducted on a site-specific basis before depleted uranium is accepted. These decisions constitute a recognition by NRC of the inadequacy of its current regulations.

2. NRC comment:

> "Why is it necessary to update the regulations?"
>
> "The licensing of new uranium enrichment facilities in the United States has raised depleted uranium to the forefront of low-level radioactive waste disposal issues. The depleted uranium waste stream is unique amongst LLRW streams; the relatively high concentrations and large quantities of depleted uranium that are generated by enrichment facilities were not considered in the Final Environmental Impact Statement (NUREG-0945) supporting the development of 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste." When NUREG-0945 was issued in 1982, there were no commercial facilities generating significant amounts of depleted uranium waste streams, therefore, NUREG-0945 considered only types of uranium-bearing waste streams being typically disposed of by U.S. Nuclear Regulatory Commission (NRC) licensees at that time."
>
> "With the existing U.S. Department of Energy enrichment facilities, and the recent NRC licensing of commercial enrichment facilities, more than one million metric tons of depleted uranium will require a disposition path. Existing disposal facilities such as the EnergySolutions' facility in Clive, Utah and the Waste Control Specialists' facility in Andrews County, Texas, have expressed interest to their Agreement State regulators in disposing of depleted uranium at their sites."
>
> "The NRC recognizes that the analysis supporting regulations in 10 CFR Part 61 did not address the disposal of significant quantities of depleted uranium, and that there may be a need to place additional restrictions at a specific site or deny such disposal based on unique site characteristics. Therefore, the NRC will update the regulations to specify a requirement for a site-specific analysis that demonstrates unique waste streams, including significant quantities of depleted uranium, can be disposed of safely."

NRC's Frequently Asked Questions about Land Disposal of Unique Waste Streams.[26]

3. David Esh, lead modeler for preparation of SECY-08-0147:

> "As part of that EIS developmental analyses, they developed a waste classification system, and that was developed by doing intruder and various scenario analyses and basically doing an inverse calculation.
>
> So they did the analyses. They set a dose limit that they were trying to achieve, and then they did a backwards calculation to determine what concentrations would give me those impacts. And that's what you see in the table values that are in the regulations right now.

So where we are now, if we have a waste stream that's a lot different or could be a lot different than what was analyzed. Then you have to say, well, I don't have table values for that. So what do I need to do about it?

And our opinion is we need to change the regulations and insure you could either develop new table values or you could insure that they do the analysis, but somebody has to do the analysis. You can't have an unanalyzed situation basically."[27]

D. Quantities of depleted uranium.

In the absence of action by the Board, it is very likely that significant quantities of depleted uranium will be disposed of at EnergySolutions before the performance assessment recommended by NRC (as discussed in II.A of this Statement of Basis) is reviewed and approved.

1. Texas and Washington have indicated they are not allowing disposal of significant quantities of depleted uranium until completion of new performance assessments, and those have not been initiated. *See* I.D of this Statement of Basis.

2. Only EnergySolutions and Barnwell will currently accept depleted uranium for disposal. Barnwell is only available for disposal of waste within its compact.[28]

3. The amounts of depleted uranium awaiting disposal are significant:

   "DOE has said they will need to begin disposal shipments for the DUF6 facilities in mid 2010. More than one million metric tons of depleted uranium will need to be disposed of over the next several years."[29]

4. Louisiana Energy Services (LES), a uranium enrichment facility licensed in June 2006, has identified a "private near-surface disposal facility" as its preferred method for disposal of the significant quantities of depleted uranium it will create; LES offered an analysis of impacts at EnergySolutions (then Envirocare) in support of its NRC license application.[30]

5. Department of Energy depleted uranium

   DOE's depleted uranium management policy requires disposal of depleted uranium it owns at one of its own disposal facilities or, with a waiver, allows disposal at a non-DOE facility. DOE has issued a waiver with respect to disposal of depleted uranium at EnergySolutions.[31]

6. EnergySolutions has acknowledged before this Board that it is marketing depleted uranium disposal and that it projects receiving significant quantities.

