



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF RADIATION CONTROL
Rusty Lundberg
Director

May 12, 2014

DRC-2014-003161

Daniel B. Shrum
Senior Vice President
Regulatory Affairs
EnergySolutions, LLC
423 West 300 South, Suite 200
Salt Lake City, UT 84101

SUBJECT: License Amendment No. 16: Radioactive Material License UT 2300249

Dear Mr. Shrum:

Enclosed is a copy of Amendment No. 16 to Radioactive Material License (RML) UT 2300249. License Amendment 16 incorporates minor changes and revisions to License Conditions 4, 22, 31, 32E, 43, 73A iii and iv, 73B, and 76.

License Amendment No.16 also incorporates major changes and revisions to License Conditions 22, 39E and 77. A thirty-day public comment period was held for Amendment No. 16 and a Public Participation Summary document has been prepared. The Public Participation Summary documents the comments received and the Utah Division of Radiation Control's responses to the comments received. Please find the signed Amendment No. 16 and a copy of the Public Participation Summary document enclosed.

If you have any questions or concerns regarding the amendment, please contact John Hultquist at (801) 536-4250.

Sincerely,

Rusty Lundberg, Director

RL/RJ:rj
Enclosures

LICENSE AMENDMENT

**UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
 DIVISION OF RADIATION CONTROL
 RADIOACTIVE MATERIAL LICENSE**

Pursuant to Utah Code Ann. Title 19, Chapter 3 and the Radiation Control Rules, Utah Administrative Code R313, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material designated below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This licensee is subject to all applicable rules, and orders now or hereafter in effect and to any conditions specified below.

 LICENSEE) 3. License Number UT 2300249
) Amendment # 16
 1. Name: EnergySolutions, LLC (EnergySolutions))*****
) 4. Expiration Date
 2. Address: 423 West 300 South) January 25, 2013
 Suite 200) (under timely renewal)
 Salt Lake City, UT 84101)*****
) License Category – 4-a

6. Radioactive material (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity licensee may possess at any one time
A. Any Radioactive Material including Special Nuclear Material specified in License Condition 13 A through J.	A. Notwithstanding Conditions 9 (Authorized Use), 16 (Prohibitions and Waste Requirements), and 56 (containerized waste), typically large volume, bulky or containerized, soil or debris. Debris can include both decommissioning (cleanup) and routinely generated operational waste including but not limited to radiologically contaminated paper, piping, rocks, glass, metal, concrete, wood, bricks, resins, sludge, tailings, slag, residues, personal protective equipment (PPE) that conforms to the size limitations in currently approved QA/QC Manual.	A. 20,000 Curies***
B. Special Nuclear Material	B. See 7.A of this license	B. As specified in License Condition 13.A through J.

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6.	Radioactive material (element and mass number)	7.	Chemical and/or physical form	8.	Maximum quantity licensee may possess at any one time
					(1,000 Ci) total except as specified by Condition 15
C.	Cesium-137	C.	Sealed Source(s) registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation	C.	Not to exceed 11 millicuries per source; Not to exceed 6 sources total
D.	Americium-241	D.	Sealed Neutron Source(s) registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation	D.	Not to exceed 51 millicuries per source; Not to exceed 6 sources total.
E.	Americium-241 Americium-243 Neptunium-237 Plutonium-236 Plutonium-239 Plutonium-242 Thorium-229 Thorium-230 Uranium-232 Uranium-238 Curium-244 Hydrogen-3 Carbon-14 Iron-55 Nickel-59 Nickel-63 Technetium-99	E.	Liquid	E.	Not to exceed 5 microcuries total activity per isotope; Not to exceed 16 sources total.
F.	Strontium-90/Yttrium-90	F.	Liquid	F.	Not to exceed 5 microcuries total activity
G.	Americium-241	G.	Sealed Source(s) registered pursuant to R313-22-210 or an	G.	Not to exceed 5 microcuries total

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6.	Radioactive material (element and mass number)	7.	Chemical and/or physical form	8.	Maximum quantity licensee may possess at any one time
			equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation		activity
H.	Thorium-230	H.	Sealed Source(s) registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation	H.	Not to exceed 48.6 microcuries total activity
I.	Plutonium-239	I.	Sealed Source(s) registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation	I.	Not to exceed 21.9 microcuries total activity
J.	Strontium-90/Yttrium-90 and Americium-241	J.	Sealed Source(s) registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation	J.	Not to exceed 8.1 millicuries per source; Not to exceed 6 sources total.
K.	Am-241, Cd-109, Co-57, Te-123m, Cr-51, Sn-113; Sr-85, Cs-137, Co-60, Y-88, Th-230, Na-22, Mn-54, Eu-155 and Pb-210	K.	Calibration or Reference Source(s)	K.	Not to exceed 5 microcuries per isotope; Not to exceed 25 sources total.
L.	Uranium-234, Uranium-235, Uranium-238, Americium-241, and Plutonium-239	L.	Calibration or Reference Source(s)	L.	Not to exceed 20 nanocuries per isotope
M.	Cobalt-60 and Cesium-137	M.	Calibration or Reference Combined Source(s)	M.	Not to exceed 0.4 microcuries per source; Not to exceed 6 sources total.
N.	Reserved	N.	Reserved	N.	Reserved
O.	Americium-241 and Europium-152	O.	Calibration or Reference Combined Sources	O.	Not to exceed 2 microcuries per source; Not to exceed 4 sources total.

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6.	Radioactive material (element and mass number)	7.	Chemical and/or physical form	8.	Maximum quantity licensee may possess at any one time
P.	Cesium-137	P.	Sealed Source(s) registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation	P.	Not to exceed 12 millicuries per source; Not to exceed 3 sources total.

***Applies to undisposed maximum quantity at the Class A West disposal cell and the Mixed Waste landfill cell.

9. AUTHORIZED USE

- A. Licensee may receive, store, and dispose by land burial, radioactive material as naturally occurring and accelerator produced material (NARM) and low-level radioactive waste. Prior to receiving an initial, low-level radioactive waste shipment for disposal from a generator, the Licensee shall obtain documentation which demonstrates that the low-level radioactive wastes have been approved for export to the Licensee. Approval is required from the low-level radioactive waste compact of origin (including the Northwest Compact), or for states unaffiliated with a low-level radioactive waste compact, the state of origin, to the extent a state can exercise such approval.
- B. In accordance with Utah Code Annotated 19-3-105, the Licensee may not receive Class B or Class C low-level radioactive waste without first receiving approval from the Director of the Utah Division of Radiation Control (Director) and also receiving approval from the Governor and the Legislature.
- C. The Licensee shall fulfill and maintain compliance with all conditions and shall meet all compliance schedules stipulated in the Ground Water Quality Discharge Permit, number UGW 450005 (hereafter GWQ Permit), issued by the Director of the Utah Division of Radiation Control.
- D. The Licensee may receive and store up to twenty (20) empty radioactive waste transportation casks under the following conditions:
 - The casks are dedicated to the transportation of low level radioactive wastes.
 - Storage of the casks is confined to the Restricted Area within the area specified in License Condition 10, except when staged for return to commerce within 7 days.
 - Internal contamination is kept minimal as practical but will not exceed the contamination limits specified for Department of Transportation, Class 7 Hazardous Material, Radioactive Material, Excepted Package-Empty Packaging, UN2908.
 - During storage, casks are to be secured in accordance with their Department of

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Transportation or Nuclear Regulatory Commission approved design specifications.

- E. The Licensee may dispose of a volume of Class A Low-Level Radioactive Waste (LLRW) and Naturally Occurring and Accelerator Produced Radioactive Materials (NARM) in the Class A West disposal cell described in License Condition 40 not exceeding 8,724,097 cubic yards, and in the Mixed Waste Landfill Cell not exceeding 1,354,092 cubic yards. Together, the total aggregate volume of waste disposed of in the Class A West disposal cell and the Mixed Waste Landfill Cell shall not exceed 10.08 million cubic yards. Class A waste LLRW is defined in Utah Radiation Control Rule R313-15-1009 and NARM at R313-12-3.
- F. Effective January 1, 2002, the Licensee shall not accept, possess, store or dispose of any radioactive waste delivered to the disposal site by any conveyance, unless the associated Shipping Documents have a valid Generator Site Access Permit number, issued by the Utah Division of Radiation Control, affixed.
- G. The Licensee may receive and treat radioactively contaminated aqueous liquids and liquid mercury as characterized in the waste profile at the mixed waste facilities only, the waste must be Class A LLRW at receipt. Treated aqueous liquids may be disposed at the Mixed Waste Facility or the LLRW Facility, in accordance with Exhibit 3 of the Waste Characterization Plan. Treated (amalgamated) liquid mercury shall be disposed at the Mixed Waste Facility only.
- H. Reserved
- I. Licensed material in Items 6.C and 6.D, sealed source(s) contained in compatible portable gauging devices (registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation) for measuring properties of materials.
- J. Licensed material in Items 6.E through 6.O, for operational checks and efficiency determinations of radiation detection instrumentation.
- K. Reserved
- L. Licensed material in Item 6.P, sealed source(s) contained in MGP Instruments, Inc. Model IRD-2000 dosimeter calibrators/irradiators for tests and source checks of electronic dosimeters.

SITE LOCATION

- 10. A. The Licensee may receive, store and dispose of licensed material at the Licensee's facility located in Section 32 of Township 1 South and Range 11 West, Tooele County, Utah.

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- B. Section 32, Township 1 South and Range 11 West, Tooele County, Utah, is defined by the following points of reference:

Southwest Section Corner:	Latitude 40° 40' 51.890" N
	Longitude 113° 7' 28.580" W
Elevation	4269.76 feet above mean sea level (amsl)
Southeast Section Corner	Latitude 40° 40' 51.879" N
	Longitude 113° 6' 20.011" W
Elevation	4277.27 feet-amsl
Northwest Section Corner	Latitude 40° 41' 44.098" N
	Longitude 113° 7' 28.654" W
Elevation	4273.06 feet-amsl
Northeast Section Corner	Latitude 40° 41' 44.086" N
	Longitude 113° 6' 20.109" W
Elevation	4280.83 feet-amsl

- C. The Southwest Section Corner marker of Section 32 shall be the Point of Beginning (POB).
- D. The Licensee shall cause a survey to be conducted by a Utah licensed land surveyor to identify the section corners of Section 32, Township 1 South, and Range 11 West, Tooele County, Utah (as defined in Condition 10.B). Licensee shall place monuments with brass caps at the identified section corner locations. Monuments shall be permanent and constructed in a manner that will protect them from being disturbed.
- E. Authorized Use of Sealed Sources
- i. Licensed material in Items 6.C and 6.D used as authorized in 9.I, and licensed materials in Items 6.E through 6.P used as authorized in 9.J and identified as sealed sources may be used and stored on all property owned by the Licensee at their Clive facility. The property is located in Sections 29, 32 and in parts of Sections 28 and 33 in Township 1 South, Range 11 West and parts of Sections 4, 5 and 6 in Township 2 South, Range 11 West SLBM, Tooele County, Utah.
 - ii. Licensed material not authorized for use specified in License Conditions 9.I and 9.J or not defined as sealed sources in License Condition 9.J shall be used and stored only at the Licensee's facilities referenced in Condition 10.B.
11. The open cell area within the Class A West disposal embankment, where waste disposal/placement has occurred or may occur, but the cover system has not been completed shall be limited to 3,650,000 square feet. Uncovered radioactive waste shall be limited to a surface area of 1,020,000 square feet.