   "Tom Magete [*sic* - Magette, with EnergySolutions] responded that EnergySolutions did have contracts with DOE, but they did not have active task orders. EnergySolutions had

the potential of disposing of waste from the Savannah River within the next year (about 10,000 tons). The next five years, he projected 46,000 tons coming from Portsmouth and Paducah."

Utah Radiation Control Board minutes, July 2009.[32]

E. Performance period

NRC makes the following recommendation regarding the time period for performance assessments:

"Considering the technical aspects of the problem, the performance assessment staff recommends a performance period of 10,000 years for the analysis of DU disposal. However, analyses should be performed to peak impact, and if those impacts are significantly larger than the impacts realized within 10,000 years, then the longer term impacts should be included in the site environmental evaluation."

NRC, SECY-08-0147.[33]

III. IMPACTS OF RULEMAKING

The Utah Administrative Rulemaking Act, at Utah Code Ann. § 63G-3-301, requires an agency proposing rules to consider the potential impact of the rule on business and on government.

A. Impacts to business

If the rule is promulgated, one Utah business – EnergySolutions, L.L.C. – will be unable to dispose of depleted uranium until it has submitted a performance assessment and the performance assessment has been approved. The financial impacts on EnergySolutions are potentially substantial, but are difficult for the Board to specify because the impact depends on the following information not known to the Board at this time:

- When the requirement takes effect;
- When EnergySolutions will submit a performance assessment and when it is approved;
- When EnergySolutions would otherwise have received shipments of depleted uranium for disposal; and
- Whether receipts by EnergySolutions would simply be delayed, or whether there are competitors for depleted uranium disposal space such that EnergySolutions could lose reciepts altogether.[**]

[**] This rulemaking analysis does not consider the impact of any potential inability by EnergySolutions to demonstrate that it meets the requirements of 10 CFR Part 61 and the equivalent Utah rules, since that inability would not be by operation of this rule.

EnergySolutions will also bear the cost of preparing and submitting a performance assessment, but has indicated this is an action it was already taking.

No small business in Utah will be directly impacted. The only potential sources of substantial quantities of depleted uranium for disposal – the United States Department of Energy and privately-held uranium enrichment facilities – are not small businesses and are not located in Utah.

Any affected business is invited to submit information about potential costs of this proposed rule during the public comment period.

B. Impacts on government budget

The State of Utah receives fees from facilities that dispose of depleted uranium at a land disposal facility. Utah Code Ann. § 19-3-104. EnergySolutions has such a land disposal facility and has stated that it would, in the absence of this rule, seek to dispose of depleted uranium. The financial impacts of this on the state's budget are potentially substantial, particularly for FY 2010, but as described above are difficult to specify. The State of Utah receives $0.15/cubic foot of waste disposed of, plus $1 per curie.

IV. ADDITIONAL DOCUMENTATION

The documents cited in this Statement of Basis are incorporated in their entirety by this reference. In addition, all documents linked through the NRC's Unique Waste Streams Rulemaking website are incorporated by reference. *See*:

http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams.html.

V. STATEMENT REGARDING UTAH CODE ANNOT. § 19-3-104(8) and (9).

The Board intends to issue a determination, after the public comment period, about whether there are "corresponding federal regulations that are not adequate to protect public health and the environment of the state."

The statute states:

> (8) (a) Except as provided in Subsection (9), the board may not adopt rules, for the purpose of the state assuming responsibilities from the United States Nuclear Regulatory Commission with respect to regulation of sources of ionizing radiation, that are more stringent than the corresponding federal regulations which address the same circumstances.
> (b) In adopting those rules, the board may incorporate corresponding federal regulations by reference.

(9) (a) The board may adopt rules more stringent than corresponding federal regulations for the purpose described in Subsection (8) only if it makes a written finding after public comment and hearing and based on evidence in the record that corresponding federal regulations are not adequate to protect public health and the environment of the state.
(b) Those findings shall be accompanied by an opinion referring to and evaluating the public health and environmental information and studies contained in the record which form the basis for the board's conclusion.

VI. PROPOSED RULE

R313-12-3. Definitions. [No change proposed; included only for context.]

"Depleted uranium" means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.

R313-25-8. Technical Analyses.

(1) The specific technical information shall also include the following analyses needed to demonstrate that the performance objectives of R313-25 will be met:
~~(1)~~ (a) Analyses demonstrating that the general population will be protected from releases of radioactivity shall consider the pathways of air, soil, ground water, surface water, plant uptake, and exhumation by burrowing animals. 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. 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.
~~(2)~~(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.
~~(3)~~(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.
~~(4)~~(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.

(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.

(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 R. 313-25-8(2)(a).

(c) For purposes of this R. 313-25-8(2) only, depleted uranium means waste with depleted uranium concentrations greater than 5 percent by weight.

ENDNOTES

1. The following frequently cited documents in this Statement of Basis may be found at the indicated web locations.

Records

NRC Communication Plan Key Messages (August 19, 2009): http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams/key-messages.html

NRC Fact Sheet on Depleted Uranium and Other Waste Disposal (August 26, 2009): http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-du-other-waste-disposal.html

NRC's Frequently Asked Questions about Land Disposal of Unique Waste Streams (August 4, 2009): http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams/faq.html

NRC Frequently Asked Questions in the Communication Plan (August 19, 2009): http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams/workshop-faq.html

NRC Staff Requirements, SECY-08-0147, Response to Commission Order CLI-05-20 Regarding Depleted Uranium (October 7, 2008) (hereinafter SECY-08-0147): http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2008/secy2008-0147/2008-0147scy.pdf

NRC's Unique Waste Streams Rulemaking Record, Workshop 1, Day 1 Transcripts (September 2, 2009): http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams/workshop-1-transcripts-day1.pdf

NRC's Unique Waste Streams Rulemaking Record, Workshop 2, Day 1 Transcripts (September 23, 2009): http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams/workshop-2-transcripts-day1.pdf

NRC's Unique Waste Streams Rulemaking Record, Workshop Presentations (September 2009): http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams/du-workshop-presentations.pdf

NRC's Unique Waste Streams Rulemaking Record Website (October 20, 2009): http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams.html

Rules and Statutes

NRC Rules, 10 CFR Part 61: http://www.nrc.gov/reading-rm/doc-collections/cfr/part061/

DRC Rules, Utah Admin. Code R.313: http://www.rules.utah.gov/publicat/code/r313/r313.htm

DRC Statute, Radiation Control Act, Utah Code Ann. Title 19, Chapter 3: http://le.utah.gov/~code/TITLE19/19_03.htm

2. SECY-08-0147, Enclosure 1 at pages 2-3; see also chart at page 3.

The NRC also has descriptions of depleted uranium at a number of other web locations, *e.g.*, "NRC Fact Sheet on Depleted Uranium and Other Waste Disposal," and "NRC Frequently Asked Questions in the Communication Plan."

See also NRC's Unique Waste Streams Rulemaking Record, Workshop Presentations, Slide 78 of 115 and comment by David Esh, NRC's lead modeler for SECY-08-0147:

> "So we call it depleted uranium because it's depleted in the U-235 isotope, but chemically it's really concentrated uranium because you've made pure uranium out of the process of trying to develop fuel for reactors."

NRC's Unique Waste Streams Rulemaking Record, Workshop 2, Day 1 Transcript at page 92.

3. U.S. Nuclear Regulatory Commission (NRC). 'Draft Environmental Impact Statement on 10 CFR Part 61 Licensing Requirements for Land Disposal of Radioactive Waste.' NUREG-0782 (1981); NRC, 'Final Environmental Impact Statement on 10 CFR Part 61 Licensing Requirements for Land Disposal of Radioactive Waste,' NUREG-0945 (1982).

Note also NRC's statement that "Waste class concentrations [are] based primarily on inadvertent intruder exposure." NRC's Unique Waste Streams Rulemaking Record, Workshop Presentations, Slide 33 of 115.

4. "A Performance Assessment Methodology for Low-Level Radioactive Waste Disposal Facilities: Recommendations of NRC's Performance Assessment Working Group," NUREG-1573. Note that among the many recommendations made by the authors of this document are a recommendation for a time period of 10,000 years for analyzing performance (*Id.* at 3-13), and a recommendation for "refraining from excessive speculation about the extremely distant future, and . . . limiting evaluations of the natural site's geologic evolution to the next 10,000 years," based, for example, on the assumption that geological changes such as glaciation will result in conditions under which humans will not be living close enough to the waste to be exposed. *Id.* at 3-9 and 3-10.