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12. Pursuant to UAC R313-12-55(1), the Licensee is granted an exemption to UAC R313-25-9, as it relates to land ownership and assumption of ownership.

SPECIAL NUCLEAR MATERIAL

- 13 In accordance with the Order issued by the U.S. Nuclear Regulatory Commission dated January 14, 2003, Docket No. 040-8989, License No. SMC-1559, EnergySolutions may possess Special Nuclear Material (SNM) within the restricted area of the EnergySolutions facility as described in Condition 10 provided that:

- A. Concentrations of SNM in individual waste containers must not exceed the values listed in Table 13-A at time of receipt:

Table 13-A

<u>Column 1</u> Radionuclide	<u>Column 2</u> Maximum Concentration (pCi/g)	<u>Column 3</u> Measurement Uncertainty (pCi/g)
U-235 ^a	1,900	285
U-235 ^b	1,190	179
U-235 ^c	26	10
U-235 ^d	680	102
U-233	75,000	11,250
Pu-236	500	75
Pu-238	10,000	1,500
Pu-239	10,000	1,500
Pu-240	10,000	1,500
Pu-241	350,000	50,000
Pu-242	10,000	1,500
Pu-243	500	75
Pu-244	500	75

a - for uranium below 10 percent enrichment and a maximum of 20 percent of the weight of the waste of materials listed in License Condition 13.B

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- b - for uranium at or above 10 percent enrichment and a maximum of 20 percent of the weight of the waste of materials listed in License Condition 13.B
- c - for uranium at any enrichment with unlimited quantities of materials listed in License Condition 13.B and License Condition 13.C
- d - for uranium at any enrichment with sum of materials listed in License Condition 13.B and License Condition 13.C not exceeding 45 percent of the weight of the waste

* The measurement uncertainty values in Column 3 above represent the maximum one-sigma uncertainty associated with the measurement of the concentration of the particular radionuclide.

The SNM must be homogeneously distributed throughout the waste. If the SNM is not homogeneously distributed, then the limiting concentrations must not be exceeded on average in any contiguous mass of 600 kilograms.

- B. Except as allowed by notes a, b, c, and d in Condition 13.A, waste must not contain "pure forms" of chemicals containing carbon, fluorine, magnesium, or bismuth in bulk quantities (e.g., a pallet of drums, a B-25 box). By "pure forms," it is meant that mixtures of the above elements such as magnesium oxide, magnesium carbonate, magnesium fluoride, bismuth oxide, etc. do not contain other elements. These chemicals would be added to the waste stream during processing, such as at fuel facilities or treatment such as at mixed waste treatment facilities. The presence of the above materials will be determined by the generator, based on process knowledge or testing.
- C. Except as allowed by notes c and d in Condition 13.A, waste accepted must not contain total quantities of beryllium, hydrogenous material enriched in deuterium, or graphite above one percent of the total weight of the waste. The presence of the above materials will be determined by the generator, based on process knowledge, physical observations, or testing.
- D. Waste packages must not contain highly water soluble forms of uranium greater than 350 grams of uranium-235 or 200 grams of uranium-233. The sum of the fractions rule will apply for mixtures of U-233 and U-235. Highly soluble forms of uranium include, but are not limited to: uranium sulfate, uranyl acetate, uranyl chloride, uranyl formate, uranyl fluoride, uranyl nitrate, uranyl potassium carbonate, and uranyl sulfate. The presence of the above materials will be determined by the generator, based on process knowledge or testing.
- E. Mixed waste processing of waste containing SNM will be limited to stabilization (mixing waste with reagents), micro-encapsulation, macro-encapsulation using low-density and high density polyethylene, macroencapsulation using cementitious mix (Macro Mix), and thermal desorption.

When waste is processed using the thermal desorption process, EnergySolutions shall confirm the SNM concentration following processing and prior to returning the waste to temporary storage.

Liquid waste may be stabilized provided the SNM concentration does not exceed the SNM concentration limits in License Condition 13.A. For containers of liquid waste with more than 600

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kilograms of waste, the total activity (pCi) of SNM shall not exceed the SNM concentration in License Condition 13.A times 600 kilograms of waste. Waste containing free liquids and the solids shall be mixed prior to treatment. Any solids shall be maintained in a suspended state during transfer and treatment.

F. EnergySolutions shall require generators to provide the following information for each waste stream:

Before Receipt

1. Waste Description. The description must detail how the waste was generated, list the physical forms in the waste, and identify uranium chemical composition.
2. Waste Characterization Summary. The data must include a general description of how the waste was characterized (including the volumetric extent of the waste, and the number, location, type, and results of any analytical testing), the range of SNM concentration ranges, and the analytical results with error values used to develop the concentration ranges.
3. Uniformity Description. A description of the process by which the waste was generated showing that the spatial distribution of SNM must be uniform, or other information supporting spatial distribution.
4. Manifest Concentration. The generator must describe the methods to be used to determine the concentrations on the manifests. These methods could include direct measurement and the use of scaling factors. The generator must describe the uncertainty associated with sampling and testing used to obtain the manifest concentrations.

EnergySolutions shall review the above information and, if adequate, approve in writing this pre-shipment waste characterization and assurance plan before permitting the shipment of a waste stream. This will include statements that EnergySolutions has a written copy of all the information required above, that the characterization information is adequate and consistent with the waste description, and that the information is sufficient to demonstrate compliance with Conditions 13.F.1 through 13.F.4. Where generator process knowledge is used to demonstrate compliance with Conditions 13.A, 13.B, 13.C, or 13.D, EnergySolutions shall review this information and determine when testing is required to provide additional information in assuring compliance with the conditions. EnergySolutions shall retain this information as required by the State of Utah to permit independent review.

At Receipt

EnergySolutions shall require generators of SNM waste to provide a written certification with each waste manifest that states the SNM concentrations reported on the manifest do not exceed the limits in Condition 13.A, that the measurement uncertainty does not exceed the uncertainty value in Condition 13.A, and that the waste meets Conditions 13.B through 13.D.

- G. Sampling and radiological testing of waste containing SNM must be performed in accordance with the following: One sample for each of the first ten shipments of a waste stream; or one sample for each of the first 100 cubic yards of waste up to 1,000 cubic yards of a waste stream; and one sample for each additional 500 cubic yards of waste following the first ten shipments or following the first 1,000 cubic

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yards of a waste stream. Sampling and radiological testing of debris waste containing SNM can be waived if the SNM concentration is lower than one tenth of the applicable limit in License Condition 13.A.

- H. EnergySolutions shall notify the NRC, Region IV office within 24 hours if any of the above conditions are violated, including if a batch during a treatment process exceeds the SNM concentration in License Condition 13.A. A written notification of the event must be provided within 7 days.
- I. EnergySolutions shall obtain NRC approval prior to changing any activities associated with the above conditions.
- J. Notwithstanding License Condition 13.A through 13.I, for the Containerized Waste Facility described in License Condition 40, the following limits for possession of SNM apply to the total combined quantities of SNM at the Containerized Waste Facility:

Consistent with the definition of special nuclear material given in UAC R313-12-3, the maximum quantity of special nuclear material which the EnergySolutions may possess at any one time, shall not exceed: 350 grams of U-235, 200 grams of U-233, and 200 grams Pu, or any combination of them in accordance with the following formula:

$$\frac{(\text{Grams U-235})}{350} + \frac{(\text{Grams U-233})}{200} + \frac{(\text{Grams Pu})}{200} \leq 1$$

"Possession" and "Disposal" are defined in License Conditions 63 and 64 respectively.

MIXED WASTE

- 14. A. The Licensee may receive for treatment, storage, and disposal any radioactive waste as authorized by this license that is also determined to be hazardous (commonly referred to as mixed waste) as permitted by the "Hazardous Waste Plan Approvals" issued and modified by the Director of the Utah Division of Solid and Hazardous Waste and "HSWA Permit" issued by the U.S. Environmental Protection Agency.
- B. The Licensee may dispose of treated mixed waste in the Class A West disposal cell if it meets the criteria described in Exhibit 3 of the Waste Characterization Plan.
- C. All other mixed wastes shall be disposed in the Mixed Waste Landfill Cell only.

WASTE TREATMENT AND PROCESSING

- 15. A. Prior to receipt of any low level radioactive or mixed wastes requiring treatment before disposal, the Licensee shall, based on knowledge of the technology to be used for treatment/processing of each particular radioactive or mixed waste, calculate and document that the resultant processed waste is neither Class B nor Class C waste.

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- B Reserved
- C. Following treatment at the Mixed Waste facility the Licensee shall classify the resultant processed waste in accordance with UAC R313-15-1009.
- D. The Licensee shall manifest treated waste from the Mixed Waste facility for disposal in accordance with UAC R313-15-1006.