Web access through: http://www.nrc.gov/reading-rm/doc-collections/nuregs/pubs/.

5. In the Matter of Louisiana Energy Services (National Enrichment Facility), 62 NRC 523, CLI-05-20, October 19, 2005.

   Web access: http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2005/2005-20cli.html.

6. *See* NRC website, Louisiana Energy Services (LES) Gas Centrifuge Facility.

   Web access: http://www.nrc.gov/materials/fuel-cycle-fac/lesfacility.html.

7. In the Matter of Louisiana Energy Services (National Enrichment Facility), 63 NRC 687 at 690, CLI-06-15, June 2, 2006.

   Web access: http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2006/2006-15cli.pdf

8. *Id.*

9. *Id.*,, at 699. *See also* In the Matter of Louisiana Energy Services (National Enrichment Facility), 63 NRC 241, ASLBP 04-826-01-ML, LPB-06-08, March 3, 2006; and In the Matter of Louisiana Energy Services (National Enrichment Facility), 63 NRC 687, CLI-06-15, June 2, 2006 and Environmental Impact Statement for the Proposed National Enrichment Facility in Lea County, New Mexico (NUREG-1790).

   Web access for EIS: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1790/

10. *See* SECY-08-0147.

11. *See* Commission Order in Memorandum re: Staff Requirements – SECY-08-0147 – Response to Commission Order CLI-05-20 Regarding Depleted Uranium.

    Web access: http://www.nrc.gov/reading-rm/doc-collections/commission/srm/2008/2008-0147srm.pdf.

12. See NRC Communication Plan Key Messages, and NRC Frequently Asked Questions in the Communication Plan.

13. All references in this section are to Envirocare and EnergySolutions' license amendments and related submissions for the dates given; license amendments and related submissions are in Division of Radiation Control files. The information in numbers 1 through 3 is also described in an analysis by the U.S. Department of Energy. *See* Evaluation of the Acceptability of Potential Depleted Uranium Hexafluoride Conversion Products at the Envirocare Disposal Site, ORNL/TM-2000/355, December 2000.

Web access: http://www.ornl.gov/~webworks/cpr/rpt/109279_.pdf.

14. NRC's Unique Waste Streams Rulemaking Record, Workshop 2, Day 1 Transcript at page 55.

15. *Id.*

16. Texas Admin. Code, Rule § 336.709.

    Web access: http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=2&p_dir=N&p_rloc=106855&p_tloc=&p_ploc=1&pg=41&p_tac=106856&ti=30&pt=1&ch=336&rl=709&z_chk=1072573.

17. NRC's "Frequently Asked Questions in the Communication Plan." *See also* Communication Plan Key Messages.

18. NRC's Unique Waste Streams Rulemaking Record, Workshop 2, Day 1 Transcript at page 40.

19. *See, e.g.,* SECY-08-0147, at page 5.

20. *See* SECY-08-0147, Enclosure 1 at page 4.

    See also comment made by David Esh, NRC's lead modeler for SECY-08-0147:

    > "Basically the large quantities were not evaluated in EIS [the document supporting rulemaking for Part 61]. They did something like 17 Curies of Uranium-238 and three Curies of Uranium 235, and something like a million cubic meters of waste in the analyses, and if you look at the potential waste streams that may be anticipated, you could be looking at something like 470,000 Curies of Uranium-238. So you're really outside of the box from what was done, and we recognize that, and that's why we're here today."

    NRC's Unique Waste Streams Rulemaking Record, Workshop 2, Day 1 Transcript at page 90.

21. NRC Fact Sheet on Depleted Uranium and Other Waste Disposal. This has also been acknowledged by NRC in many other documents, e.g., NRC, SECY-08-0147, Enclosure 1 at page 1, and In the Matter of Louisiana Energy Services (National Enrichment Facility), 62 NRC 523, CLI-05-20, October 19, 2005, Part V.