PROHIBITIONS AND WASTE ACCEPTANCE REQUIREMENTS

16. A. Sealed sources as defined in Utah Administrative Code (UAC) R313-12 shall not be accepted for disposal.
- B. In accordance with UAC R313-15-1009(2)(a)(v), waste shall not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.
 - C. In accordance with UAC R313-15-1009(2)(a)(vi), waste shall not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste.
 - D. In accordance with UAC R313-15-1009(2)(a)(vii), waste shall not be pyrophoric.
 - E. Waste containing untreated biological, pathogenic, or infectious material including radiologically contaminated laboratory research animals is prohibited
 - F. Liquid Waste Restrictions
 - i. Except for liquid mercury and minimal quantities as described in Condition 17 and in the Waste Characterization Plan, receipt of non-aqueous liquid waste is prohibited unless specifically approved by the Director.
 - ii. Treated liquid radioactive waste shall be disposed at the Mixed Waste Facility or the LLRW Facilities in accordance with Exhibit 3 of the Waste Characterization Plan.
 - iii. Only Utah Division of Radiation Control approved solidification or absorption agents as listed in the State-issued Part B Permit are authorized for liquid waste treatment.
 - iv. Liquid radioactive waste shall be solidified or absorbed in a manner such that no liquid component is disposed.
 - v. Only containers authorized by the U. S. Department of Transportation as specified in the regulations (49 CFR parts 100 thru 180) for transporting liquid radioactive materials shall be accepted for all liquid radioactive wastes, regardless of radioactivity concentrations.
 - G. In accordance with UAC R313-15-1009(2)(a)(viii), gaseous waste received for disposal in the Containerized Waste Facility shall be packaged at an absolute pressure that does not exceed 1.5 atmospheres at a temperature of 20 degrees Celsius and the total activity of any container shall not

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exceed 100 curies (3.7×10^{12} Bequerels).

- H. In accordance with UAC R313-15-1009(2)(a)(ii), waste received for disposal in the Containerized Waste Facility shall not be packaged in cardboard or fiberboard containers.
- I. The Licensee shall not accept for disposal any neutron source (e.g., polonium-210, americium-241, radium-226 in combination with beryllium or other target).
- J. Incinerator ash shall be treated, in preparation for disposal, in a manner that renders it non-dispersible in air.
- K. Radioactive waste containing chelating agents greater than 0.1 percent by weight shall be disposed of in the Mixed Waste Landfill Cell.
- L. The Licensee shall not accept containerized radioactive waste unless each waste package has been:
 - i. Classified in accordance with R313-15-1009, "Classification and Characteristics of Low-Level Radioactive Waste." In addition, the Licensee shall require that all radioactive waste received for disposal meet the requirements specified in the Nuclear Regulatory Commission, "Branch Technical Position on Concentration Averaging and Encapsulation", as amended.
 - ii. Marked as either Class A Stable or Class A Unstable as defined in the most recent version of the "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification." originally issued May, 1983 by the U.S. Nuclear Regulatory Commission.
 - iii. Marked with a unique package identification number, clearly visible on the package, that can be correlated with the manifest for the waste shipment in which the package arrives at the facility.
- M. The Licensee may accept containerized Class A LLRW in the following waste packages for disposal in the Containerized Waste Facility of the Class A West disposal cell:
 - i. DOT "strong, tight" containers in accordance with 49 CFR 173 and meeting the following void space criteria: void spaces within the waste and between the waste and its packaging shall be reduced to the extent practicable, but in no case shall less than 85 percent of the capacity of the container be filled.
 - ii. High-Integrity Containers (HICs) exceeding the void space criteria provided in License Condition 16.M.i, shall be approved by the Director.
 - iii. DOT "strong, tight" containers in accordance with 49 CFR 173 exceeding the void space criteria provided in License Condition 16.M.i and large components shall be placed as approved by the Director.
 - iv. Oversized DOT containers (larger than 215 cubic feet) meeting the void space criteria provided in License Condition 16.M.i shall be placed in accordance with the currently approved LLRW Construction QA/QC Manual.

MANAGEMENT OF FREE LIQUIDS

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17. A. In accordance with UAC R313-15-1009(2)(a)(iv), solid waste received for disposal shall contain as little free standing and non-corrosive liquid as reasonably achievable, but shall contain no more free liquids than one percent of the volume of the waste.
- B. Solid waste received and containing unexpected aqueous free liquid in excess of 1% by volume shall have the liquid removed and placed in the evaporation ponds or the liquid solidified prior to management.
- C. Unexpected non-aqueous free liquids less than 1% of the volume of the waste within the container shall be solidified prior to disposal.
- D. Should shipment(s) arrive with greater than 1% unexpected free liquids (total of aqueous and non-aqueous), the Licensee shall notify the Division of Radiation Control within 24 hours that the shipment(s) failed the requirements for acceptance and manage in accordance with the Waste Characterization Plan.

RADIATION SAFETY

18. The Licensee shall comply with the provisions of UAC R313-18, "Notices, Instructions and Reports to Workers by Licensees or Registrants—Inspections"; and UAC R313-15, "Standards for Protection Against Radiation."
19. The Licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of UAC R313-19-100, "Transportation."
20. Written procedures incorporating operating instructions and appropriate safety precautions for licensed activities shall be maintained and available at the location specified in License Condition 10.A. The written procedures established shall include the activities of the radiation safety and environmental monitoring programs, the employee training program, operational procedures, analytical procedures, and instrument calibration. At least annually, the Licensee shall review all procedures to determine their continued applicability.
21. The Licensee's Radiation Safety Officer (RSO) shall review and approve written procedures as stated in License Condition 20 and subsequent changes to the procedures related to waste disposal operations.

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ROUTINE MONITORING AND CONTAMINATION SURVEYS FOR NEW LICENSEES:

22. The Licensee shall conduct contamination surveys in accordance with Table 22-A:

TABLE 22-A

Type	Location	Frequency
A. Gamma Radiation Levels	1. Perimeter of Restricted Area(s)	1. Weekly
	2. Office Area (s)	
	2.a. [27] Decon Access Control Building	2.a. Weekly*
	2.b. [33] Mixed Waste Access Building	2.b. Weekly*
	2.c. [1] Accessible areas of the LLRW Building	2.c. Weekly
	2.d. [1] Inaccessible area of the LLRW Building	2.d. Weekly*
	2.e. [7] LLRW Operations Building	2.e. Weekly
	2.f. [100] Administration Building	2.f. Quarterly
	3. Eating/Change Area(s)	
	3.a. [27] Decon Access Control Building	3.a. Weekly*
	3.b. [33] Mixed Waste Access Building	3.b. Weekly*
	3.c. [1] Accessible areas of the LLRW Building	3.c. Weekly
	3.d. [1] Inaccessible area of the LLRW Building	3.d. Weekly*
	3.e. [7] LLRW Operations Building	3.e. Weekly
	3.f. [100] Administration Building	3.f. Quarterly
	4. Transport Vehicles	4. Upon vehicle arrival at site and before departure.
	5. Mixed Waste Facility	5. Weekly
	6. Decontamination facilities	

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Type	Location	Frequency
	6.a. [30] Boxwash	6.a. Weekly*
	6.b. [23] Rotary Rail Wash	6.b. Weekly
	6.c. Mixed Waste Decon Pad	6.c. Weekly*
	6.d. [20] Track 4 Rail Wash	6.d. Weekly
	6.e. [21] Intermodal Wash Facility	6.e. Weekly
B. Contamination Wipes	1. Eating Area(s)/Change Area(s)	
	1.a. [27] Decon Access Control Building	1.a. Weekly*
	1.b. [33] Mixed Waste Access Building	1.b. Weekly*
	1.c. [1] Accessible areas of the LLRW Building	1.c. Weekly
	1.d. [1] Inaccessible area of the LLRW Building	1.d. Weekly*
	1.e. [7] LLRW Operations Building	1.e. Weekly
	1.f. [100] Administration Building	1.f. Quarterly
	2. Reserved	
	3. Office Areas(s)	3.
	3.a. [27] Decon Access Control Building	3.a. Weekly*
	3.b. [33] Mixed Waste Access Building	3.b. Weekly*
	3.c. [1] Accessible areas of the LLRW Building	3.c. Weekly
	3.d. [1] Inaccessible area of the LLRW Building	3.d. Weekly*
	3.e. [7] LLRW Operations Building	3.e. Weekly
	3.f. [100] Administration Building	3.f. Quarterly
	4. Reserved	4. Reserved

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Type	Location	Frequency
	5. Equipment/Vehicles	5. Once before release
	6. Decontamination facilities	
	6.a. [30] Boxwash	6.a. Weekly*
	6.b. [23] Rotary Rail Wash	6.b. Weekly
	6.c. Mixed Waste Decon Pad	6.c. Weekly*
	6.d. [20] Track 4 Rail Wash	6.d. Weekly
	6.e. [21] Intermodal Wash Facility	6.e. Weekly
	7. Mixed Waste Facility	7. Weekly
	8. [24] Shredder Facility and control room	8. Weekly
	9. [23] Rotary Dump and control room	9. Weekly
C. Employee/Personnel	1. Skin & Personal clothing	1. Prior to exiting restricted area
D. Gamma Exposure	1. [100] Administration Bldg.(s)	1. Quarterly
E. Radon Concentration	1. [100] Administration Bldg.(s)	1. Quarterly

* When in operation/use, the survey shall be done weekly. When not in operation/use, the survey shall be done monthly. Operational status shall be documented weekly. Non-operational status is defined as no human entry other than routine health physics survey or security confirmation.

[#] Building numbers in parentheses are taken from Exhibit II-6 to the Contingency Plan provided as Attachment II-7 to the State-issued Part B Permit.

23. The Licensee shall determine internal exposure of employees under its bioassay program, in accordance with UAC R313-15-204.
24. The Licensee shall implement a respiratory protection program that is in accordance with UAC R313-15-703.
25. The Licensee shall calibrate air sampling equipment at intervals not to exceed six months.
26. The operational environmental monitoring program shall be conducted in accordance with the Environmental Monitoring Plan (dated January 5, 2012, or the most recent approved amendment to that plan).

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27. Vehicles, containers, facilities, materials, equipment or other items for unrestricted use shall not be released from the Licensee's control if contamination exceeds the limits found in Table 27-A. Except as provided in 49 CFR 173.443(d), conveyances used for commercial transport of radioactive waste or materials, may not be returned to service until the radiation dose rate at each accessible surface is 0.005 mSv per hour (0.5mrem per hour) or less, and there is no surface removable (non-fixed) radioactive surface contamination as specified in paragraph (a) of 49 CFR 173.443.

TABLE 27-A

Nuclide ^a	Column 1 Average ^{b,c,f}	Column 2 Maximum ^{b,d,f}	Column 3 Removable ^{b,e,f}
U-nat, U-235, U-238, and associated decay products	5,000 dpm alpha/ 100cm ²	15,000 dpm alpha/ 100cm ²	1,000 dpm alpha/ 100cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100cm ²	300 dpm/100cm ²	20 dpm/100cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100cm ²	3,000 dpm/100cm ²	200 dpm/100cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emissions or spontaneous fission) except Sr-90 and other noted above.	5,000 dpm beta, gamma/100cm ²	15,000 dpm beta- gamma/100cm ²	1,000 dpm beta- gamma/100cm ²

- Where surface contamination on both alpha-and beta-gamma emitting nuclides exists, the limits established for alpha-and beta-gamma emitting nuclides should apply independently.
- As used in this table, dpm (disintegration's per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
- Measurements of average contamination should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each such object.
- The maximum contamination level applies to an area of not more than 100 cm².
- The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping the area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.
- The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters shall not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured

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through not more than 7 milligrams per square centimeter of total absorber.

28. The Licensee shall submit the following to the Director for review and approval pending resolution of all issues as judged by the Director:
- A. The Licensee shall submit a corrective action plan for the Cover Test Cell for Director approval by no later than July 23, 2008. The corrective action plan shall identify all means necessary to collect valid data to verify actual performance of the cover system. Said plan shall include Cover Test Cell design, construction, instrumentation, monitoring, reporting, and comparison of actual performance to projected performance. The Cover Test Cell corrective action plan shall include:
 - i. Performance goals to meet the objective of verifying modeled cover system performance.
 - ii. Methodologies and plans that provide quantitative and qualitative results capable of satisfying the objective.
 - iii. Design, construction, and operational plans to implement the methodologies and plans.
 - iv. Quality control and quality assurance requirements of work to be performed. Quality control and quality assurance specifications and procedures shall state specific actions and processes the Licensee will use to ensure compliance with designs and specifications, monitoring, reporting, ensure data validity, timely detect data deficiencies, enhance accuracy of data interpretation, and ensure correctness of results prior to being submitted to the Division.
 - v. In the event that the plan results in new instrumentation or construction, the Licensee shall complete all such activities within 30-days of Director approval. Within 30-days of completion of said construction, the Licensee shall submit an As-Built report for Director approval.
 - B. The Licensee shall submit an annual report for Director approval by March 1 of each calendar year. This annual report shall detail the Licensee's progress in implementing the corrective action plan, provide the data collected in the past year, analyze the data, and interpret the meaning of the data relative to the overall objective of the corrective action plan.

REPORTING

29. The Licensee shall submit the following reports to the Director:

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- A. Quarterly results from the Environmental Monitoring Program , as amended. The report(s) shall be submitted within 90 days after the expiration of each calendar quarter. Calendar Quarter shall mean:

First Quarter	January, February, and March
Second Quarter	April, May, and June
Third Quarter	July, August, and September
Fourth Quarter	October, November, and December

- B. A quarterly summary report detailing the radioisotopes, activities, weighted average concentrations, volume, and tonnage for waste received during the calendar quarter. The report of volume (cubic feet and cubic yards) and tonnage (tons) shall be partitioned according to waste type: Low Level Radioactive Waste (LLRW), LLRW with PCBs, Mixed Waste (MW), MW with PCBs, MW Treatment, NORM, Containerized Class A, uranium/thorium mill tailings (i.e. 11e.(2) wastes), and waste generated prior to congress passing the Uranium Mill Tailings Radiation Control Act in 1978. The report(s) shall be submitted within 30 days after the expiration of each calendar quarter. Calendar Quarter shall mean:

First Quarter	January, February, and March
Second Quarter	April, May, and June
Third Quarter	July, August, and September
Fourth Quarter	October, November, and December

- C. Reserved
- D. For the Mixed Waste Landfill Cell, the Licensee shall ensure that the maximum acceptable activities, used as source terms in the groundwater performance modeling are not exceeded after facility closure. Therefore, the Licensee shall notify the Director, at the earliest knowledge, that the following nuclides are scheduled for disposal: berkelium-247 and chlorine-36.
- E. For the Class A West disposal cell, the Licensee shall ensure that the maximum acceptable activities used as source terms in the groundwater performance modeling are not exceeded after facility closure. Therefore, the Licensee shall notify the Director, at the earliest knowledge, that the following nuclides are scheduled for disposal: berkelium-247, calcium-41, chlorine-36, iodine-129, rhenium-187, and Technetium-99.
- F. An annual report shall be submitted by March 31st and shall report the cumulative void space (expressed as a percent of waste volume) disposed of in the Containerized Waste Facility for the previous year.
30. Except as provided by this condition, the Licensee shall maintain the results of sampling, analyses, surveys,

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and instrument calibration, reports on inspections, and audits, employee training records as well as any related review, investigations and corrective actions, for five (5) years. The Licensee shall maintain personnel exposure records in accordance with UAC R313-15-201.

STAFFING/QUALIFICATIONS

31. Radiation Safety operations for bulk, containerized and mixed waste, portable gauging device(s), radioactive source(s), and dosimeter calibrator(s)/irradiator(s) shall be conducted by or under the supervision of Thomas A. Brown, RSO.
32.
 - A. The Licensee's staff shall meet the qualifications as described in Appendix I (March 9, 2013, rev. 24).
 - B. Licensed material in License Conditions 6.C and 6.D. shall be used by, or under the supervision and in the physical presence of, the RSO or individuals who have been trained in the Licensee's standard operating and emergency procedures and have satisfactorily completed at least one of the following:
 - i. The device manufacturer's training course for safe use and handling of portable gauging devices containing licensed material; or
 - ii. A portable gauge training program conducted in accordance with the provisions of a specific license issued by the Director, an Agreement State or the U.S. Nuclear Regulatory Commission.
 - C. Licensed material in License Conditions 6.E through 6.P shall be used by, or under the supervision of, the RSO, or individuals designated in writing by the RSO.
 - D. The Licensee shall maintain the organizational independence of the programs that monitor and enforce employee safety, environmental protection, and public safety from programs responsible for production and profitability and other influences or priorities that might compromise quality and radiation safety.
 - E. The Licensee shall establish a method for any employee or contractor to anonymously submit questions, concerns, ideas, or other comments regarding employee safety, environmental protection, and public safety to the Corporate Radiation Safety Officer (CRSO). The method shall include documentation of all comments submitted, the Applicant's response to each comment, and a method for communicating the Licensee's response to employees and contractors.

CONSTRUCTION ACTIVITIES

33. The Licensee shall obtain prior written approval from the Director prior to construction of significant facilities. Significant facilities shall include, but are not limited to waste, stormwater, and wastewater related handling, storage, and transfer projects.
34. The Licensee shall address and resolve all concerns the Division has identified regarding clay mining activities in areas adjacent to Section 32, as provided in a February 16, 2007 Division letter to the Licensee, including a February 9, 2007 Round 1 Interrogatory by the URS Corporation (URS 39400018.3090). The Licensee shall deliver detailed analyses, explanations, descriptions, and appropriate justification to the Division no later than July 1, 2008. If the Director determines that unacceptable adverse conditions exist or

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might develop or evolve, the Licensee shall submit for approval a remedial action plan within 30 days of written notice of the determination by the Director. The remedial action plan will address, among other topics, description of proposed activities, justification that the proposed activities will be adequate to protect the facilities in Section 32 from possible impacts of clay mining, and engineering design, specifications, and construction of proposed remedial actions.

35. A. In accordance with UAC R313-25-8, effective June 1, 2010 the Licensee shall not dispose of significant quantities of concentrated depleted uranium prior to the approval by the Director of the performance assessment required in R313-25-8.
- B. Performance assessment: A performance assessment, in general conformance with the approach used by the Nuclear Regulatory Commission (NRC) in SECY-08-0147, shall be submitted for Director review and approval no later than June 1, 2011. The 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 minimum 1,000,000-year time frame for qualitative analysis.
- C. Revised disposal embankment design: If the performance assessment specified in paragraph 35.B indicates that changes to disposal operations and cover design are necessary to ensure compliance with the requirements of 10 CFR Part 61 or Utah Administrative Code R313, EnergySolutions will provide a revised design that does meet those requirements, for all wastes that have been and are reasonably anticipated to be disposed of at the facility within 180 days of Director approval of the performance assessment.
- D. Remediation: If following the completion of DRC's review of the performance assessment described in paragraph 35.B, the disposal of DU as performed after the date of this license condition would not have met the requirements of the performance assessment, the facility will undertake remediation to ensure that the performance standards are met, or if that is not possible, shall remove the DU and transport it off-site to a licensed facility.
- E. Surety: The Licensee shall fund the surety for the remediation, in License Condition 35.D. Within 30-days of the effective date of this license condition, the licensee shall submit for Director review and approval, the surety cost estimates for remediation of existing Savannah River DU waste disposal and planned, similar large quantity DU waste disposal.
36. A. The West Rail Spur and Unloading facility shall be operated as a transfer station for Surface Contaminated Objects (SCO) and large components, (waste storage is prohibited). These objects may be set on the gravel pad for 24 hours to facilitate unloading and transferring to the Class A West disposal cell.
- B. The West Rail Spur and Unloading facility shall be operated as a transfer station for conveyances to be unloaded at the Containerized Waste Facility (unloading of waste packages is prohibited).

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37. All ion exchange resins shall be disposed of as follows:
- A. Solidified using solidification agents approved by the Director and disposed of in the Containerized Waste Facility; or
 - B. Packaged in High-Integrity Containers (HIC) approved by the Director, carbon-steel liners, unapproved HICs, or poly HICs meeting the void space criteria described in License Condition 16.M.i and disposed of in the Containerized Waste Facility; or
 - C. Packaged in High-Integrity Containers (HIC) approved by the Director, carbon-steel liners, unapproved HICs, or poly HICs not meeting the void space criteria described in License Condition 16.M.i and disposed of as approved by the Division under License Condition 16.M.ii or 16.M.iii in the Containerized Waste Facility; or
 - D. Disposed of in accordance with the requirements of the Construction Quality Assurance/Quality Control Manual.
38. The Licensee shall construct the Class A West disposal Cell identified in the Ground Water Quality Discharge Permit No. UGW450005 and in accordance with approved engineering design drawings "Series 10014".
39. Waste placement and backfilling within the Containerized Waste Facility shall be conducted in accordance with the following:
- A. The Containerized Waste Facility shall conform to the characteristics defined, analyzed, and described in the Engineering Justification Report "Class A Disposal Cell Containerized Waste Facility" (dated April 12, 2001); Engineering Justification Report, Addendum "Fifteen Percent Void Space Criteria" (Revision 1 dated October 10, 2001); and the AMEC letter to Envirocare of Utah, Inc. "Placement of Drums and B-25 Containers with 15 Percent Voids; Envirocare Class A - Containerized Waste Facility Near Clive, Utah" (dated October 2, 2001). Waste containers that have void space in excess of 15 percent shall be filled to the top of the container opening using Controlled Low Strength Material (CLSM) in accordance with the Construction QA/QC manual. The Licensee is exempt from the CLSM cold weather requirements and the 48 hour notification for void remediation only at the CWF Facility.
 - B. Waste container configurations, backfill materials and associated placement activities, shall be those approved by the Director following specifications contained in the Work Element: Containerized Waste Facility-Waste Placement Test Pad and the Work Element Containerized Waste Facility- Waste Placement Sections of the currently approved LLRW Construction Quality Assurance/Quality Control Manual.
 - C. Waste delivered in a shielded transportation cask shall remain in the cask until the waste is approved for disposal and the disposal location is prepared for the shipment. Waste received for disposal in the

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Containerized Waste Facility shall not be handled, stored or transferred within the contaminated portion of the Restricted Area without the approval of the RSO.