    Web access for CLI-05-20: http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2005/2005-20cli.html.

22. See Workshop Presentations, slide 40 of 115.

Note that risk is a function of quantity and concentration. *Id.* at Slide 58.

23. *See* SECY-08-147, Enclosure 1, at page 1.

See also Slide 54 of 115 of the "Workshop Presentations" made by NRC at its NRC's Unique Waste Streams Rulemaking Workshop:

> "Analysis not intended to replace site-specific evaluations."

24. In the Matter of Louisiana Energy Services (National Enrichment Facility), 63 N.R.C. 591, 70-3103-ML, (ASLBP 04-826-01-ML) (May 31, 2006).

25. See SECY-08-147, at page 9.

26. NRC's Frequently Asked Questions about Land Disposal of Unique Waste Streams.

27. NRC's Unique Waste Streams Rulemaking Record, Workshop 2, Day 1 Transcript at page 82.

28. *See* NRC's Unique Waste Streams Rulemaking Record,"Workshop Presentations," Slide 12, "Commercial LLW Disposal Sites, and accompanying commentary at Workshop 1, Day 1 at page 32 and Workshop 2, Day 1 Transcript at pages 37-38.

29. NRC's Unique Waste Streams Rulemaking Record, Workshop 1, Day 1 Transcript (cited in note 1) at p. 25 and Workshop 2, Day 1 Transcript at p. 30.

30. *See* citations in notes 7 and 9.

31. *See* "U.S. Department of Energy Manual, Approval of Exemptions for Use of Non-DOE Facilities," at I-7.

Web access: https://www.directives.doe.gov/pdfs/doe/doetext/neword/435/m4351-1c1.pdf.

Representatives of the Board have been unable to locate a copy of DOE's exemption for disposal of depleted uranium at EnergySolutions or related documentation of DOE's decision to dispose of its depleted uranium in Utah, but the need for an exemption is also referenced in two pre-decisional documents: "Evaluation of the Acceptability of Potential Depleted Uranium Hexafluoride Conversion Products at the Envirocare Disposal Site," December 2000; and "Draft Supplement Analysis for Location(s) to Dispose of Depleted Uranium Oxide Conversion Product Generated from DOE's Inventory of Depleted Uranium Hexafluoride (DOE/EIS-0359-SA1 AND DOE/EIS-0360-SA1), March 2007."

Web access (respectively): http://www.ornl.gov/~webworks/cpr/rpt/109279 .pdf

and http://gc.energy.gov/NEPA/nepa_documents/na/EIS-0359-SA1_EIS-0360-SA1.pdf.

32. Web access: http://www.radiationcontrol.utah.gov/Board/minagd/7142009.pdf.

33. SECY-08-0147, Enclosure 1 at page 21. *See also* SECY-08-0147, Enclosure 1 at pages 6-8 for a fuller discussion.

ATTACHMENT 4

NRC Performance Objectives for
Land Disposal of Radioactive Waste
10 CFR Subpart C

NRC PERFORMANCE OBJECTIVES FOR
LAND DISPOSAL OF RADIOACTIVE WASTE
10 CFR Subpart C

§ 61.40 General requirement.
Land disposal facilities must be sited, designed, operated, closed, and controlled after closure so that reasonable assurance exists that exposures to humans are within the limits established in the performance objectives in §§ 61.41 through 61.44.

§ 61.41 Protection of the general population from releases of radioactivity.
Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

§ 61.42 Protection of individuals from inadvertent intrusion.
Design, operation, and closure of the land disposal facility must ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste at any time after active institutional controls over the disposal site are removed.

§ 61.43 Protection of individuals during operations.
Operations at the land disposal facility must be conducted in compliance with the standards for radiation protection set out in part 20 of this chapter, except for releases of radioactivity in effluents from the land disposal facility, which shall be governed by § 61.41 of this part. Every reasonable effort shall be made to maintain radiation exposures as low as is reasonably achievable.

§ 61.44 Stability of the disposal site after closure.
The disposal facility must be sited, designed, used, operated, and closed to achieve long-term stability of the disposal site and to eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure so that only surveillance, monitoring, or minor custodial care are required.