- D. The Containerized Waste Facility shall be operated as a contamination-free portion of the Restricted Area until containerized waste disposal operations are completed. Bulk waste may then be used to complete the filling of the cell.
- E. Interim storage is applicable only to the Containerized Waste Facility. Packages containing radioactive material shall not be stored for a period of longer than 30 days from the date of receipt. Retention of waste materials above ground pending disposal up to 3 working days does not constitute storage. Areas surrounding packages in storage shall be managed in accordance with the most current version of EnergySolutions' Standard Operating Procedure (SOP) CL-RS-PR-150, *Posting Requirements for Radiological Hazards*.
- F. Disposal of non-containerized decomposable or compressible waste at the Containerized Waste Facility is prohibited. Such waste shall be disposed of as debris in bulk waste portions of the Class A West disposal embankment, in accordance with debris placement requirements of the currently approved LLRW and 11e.(2) CQA/QC Manual.
40. The LARW and Class A West Disposal Cells, shall be defined by the areas enclosed by the points of reference in the Ground Water Quality Discharge Permit No. UGW450005. The Containerized Waste Facility within the Class A West disposal cell shall be separated from the non-containerized area by a 6-foot chain link fence on the berm around the Containerized Waste Facility perimeter area.
41. On or before August 1, 2012, the Licensee shall submit, for Director's review and approval, a detailed plan for a study of the clayey soils to be used in the radon barrier of the CAW embankment cover. The objective of this study is to determine the amount of strain that the soils can withstand without cracking when subjected to both axial lengthening and bending as would be experienced when the clay settles differentially as part of the cover system. Within nine months of Director's approval of the study plan, the Licensee shall execute the study and submit a report with results of the study. Based on results of the study and the Director's review, the Director may require the Licensee to modify the embankment and cover design.
42. On or before December 21, 2012, the Licensee shall submit a revised cover design (including at least descriptions, design calculations, drawings, and specifications) and an assessment addressing performance of the revised Class A West cover design and transport of potential releases from the proposed Class A West disposal unit.
43. Construction of the clay liner for the Class A West (CAW) embankment between the Class A (CA) and Class A North (CAN) embankments, or receipt of waste volumes exceeding the total waste capacity of the CA and CAN embankments (minus the volumes generated during facility decommissioning) is prohibited until the Licensee funds the financial surety for decommissioning of the CAW embankment as designed and approved.

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44. The Licensee shall fulfill all requirements and maintain compliance with all conditions in the LLRW CQA/QC Manual and engineering drawings currently approved by the Director.
45. All engineering related soil tests conducted by the Licensee to demonstrate compliance with Condition 44 shall be performed by a laboratory certified and accredited by the AASHTO Materials Reference Laboratory (AMRL). Said certification/accreditation shall apply to clay liner, clay radon barrier, soil filter layers, sacrificial soils, and riprap materials, or other soil or man-made materials as directed by the Director. Said certification shall include all engineering test methods required by License Condition 44, or as directed by the Director. Certification is not required for the DRC approved sealed single ring infiltrometer permeability test contained in Appendix B to the LLRW and 11e(2) CQA/QC Manual.
46. Reserved
47. The Licensee shall not initiate disposal operations in newly excavated or newly tied-in areas until the Division has inspected and the Director has approved the cell/embankment liner.

CONSTRUCTION DRAWINGS.

48. A. The Licensee shall provide a comprehensive set of drawings for the entire Clive site. The drawings shall correctly: (1) locate all structures, utilities, fences, ponds, drainage features railroad tracks, roads, storage facilities, loading and off-loading facilities, disposal embankments, all environmental monitoring locations including instruments/devices, and any other appurtenances related to the operation, maintenance and closure of the disposal facility; and (2) provide survey control including elevations in sufficient detail to fully describe the site. The drawings shall be developed in accordance with the standards of professional care. A drawing index shall be included that identifies drawings by discrete number. Each drawing shall include a revision block that documents the latest changes or modifications by date and includes the initials of the responsible reviewer for QA/QC tracking purposes.
- B. Drawings showing approved future designs shall be marked as "Final Drawings." Final drawings or drawings developed for construction shall be sealed by a Utah registered professional engineer. The drawings shall be developed in accordance with the standards of professional care.
- C. Within 30 days of completion of any project that requires approval by the Director, a set of "As-Built" drawings shall be submitted for review. The drawings shall indicate as-built conditions as they existed no earlier than 30 days prior to the submittal. Drawings of finished construction shall be marked as "As-Built" in the final entry in the revision block.

SITE OPERATING PROCEDURES

49. Shipments containing free liquid in excess of 1% shall be absorbed, evaporated, or the liquids removed only at facilities with approved secondary containment or the rail rollover facility.

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50. A. On-site generated waste shall be managed according to its radiological, physical and chemical characteristics. Solid phase material shall be disposed in either the Class A West Cell, Mixed Waste Cell, or the 11e.(2) Cell. Waste water from decontamination facilities will be put in the evaporation ponds or sprayed on disposal cells for purposes of dust and engineering controls.
- B. Site equipment that has reached the end of its useful life, is not operational and does not meet the removable contamination limits of License Condition 27, Table 27-A, shall be disposed in the LLRW Class A West Cell within 90 days as debris in accordance with requirements of the LLRW Construction Quality Assurance/Quality Control Manual or stored on approved facilities for storage, transfer, and sampling of bulk waste.
- C. Facility vehicles transferring or unloading waste shall not be left unattended.
51. The following shall be implemented for LLRW and 11e.(2) Waste segregation purposes:
- A. LLRW and 11e.(2) waste shall not be managed simultaneously at the Rail rollover facility, Shredder Facility, Rotary Dump Facility, or Rail Digging facility;
- B. Any vehicle or facility used to manage waste for disposal within the 11e.(2) disposal embankment, must be clearly labeled to designate 11e.(2) management. The labels shall be visible from both sides of a vehicle/facility designated for 11e.(2) waste management.
- C. Equipment, vehicles and facilities, which are used for management of LLRW will be cleaned of any material before being used for 11e.(2) waste management activities. Equipment, vehicles and facilities shall be cleaned of all waste material to a limit of 500 grams per square foot prior to being used for other waste types.
52. Waste shipments or transportation packages received shall meet the following contamination control requirements for removable contamination
- * Less than 220 dpm/100cm² alpha
 - * Less than 2200 dpm/100cm² Beta-gamma
- If a shipment or transportation package does not meet the above contamination requirements, the Licensee shall take actions to reduce the risk for spread of contamination.
53. A. Quarterly, the Licensee shall clean the facility roads, or more frequently when needed. The material collected from cleaning the roads shall be disposed within an approved disposal embankment for Class A waste.
- B. On a biweekly basis (once every two weeks) between the first day of May and the last day of September, the Licensee shall spray a polymer solution on all exposed contaminated cell areas and

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areas of waste within the Class A West Cell which has been disturbed in the previous two weeks. The Licensee will apply a polymer-based stabilizer in accordance with the manufacturer's instructions.

- C. The Licensee shall minimize the dust created during the process of placing and moving waste, through the use of water. Water or other engineering controls shall be placed on roads and in areas which work is being performed.
 - D. The Licensee shall cease loading, hauling, and dumping of un-containerized waste whenever the 5-minute average wind velocities exceed 35 miles per hour. When both the 5-minute average and 5-minute maximum wind velocities are less than 35 mph as observed on the meteorological station, management of un-containerized waste may resume.
54. The Licensee shall fulfill and maintain compliance with all conditions and requirements in the Site Radiological Security Plan (Revision 4, October 6, 2011).
55. A. For the Class A West disposal cell, the Licensee shall ensure that the average concentrations of selected radionuclides do not exceed the limits stated in Table 55A.

Table 55A. Limiting Radionuclide Concentrations in Waste Disposed of in Class A West Disposal Cell.		
Radionuclide	Maximum Average Radionuclide Concentration¹ in Waste Disposed of Under Top Slope (pCi/g)	Maximum Average Radionuclide Concentration¹ in Waste Disposed of Under Side Slope (pCi/g)
berkelium-247	0.0065	0.00388
calcium-41	35,300	34.1
chlorine-36	15.9	9.72
iodine-129	---	21.9
rhenium-187	---	19,100
technetium-99	---	1,720

1. Maximum average radionuclide concentration for a radionuclide is determined as the quotient of the Total Activity (in picocuries) of that radionuclide disposed of under the respective slope and the Total Mass disposed of under the respective slope for the Active Cell (in grams) + Completed Cell (in grams).

- B. For the Mixed Waste disposal cell, the Licensee shall ensure that the actual cumulative activity of chlorine-36 does not exceed 8.75 picocuries per gram in accordance with the following formula:

$$\frac{\text{Total Activity of chlorine-36 Received (picocuries)}}{\text{Total Mass of Active Cell (grams) + Completed Cell (grams)}} \leq 8.75 \text{ picocuries per gram}$$

- C. For the Mixed Waste disposal cell, the Licensee shall ensure that the actual cumulative activity of

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berkelium-247 does not exceed 0.00314 picocuries per gram in accordance with the following formula:

$$\frac{\text{Total Activity of berkelium-247 Received (picocuries)}}{\text{Total Mass of Active Cell (grams) + Completed Cell (grams)}} \leq 0.00314 \text{ picocuries per gram}$$

56. Containerized Class A waste shall be certified by the generator to meet the Waste Acceptance Criteria in accordance with the Waste Characterization Plan described in License Condition 58.
57. A. The Licensee shall move rail shipments into the Restricted Area within seven (7) days of arrival. The shipments may be returned to the carrier when management of the waste is not possible within the seven (7) day period, unless additional time is approved by the Director of the Utah Division of Radiation Control.
- B. Empty outbound railcars shall be picked up by the local rail service within seven (7) days of release from the Restricted Area, unless additional time is approved by the Director of the Utah Division of Radiation Control.
- C. Railcars that have been decontaminated and surveyed both internally and externally and found to meet criteria of non-fixed radioactive surface contamination less than 220 dpm/100 cm² Alpha, 2,200 dpm/100 cm² Beta and a dose rate less than 0.5 mrem/hr or that meet the limits found in Table 27-A do not have to be picked up by local rail service within seven (7) days.
- D. The Licensee may perform the following activities on incoming shipments on rail lines outside of Section 32, not including the main line adjacent to Section 32:
1. Visual Inspection
 2. Radiation level surveys
 3. Affix labels
58. The Licensee shall fulfill and maintain compliance with all conditions and requirements in the LLRW Waste Characterization Plan (dated October 8, 2009).
59. Reserved.
60. Wind dispersed Dry Active Waste (DAW) located outside of the Contaminated Restricted Area is prohibited.
61. Truck, railcar, and other equipment washdown (decontamination) facilities, including evaporation ponds, shall be controlled with fences or other approved barriers to prevent intrusion.
62. All burial embankments and waste storage areas, including immediately adjacent drainage structures, shall be controlled areas, surrounded by a six-foot chain link fence. Upon site closure, all permanent fences shall be six feet high chain link topped with three strand barbed wire, tip tension wire, and twisted selvedge.