ATTACHMENT 5

Draft Findings and Opinion Regarding Adequacy of Corresponding Federal Regulations
Under Utah Code Ann. § 19-3-104(9)

[Draft] Findings and Opinion of the Utah Radiation Control Board Regarding Adequacy of Corresponding Federal Regulations Under Utah Code Ann. § 19-3-104(9)

Finding

The Board does not consider the Proposed Rule to be more stringent than corresponding federal rules, as described in the Comment Response document, Part C. In the event that determination is not accepted, however, and in particular in the event it is determined that the agency lacks authority to require a licensee to demonstrate through an approved performance assessment that NRC Performance Objectives will be met prior to receipt and disposal of depleted uranium, the Board finds that corresponding federal regulations are not adequate to protect public health and the environment of Utah. Disposal of depleted uranium for a performance period of 10,000 years or more is an unanalyzed condition and, in the absence of a performance assessment, the impacts of that disposal will not be adequately analyzed to ensure that public health and safety will be protected.

Opinion

The analyses in the Utah Radiation Control Board's Statement of Basis for Administrative Rulemaking Regarding Disposal of Significant Quantities of Depleted Uranium (December 1, 2009) and in the Executive Secretary's Response to Comments Regarding Proposed Amendments to Utah Admin. Code R313-25-8 to Address Depleted Uranium (March 5, 2010) are hereby adopted by the Board and constitute the opinion required by Utah Code Ann. § 19-3-104(9)(b).

Approved by the Utah Radiation Control Board

_____ _____

Peter C. Jenkins, Chair Date

ATTACHMENT 6

Email from Assistant Attorney General, Laura Lockhart
To EnergySolutions' Attorney, Craig Galli
December 2, 2009

From: Laura Lockhart
To: Galli, Craig; Thomas, Christopher
Date: 12/2/2009 2:15 PM
Attachments: Basis for rulemaking - final proposed.pdf

Craig Galli & Christopher Thomas,

Attached FYI is the Statement of Basis that will be considered by the Board. It is going out with the Board packet today.

Laura Lockhart

V. Radioactive Waste Disposal

c. Recommendations from the Radiation Control Board Subcommittee: Waste Blending (Board Action Item)

From: Pat Cone <pat.cone@browning.com>
To: Dane Finerfrock <dfinerfrock@utah.gov>
CC: Yolanda Necochea <ynecochea@utah.gov>
Date: 3/31/2010 8:46 AM
Subject: <no subject>
Attachments: Report to the Utah Radiation Control Board (1).doc

Dane.

Here is the recommendation from the blending subcommittee, for dispersion to the board.

Report to the Utah Radiation Control Board

From the Downblending Subcommittee

March 24, 2010

The Downblending Subcommittee met on March 15th to put forth recommendations to the Board on two subjects for the April 13, 2010 meeting:

1-Downblending of radioactive waste.

2- A comprehensive rule for unique waste streams.

After reading and discussion, the Subcommittee makes these 3 recommendations to the Board:

1-The Board should issue a position statement opposing the downblending of radioactive waste.

2-Issue a policy that encourages the maintenance of waste classification system integrity.

3-Intiate rulemaking for procedure to require Site Specific Performance Assessments.

Since the NRC is addressing the downblending issue at present, the Subcommittee also concluded that rulemaking to prohibit the downblending of waste is still considered as an option in the future.

The recommendations are included below.

Patrick Cone

Chair-Downblending Subcommittee

Utah Radiation Control Board

UTAH RADIATION CONTROL BOARD
POSITION STATEMENT ON DOWN BLENDING RADIOACTIVE WASTE:

The Utah Radiation Control Board (Board) recognizes that down-blended radioactive waste does not pose any unique health and safety issues to the public that are not observed in other classes of low level radioactive waste. The Board also is aware that down blending may appear to some as a process to circumvent Utah law, which prohibits any entity in Utah from accepting Class B or Class C low-level radioactive waste for commercial storage, treatment or disposal. Utah Code Ann. § 19-3-103.7.. However, in order to maintain public confidence in the regulatory process and to protect against unforeseen hazards, the Board issues the following position statements regarding down-blended radioactive waste:

1. The Board is opposed to waste blending when the intent is to alter the waste classification for the purposes of disposal site access.
2. Dilution of radioactive wastes with uncontaminated materials should be explicitly prohibited.
3. Current guidance documents dealing with concentration averaging and mixing should be updated to address the current understanding of the possible down-blending issues. Important matters dealing with waste blending, such as prohibition of certain practices, currently in guidance should be put into regulation.

10 CFR Part 20, Appendix G, Subpart I (C)(12), states that classification is required for wastes consigned to a disposal site. The NRC should expand this rule to explicitly specify who has the obligation to classify wastes and when.

UTAH RADIATION CONTROL BOARD
POLICY MAINTAINING WASTE CLASSIFICATION SYSTEM INTEGRITY

It is the policy of the Utah Radiation Control Board that the radioactive waste classification system be maintained, and that activities of licensees be consistent with maintaining radioactive waste classification categories. As changes in the classification are proposed, activities of licensees should remain consistent with promulgated classification rules.

UTAH RADIATION CONTROL BOARD
RULE FOR A SITE-SPECIFIC PERFORMANCE ASSESSMENT

RECOMMENDATION:

1. A site-specific performance assessment shall be performed prior to accepting any radioactive waste when:
   a. Required by the Executive Secretary; and/or
   b. Required by the Board; or
   c. Classification of the waste is not specifically defined by regulation or by established guidance that is directly applicable to the waste in question
2. A site-specific performance assessment shall:
   a. Be performed in the context of the entire site radionuclide inventory of the radionuclide(s) in question;
   b. Evaluate the site-specific appropriateness at the time of maximum hazard, taking into account the performance objectives in R313-25; and
   c. Demonstrate that the facility is as least as likely as not to be able to meet these performance objectives.

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R313-25-8. Technical Analyses.

1. A site-specific performance assessment shall be performed prior to accepting any radioactive waste when:

a. Required by the Executive Secretary;

b. Required by the Board; or

c. Classification of the waste is not specifically defined by regulation or by established guidance that is directly applicable to the waste in question.

2. A site-specific performance assessment shall:

a. Be performed in the context of the entire site radionuclide inventory of the radionuclide(s) in question;

b. Evaluate the site-specific appropriateness at the time of maximum hazard, taking into account the performance objectives in R313-25; and

c. demonstrate that the facility is as least as likely as not to be able to meet performance objectives.

3. The specific technical information required in R313-25-7 shall also include the following analyses needed to demonstrate that the performance objectives of R313-25 will be met:

~~1.~~ (a) Analyses demonstrating that the general population will be protected from releases of radioactivity shall consider the pathways of air, soil, ground water, surface water, plant uptake, and exhumation by burrowing animals. 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. 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.

~~2.~~ (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.

~~3.~~ (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.

~~4.~~ (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.

VII. Other Division Issues (Board Information Item)

a. Division of Radiation Control Quarterly Activities Report

State of Utah

GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF RADIATION CONTROL
Dane L. Finerfrock
Director

Division of Radiation Control
Activities Report Summary

March, 2010 Violations assigned a Severity Level I. II or III or where a Monetary Penalty has been imposed.

N/A

1st Quarter, 2010

X-Ray Program

Current Registrations: 2566, an increase of 9 registrants since last quarter.
Inspections conducted: 199
Inspections conducted by Qualified Experts: 34

Radioactive Materials Program

Current Licensees: 198, representing 184 licensees, an increase of 3 licenses and 3 licensees.
Radioactive materials inspections: 23
Three new licenses were issued, 15 licenses were renewed and 20 license amendments were completed.

Low-Level Radioactive Waste Program

Five inspections were conducted at EnergySolutions in the following areas: 4- materials, equipment and conveyance release and 1-general radiation safety inspections. Also, the Division sampled 171 "depleted uranium" drums at EnergySolutions

Uranium Mill Program

Four inspections were conducted at the uranium mills including: 2-Denison Mines, 1- Uranium One and 1- Rio Algom.

Generator Site Access Permit

168 manifests were audited and 817 on-site shipment inspections were performed.

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