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63. Radioactive and mixed wastes within Section 32 and all rail spurs controlled by the Licensee around the Licensee's Disposal Facility are possessed by the Licensee. Waste conveyed to the facility by truck is in transport as long as the commercial carrier driver and vehicle remain at the Clive disposal facility. The Licensee does not possess such waste for purposes of determining compliance with surety requirements and SNM quantity limits, except that the Licensee does, however, possess any waste containing SNM that is not disposed of on the day it is delivered to the facility.
64. "Disposal" is the locating of radioactive waste into a lift of the disposal embankment. Disposal does not include the storage of waste in containers on a lift when the container will ultimately be emptied, the staging of containerized waste in the disposal embankment; or waste as "In Cell Bulk Disposal."

MANIFEST/SHIPPING REQUIREMENTS

65. The Licensee shall comply with UAC R313-15-1006 and UAC R313-25-33(8), Requirements for Low-Level Waste Transfer for Disposal at Land Disposal Facilities and Manifests.
66. The Licensee shall not accept radioactive waste for storage and disposal unless the Licensee has received from the shipper a completed manifest that complies with UAC R313-15-1006 and UAC R313-25-33(8).
67. The Licensee shall maintain copies of complete manifests or equivalent documentation required under Conditions 65 and 66 until the Director authorizes their disposition.
68. The Licensee shall immediately notify the Director or the Division's on-site representative of any waste shipment where there may be a possible violation of applicable rules or license conditions.
69. The Licensee shall require anyone who transfers radioactive waste to the facility to comply with the requirements in UAC R313-15-1006.
70. The Licensee shall acknowledge receipt of the waste within one (1) week of waste receipt by returning a signed copy of the manifest or equivalent document to the shipper. The shipper to be notified is the Licensee who last possessed the waste and transferred the waste to the Licensee. The returned copy of the manifest or equivalent documentation shall indicate any discrepancies between materials listed on the manifest and materials received.
71. The Licensee shall notify the shipper (e.g., the generator, the collector, or processor) and the Division when any shipment or part of a shipment has not arrived within 60 days after receiving the advance manifest.
72. The Licensee shall maintain a record for each shipment of waste disposed of at the site. At a minimum, the record shall include:
- A. The date of disposal of the waste;
 - B. The location of the waste in the disposal site;

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- C. The condition of the waste packages received;
- D. Any discrepancy between the waste listed on the shipment manifest or shipping papers and the waste received in the shipment;
- E. A description of any evidence of leaking or damaged packages or radiation or contamination in excess of applicable regulatory limits; and
- F. A description of any repackaging of wastes in any shipment.

FINANCIAL ASSURANCE/CLOSURE

73. The Licensee shall at all times maintain a Surety that satisfies the requirements of UAC R313-25-31 in an amount adequate to fund the decommissioning and reclamation of Licensees' grounds, equipment and facilities by an independent contractor. The Licensee shall annually review the amount and basis of the surety and submit a written report of its findings by December 1 each year for Director approval. At a minimum, this annual report shall meet the following requirements:

- A. Summary of Changes – the annual report shall include a written summary of any change in the cost estimate previously approved by the Director, including, but not limited to:
 - i. A description of any modification, addition, or deletion of any direct cost or post-closure monitoring and maintenance (PCMM) cost line item, including supporting justification, calculations and basis;
 - ii. Any change to the unique reference number (cost line item) assigned approved by the Director for any direct or PCMM cost line item;
 - iii. Updates to the cost estimate for decommissioning the CAW embankment to ensure the cost estimate remains current in the event that the Director determines the CA and CAN embankments must be closed as a single embankment using the approved design of the CAW embankment. The cost estimate must meet the requirements of License Condition 73; and,
 - iv. Updates to the cost estimates for closing and decommissioning the CA and CAN embankments as separate embankments using the approved designs for each embankment. The surety shall be based on the approved cost estimate for the CA and CAN embankments until the Director determines it is no longer feasible for the CA and CAN embankments to be closed separately. At that time, the surety shall be based on the approved cost estimate provided for License Condition 73.A.iii. The update to the cost estimate for the CA and CAN embankments must include funding to move excess materials that have been placed outside of the approved CA design to the CAN embankment, as well as all other costs associated with closing the CA and CAN embankments separately. The cost estimate must meet the requirements of License Condition 73.
- B. Indirect Costs shall be based on the sum of all direct costs in accordance with the following values:

Surety Reference No.	Description	Percentage
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Surety Reference No.	Description	Percentage
300	Working Conditions	5.5%
301	Mobilization/ Demobilization	4.0%
302	Contingency	15.0%
303	Engineering and Redesign	2.25%
304	Overhead and Profit	19.0%
305	Management Fee and Legal Expenses	4.0%
306	DEQ Oversight	4.0%

- C. RS Means Guide estimates of direct construction costs provided in the annual report shall be derived from or based on the most recent edition of the RS Means Guide for Heavy Construction.
- D. Report Certification – the annual report shall be prepared under the direct supervision of and certified by a Professional Engineer or Professional Geologist currently licensed by the State of Utah with at least five (5) years of construction cost estimation experience. The annual report shall be developed in accordance with the standards of professional care.
- E. Electronic Format – the Licensee shall provide the report in both paper and electronic formats, as directed by the Director.
- F. Within 60-days of Director approval of said annual report, the Licensee shall submit written evidence that the surety has been adequately funded.
- G. The Licensee shall prepare and maintain current a gravel resource evaluation report on-site that quantifies the gravel reserves remaining in the Grayback Hills Gravel Pit located in Section 24 of T. 1 N., R. 12 W (SLBM). Such report shall be prepared and certified on or before December 1 of each year by a professional engineer or professional geologist currently registered in the State of Utah.
74. One (1) year prior to the anticipated closure of the site, the Licensee shall submit for review and approval by the Director a site decontamination and decommissioning plan. As part of this plan, the Licensee shall demonstrate by measurements and/or modeling that concentrations of radioactive materials which may be released to the general environment, after site closure, will not result in an annual dose exceeding 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member

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of the public.

75. In accordance with UAC R313-25-33(6), the Licensee shall submit a financial statement annually by March 31st of each year for the previous year.
76. The Licensee shall at all times maintain a Surety for perpetual care, using an instrument that satisfies the requirements of UAC R313-22 and R313-25. The Surety shall be in the amount last approved by the Radiation Control Board, as provided in Utah Code Ann. 19-1-307(2), as adequate to fund perpetual care, less the amount contributed to the Radioactive Waste Perpetual Care and Maintenance Account created under Utah Code Ann. 19-3-106.2.

SPECIAL HANDLING

77. Except while waste packages are being handled in the active areas of the Containerized Waste Facility, external gamma radiation levels shall be posted in accordance with the most current version of EnergySolutions' SOP CL-RS-PR-150, *Posting requirements for Radiological Hazards*.
78. The Licensee shall observe the following controls on waste handling at the Containerized Waste Facility:
- A. Before unloading any waste container whose external gamma radiation at the surface exceeds 10 R/hr, an ALARA review shall be performed and documented and a pre-job briefing shall be conducted.
 - B. As part of the ALARA review, the Licensee shall determine and record (1) estimates of the radiation dose rates for the waste container, disposal unit working face, and any other potentially significant radiation sources; (2) expected durations of exposures to and distances from each radiation source; and (3) expected doses to each person involved in the actual disposal operation.
 - C. Before unloading any waste container whose external gamma radiation at the surface exceeds 200 R/hr, a practice run shall be conducted. The practice run shall involve shielding, container(s) filled with non-radioactive material, and handling equipment that are similar to those involved with the actual shipment. Similarity includes similar rigging and physical characteristics (e.g., weight, dimensions, and attachments). Those personnel who will participate in receiving, processing, handling, and disposing of the actual waste will participate in the practice run, using actual procedures. The Licensee shall notify the Division 24 hours in advance of conducting the practice runs.
 - D. On a case-by-case basis, the Director may exempt the Licensee from conducting the required practice run, considering the results of earlier practice runs and actual experience handling waste containers with high radiation levels.
79. Reserved.
80. The Licensee shall notify in writing the Director at the earliest possible date, but no later than 10 days before scheduled receipt of each shipment with contact radiation levels in excess of 200 R/hr. The notification shall include the anticipated dates of receipt and plan for disposal in the Containerized Waste Facility.

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81. The RSO or other qualified person designated by the RSO shall be present for and shall observe the receipt, processing, handling, and disposal of each waste package with contact radiation levels in excess of 200 R/hr.
82. The Licensee shall dispose of only closed containers in the Containerized Waste Facility. The Licensee shall not dispose of any breached waste container in the Containerized Waste Facility without first repairing the breached container or overpacking it in an undamaged container. The Licensee is authorized to open packages at its facility only to:
- A. Repair or repackage breached containers.
 - B. Inspect for compliance with conditions of this license.
 - C. Confirm package contents and fill voids in packages/containers that have greater than 15% void space.
 - D. Accomplish other purposes as approved by the Director.
83. The Licensee shall handle and emplace LLRW packages in the Containerized Waste Facility such that packaging integrity is maintained during handling, emplacement, and subsequent backfilling. Waste packages deposited in the Containerized Waste Facility shall be protected from any adverse effects of operations which may damage them.

SEALED SOURCES AND/OR DEVICES

84. A. i. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or by equivalent regulations of an Agreement State.
- ii. In the absence of a certificate from a transferor indicating that a leak test has been made within the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or by equivalent regulations of an Agreement State prior to the transfer, a sealed source received from another person shall not be put into use until tested.
- iii. Sealed sources need not be tested if they are in storage and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 3 years without being tested for leakage and/or contamination.
- iv. The leak test shall be capable of detecting the presence of 185 becquerels (0.005 μCi) of radioactive material on the test sample. If the test reveals the presence of 185 becquerels (0.005 μCi) or more of removable contamination, a report shall be filed with the Director in accordance with R313-15-1208, and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Utah Radiation Control Rules. The report shall be filed within 5 days of the date the leak test result is known with the Division of

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Radiation Control, P.O. Box 144850, Salt Lake City, Utah 84114-4850. The report shall specify the source involved, the test results, and corrective action taken.

- v. (a) The Licensee is authorized to collect leak test samples in accordance with Condition 85.D of this license, the Licensee's renewal application (dated March 1, 2001), and the Licensee's Memo (dated March 11, 2002).
 - (b) The analysis of leak test samples shall only be performed by individuals who meet the qualifications of a Radiation Safety Technician I or II, as defined by this license. The analysis of leak test samples shall be performed in accordance with the Licensee's renewal application (dated March 1, 2001), and the Licensee's Memo (dated March 11, 2002). Alternatively, tests for leakage and/or contamination, including sample collection and analysis, may be performed by other persons specifically licensed by the Director, the U.S. Nuclear Regulatory Commission, or an Agreement State to perform such services.
 - vi. Records of leak test results shall be kept in units of Becquerels or microcuries and shall be maintained for inspection by representatives of the Director.
- B. Sealed sources or source rods, containing licensed material shall not be opened or sources removed from source holders, devices, or detached from source rods by the Licensee, except as specifically licensed by the Director, an Agreement State, or the U.S. Nuclear Regulatory Commission to perform such services.
- C. The Licensee shall conduct a physical inventory every six months to account for all sealed sources and/or devices received and possessed under this license. The records of inventories shall be maintained for three years from the date of the inventory for inspection by the Division, and shall include the quantities and kinds of radioactive material, manufacturer's name and model numbers, location of the sources and/or devices, and the date of the inventory.

PORTABLE GAUGING DEVICES:

85. A. Each portable gauging device shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The gauge or its container must be locked when in transport, storage or when not under the direct surveillance of an authorized user.
- B. Each portable gauging device shall be kept under the constant surveillance (direct surveillance) of individuals trained in accordance with Condition 32.B of this license, when the device is not in secured storage, as required by Condition C of this license condition.
- C. Reserved.
- D. Any cleaning and/or maintenance of portable gauging device(s) or the collection of leak test samples, performed by the Licensee, shall only be performed with the radioactive source/source rod in the safe shielded position.

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- E. All cleaning and/or maintenance of portable gauging device(s), performed by the Licensee shall only be performed in accordance with Condition D of this license condition, and the manufacturer's instructions and recommendations.
- F. Any cleaning, maintenance, or repair of portable gauging device(s) that requires removal of the sources/source rod shall be performed only by the manufacturer or by other persons specifically licensed by the Director, an Agreement State, or the U.S. Nuclear Regulatory Commission to perform such services.

DOSIMETER CALIBRATOR(S)/IRRADIATOR(S):

- 86. A. The LDM-2000 reader shall only be connected to a maximum of two IRD-2000 irradiator modules.
- B. Devices(s) shall only be:
 - i. installed in areas where device(s) can be secured and limited to individuals authorized to use device(s) pursuant to Condition A of this license condition and Condition 32.C of this license.
 - ii. used by individuals who meet the qualifications of a Radiation Safety Technician I or II, as defined by this license.
 - iii. used in accordance with the manufacturer's operating manual and certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or by equivalent regulations of an Agreement State. The Licensee shall follow the manufacturer's recommendations for preventative maintenance and operational testing.
- C. Maintenance and servicing of device(s) shall only be performed by the manufacturer or persons specifically licensed by the Director, the U.S. Nuclear Regulatory Commission, or an Agreement State to perform such services.
- D. The Licensee shall not perform calibration(s) for non-MGP Instrument dosimeters.

INCREASED CONTROL CONDITIONS

- 87. The Licensee shall comply with the requirements described in the Division's letter dated November 14, 2005 and attached document to the Division's letter entitled "Increased Controls for Licensees that Possess Sources Containing Radioactive Material Quantities of Concern." The Licensee shall complete implementation of said requirements before May 15, 2006 or the first day that radionuclides in quantities of concern are possessed at or above the limits specified in Table 1, provided as an attachment to the Division's letter dated November 14, 2005, whichever is later. Within 25 days after the implementation of the requirements of this License Condition, the Licensee shall notify the Director in writing that it has completed the requirements of this License Condition.
- 88. The licensee shall comply with requirements described in the Director's letter dated May 16, 2008, Attachment 1, "Fingerprinting and Criminal History Records Check Requirements for Unescorted Access to Certain Radioactive Material" and Attachment 2, "Specific Requirements Pertaining to Fingerprinting and Criminal History Records Checks." The requirements of this license condition shall be implemented as part

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of the trustworthiness and reliability program of the Increased Controls requirements.

- A. On or before August 14, 2008, the licensee shall provide under oath or affirmation, a certification that the Trustworthiness and Reliability Official is deemed trustworthy and reliable by the licensee as required in paragraph 2.B of Attachment 1, "Fingerprinting and Criminal History Records Check Requirements for Unescorted Access to Certain Radioactive Material."
- B. All fingerprints obtained by the licensee pursuant to this requirement must be submitted to the U.S. Nuclear Regulatory Commission for transmission to the U.S. Federal Bureau of Investigation (FBI). Additionally, the licensee's submission of fingerprints shall also be accompanied by a certification, under oath and affirmation, of the trustworthiness and reliability of the Trustworthiness and Reliability Official as required by paragraph 2.B of Attachment 1, "Fingerprinting and Criminal History Records Check Requirements for Unescorted Access to Certain Radioactive Material."
- C. The licensee shall complete implementation of the fingerprinting requirements on or before November 12, 2008. The licensee shall notify the Director when full compliance with the requirements described in the Director's letter dated May 16, 2008, Attachment 1, "Fingerprinting and Criminal History Records Check Requirements for Unescorted Access to Certain Radioactive Material" and Attachment 2, "Specific Requirements Pertaining to Fingerprinting and Criminal History Records Checks" have been achieved. Notification to the Director shall be made within twenty-five (25) days after full compliance has been achieved.
- D. The licensee shall notify both the Director and the U.S. Nuclear Regulatory Commission within 24 hours if the results from a criminal history records check indicate that an individual is identified on the FBI's Terrorist Screening Data Base.

CLOSEOUT CONDITIONS

89. Except as specifically provided otherwise in this license, the Licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Utah Radiation Control Rules, Utah Administrative Code R313 shall govern unless the statements, representations, and procedures in the Licensee's application and correspondence are more restrictive than the rules.

- A. License renewal application, Revision 2, dated June 20, 2005.
- B. The following documents refer to revisions made in Amendment 22:
 - (1) Letter CD04-0481, dated October 27, 2004, Amendment and Modification Request – Class A North Embankment.
 - (2) Letter CD04-0548, dated December 23, 2004, Revised Class A North Disposal Embankment License Amendment Request.
 - (3) URS Review of Revised Class A North Embankment Amendment Request, dated December 29, 2004.

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- (4) Letter CD05-0024, dated January 17, 2005, Class A North Disposal Embankment License Amendment Request Revision 2.
 - (5) Letter CD05-0265, dated May 20, 2005, Revision of Appendix R, Environmental Monitoring and Surveillance Plan.
 - (6) Letter CD05-0266, dated May 25, 2005, Surety Calculations for the Class A North Disposal Cell.
 - (7) Memo: Treesa Parker to John Hultquist, dated May 25, 2005, proposed revisions to RML for Amendment 22
 - (8) Email: Treesa Parker to Christine Hiaring, dated June 1, 2005, License Amendment 22 Minor Changes for Consistency.
- C. The following documents refer to revisions made in Amendment 22A:
- (1) Division letter dated November 14, 2005.
- D. The following documents refer to revisions made in Amendment 22B:
- (1) Letter CD05-0333, dated June 30, 2005, RML no. UT 2300249 Request for approval of revisions to Appendix I, Organization, and amendment of License Condition 32.A.
 - (2) Memorandum dated August 2, 2005, Subject; Review of Appendix I
 - (3) Letter CD05-0398, dated August 16, 2005, Request for approval of revisions to Appendix I, Organization and amendment of license condition 31.A,B,C, and 32.A.
 - (4) Letter CD05-0507, October 26, 2005, Additional information regarding proposed revisions to Appendix I, Organization and amendment of license condition 31.A,B,C, and 32.A.
 - (5) Letter CD05-0453, dated September 19, 2005 Request for amendment of License Condition 9.10 RML UT2300478; Organization.
 - (6) Letter dated November 22, 2005, Request for information regarding request to revise Appendix I of the 11e(2) License Application and Amendment of L.C. 9.10.
 - (7) Letter dated October 11, 2005, Re: Request for Information: Revision to Appendix I and amendment 31A. B. C. and 32.A. dated August 16, 2005 (CD05-0398).
 - (8) Memorandum, dated October 3, 2005, Subject; Appendix I, revisions to RML UT2300249 conditions 31 A, B, C, and 32 A.
 - (9) Letter CD05-0411, dated August 23, 2005, Payment of administrative cost for Appendix I amendment request dated August 16, 2005.
 - (10) Letter CD05-0472, dated September 30, 2005, License condition 39.E amendment
 - (11) Email dated August 10, 2005, Subject: Draft amendment for LC 39.E and attached August 10, 2005, License Condition 39 E. amendment "draft".
 - (12) Email dated September 16, 2005, Subject: RE: FW: Draft amendment for LC 39.E.
 - (13) Letter CD05-0285, dated June 1, 2005, Envirocare containerized waste facility concrete overpacks corrective action plan.
 - (14) Letter dated June 2, 2005, filling waste package voids at the containerized waste facility using controlled low strength material (CLSM)
 - (15) Letter CD05-0326, dated June 27, 2005, Re: Letter to Mr. Dane Finerfrock, dated April 13, 2005, CD05-0181.
 - (16) Letter CD05-0366, dated July 26, 2005, Re: Letter to Dane Finerfrock, dated June 27, 2005,

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CD05-0326.

- (17) Letter CD06-0011, dated January 12, 2006, Request to amend License Condition No. 2, Address.
- (18) Letter CD06-0043, dated February 3, 2006, Request to amend License Condition No. 1, Company Name.
- (19) Letter dated February 6, 2006, evidence of name change with the Utah Department of Commerce.
- (20) Email dated October 6, 2005, Subject: License condition 39.E.
- (21) Memorandum from Woodrow W. Campbell through Loren Morton and Dane Finerfrock to Envirocare File, dated January 13, 2006 regarding AMRL Soils Lab Certification for the Envirocare Soils Lab.
- (22) Email dated February 15, 2006, from Loren Morton to Dan Shrum, Subject: License Amendment for Condition 73.
- (23) Email dated December 23, 2005, from Loren Morton to Dane Finerfrock, Subject: Proposed Changes to License Condition 73 - Annual Surety Evaluation Report.
- (24) Letter dated February 22, 2006, Subject: Revise void remediation procedure OPC-6.0.

E. The following documents refer to revisions made in Amendment 22C:

- (1) Letter CD05-0435, dated September 8, 2005, Request to amend RML UT 2300249: Condition 58, Waste Characterization Plan.
- (2) Letter CD05-0557, dated December 5, 2005, RML UT 2300249; Condition 58 Waste Characterization Plan –Revised License Amendment Request.
- (3) Letter CD06-0072, dated February 27, 2006, Radioactive Material License UT 2300249: Condition 58 Waste Characterization Plan – Revised License Amendment Request.
- (4) Email dated February 24, 2006, from Boyd Imai to Sean McCandless Re: Waste Characterization Plan.
- (5) Letter CD06-0059, dated February 15, 2006, Radioactive Material License UT 2300249 –Self Identified Noncompliance.
- (6) Letter dated March 17, 2006, from the DRC regarding the February 15, 2006, letter of noncompliance.
- (7) Letter CD06-0055) dated February 9, 2006, Request to Amend RML UT 2300249 to show addition of Liquid Radioactive Sources to License Condition 6.E.
- (8) Letter (CD06-0092) dated March 8, 2006, RML UT 2300249; Request for administrative amendment. Conditions 21.A and B and Condition 81.

F. The following documents refer to revisions made in Amendment 22E:

- (1) CD06-0389, "Request to amend Radioactive Materials License No. UT 23000249 and 11e.(2) Radioactive Materials License No. UT 23000478 – Request for approval revised Appendix I, *Organization*," October 6, 2006.
- (2) Shredder Facility
 - a. CD05-0448, "Radioactive Materials License No. UT 2300249 (RML) and Groundwater Quality Discharge Permit UGW450005 (GWQDP). Request to Construct Shredding Facility," September 15, 2005.

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- b. CD05-0532, "Request to Construct Shredding Facility – Revised Design and Interrogatory Response," November 14, 2005.
 - c. CD05-0556, "Request to Construct Shredding Facility – Additional Information," December 2, 2005.
 - d. CD06-0036, "Request to Construct Shredding Facility – Response to Round 2 Interrogatories", February 1, 2006.
 - e. CD06-0098, "Request to Construct Shredding Facility – Response to Round 3 Interrogatory," March 10, 2006.
 - f. ASTM F-1417, "ASTM Method F 1417-92," March 29, 2006.
 - g. CD06-0188, "Request to Construct Shredder Facility – Response to Round 4 Interrogatory," May 9, 2006.
 - h. CD06-0211, "Request to Construct Shredder Facility – Response to Round 4B Interrogatory," May 25, 2006.
 - i. CD06-0234, "Requests to Construct Shredder and Rotary Dump Facilities – Revised Wastewater Management Process," June 19, 2006.
 - j. "EnergySolutions LLC Low-Level Radioactive Waste Closure & Post-Closure Trust License UT 2300249 Trust #16673400," June 29, 2006.
 - k. CD-0346, "Interim Wastewater Management Plan for the Shredder Facility – Response to August 18, 2006, Request for Additional Information," August 31, 2006.
 - l. CD06-0388, "Radioactive Material License UT 2300429 and Groundwater Quality Discharge Permit (GWDP) No UGW450005 Shredder Facility – Request to Operate," October 5, 2006.
 - m. CD06-0407, "Comment on Proposed Amendment of Radioactive Material License UT 2300249 and Groundwater Quality Discharge Permit (GWDP) No UGW450005, October 18, 2006.
 - n. CD06-0414, "Radioactive Material License UT 2300249 and Groundwater Quality Discharge Permit No UGW450005 Shredder Facility – Submittal of Revised Drawings" October 25, 2006.
 - o. CD06-0425, "Groundwater Quality Discharge Permit No UGW450005 (GWQDP) Submittal of Revised Appendix J and K," November 7, 2006.
- (3) Rotary Dump Facility
- a. CD05-0564, "Request to Construct – Rotary Dump," December 12, 2005.
 - b. CD05-0570, "Request to Construct Rotary Dump 00 Submittal of Dose Assessment," December 16, 2005.
 - c. CD06-0086, "Request to Construct Rotary Dump Facility – Response to Round 1 Interrogatory", March 2, 2006.
 - d. ASTM F-1417, "ASTM Method F 1417-92," March 29, 2006.
 - e. CD06-0147, "Request to Construct Rotary Dump Facility – Revised Drawings," April 10, 2006.
 - f. CD06-0210, "Request to Construct Rotary Dump Facility – Response to Round 2 Interrogatory," May 25, 2006.

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- g. CD06-0211, "Request to Construct Rotary Dump Facility – Response to Round 4B Interrogatory", May 25, 2006.
 - h. CD06-0226, "Request to Construct Rotary Dump Facility – Response to Round 2B Interrogatories," June 8, 2006.
 - i. CD06-0234, "Requests to Construct Shredder and Rotary Dump Facilities – Revised Wastewater Management Process," June 19, 2006.
- (4) Intermodal Container Wash Building
- a. CD05-0291a, "Radioactive Materials License No. UT 2300249 (RML) and Groundwater Quality Discharge Permit UGW450005 (GWQDP). Request to Construct Intermodal Container Wash Building and Access Control Building," June 9, 2005.
 - b. CD05-0388, "Request to Construct Intermodal Container Wash Building – Revised Design and Supplemental Information," August 8, 2005.
 - c. CD05-0432, "Request to Construct Intermodal Container Wash Building – Revised Design and Interrogatory Response," September 1, 2005.
 - d. CD06-0110, "MARSSIM Release for New Intermodal Container Wash Facility," March 22, 2006.
 - e. CD06-0206, "Radioactive Material License UT 2300249 and Groundwater Quality Discharge Permit No UGW450005 Intermodal Container Wash Building – Request to Operate," May 22, 2006.
 - f. "EnergySolutions LLC Low-Level Radioactive Waste Closure & Post-Closure Trust License UT 2300249 Trust #16673400," June 29, 2006.
 - g. CD06-0259, "Groundwater Quality Discharge Permit (GWDP) No UGW450005 Intermodal Container Wash Building – Revised Appendix J and K," July 10, 2006
- (5) Decontamination Access Control Building
- a. CD05-0291b, "Radioactive Materials License No. UT 2300249 (RML) and Groundwater Quality Discharge Permit UGW450005 (GWQDP). Request to Construct Intermodal Container Wash Building and Access Control Building," June 9, 2005.
 - b. CD05-0367, "MARSSIM Release of New Boxwash Access Control", July 26, 2005.
 - c. CD06-0139, "Radioactive Material License UT 2300249 and Groundwater Discharge Quality Permit (GWDP) No UGW450005 Decontamination Access Control Building – Request to Operate", April 6, 2006.
 - d. "EnergySolutions LLC Low-Level Radioactive Waste Closure & Post-Closure Trust License UT 2300249 Trust #16673400," June 29, 2006.
 - e. CD06-0245, "Groundwater Discharge Quality Permit (GWDP) No UGW450005 Decontamination Access Control Building – Revised Appendix J and K and Drawing No 05015-S100," June 30, 2006.
- (6) East Side Drainage Project
- a. CD06-0175, "Request to Construct East Side Drainage and Gray Water System Modifications," May 1, 2005.
 - b. CD06-0244, "East Side Drainage and Gray Water System Modifications – Response to DRC Review," June 30, 2006.

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- c. CD06-0293, "Groundwater Discharge Quality Permit No UGW450005 East Side Drainage and Gray Water System – Revised Design and BAT Plans," August 4, 2006.
 - d. CD06-0327, "Groundwater Discharge Quality Permit No UGW450005 East Side Drainage and Gray Water System – Revised Appendix J BAT Performance Monitoring Plan and Appendix K BAT Contingency Plan," August 23, 2006.
 - e. CD06-0328, "Groundwater Discharge Quality Permit No UGW450005 East Side Drainage and Gray Water System – Revised Drawings," August 24, 2006.
- G. The following documents refer to revisions made in Revision 0 of the License Renewal Application:
- (1) AGRA Earth & Environmental, Inc. 1999. Summary Seismic Stability and Deformation Analysis: Envirocare LARW Disposal Facility, Clive, Tooele County, Utah. September 1, 1999. (1998 LRA Appendix J)
 - (2) AGRA Earth & Environmental, Inc. 2000a. Evaluation of Settlement of Compressible Debris Lifts: LARW Embankments, Clive, Tooele County, Utah. June 1, 2000.
 - (3) AGRA Earth & Environmental, Inc. 2000b. Evaluation of Settlement of Incompressible Debris Lifts: LARW Embankments, Clive, Tooele County, Utah. June 1, 2000.
 - (4) AMEC Earth & Environmental, Inc. 2000a. Letter Report: Allowable Differential Settlement and Distortion of Liner and Cover Materials. October 4, 2000.
 - (5) AMEC Earth & Environmental, Inc. 2000b. Letter Report Stability Considerations: Proposed LLRW Embankment. October 25, 2000.
 - (6) AMEC Earth & Environmental, Inc. 2000c. Letter Report Stability Considerations - Addendum: Proposed LLRW Embankment. November 8, 2000.
 - (7) AMEC Earth & Environmental, Inc. 2001. Response to Interrogatory Number 2: Placement of HICs in Caissons. October 1, 2001.
 - (8) AMEC Earth & Environmental, Inc. 2002. Placement of Large Liners in Caissons. June 19, 2002.
 - (9) Bingham Environmental. 1996. Project Memorandum HEC-1 and HEC-2 Analysis, LARW Application for License Renewal, Envirocare Disposal Facility, Clive Utah. November 26, 1996. (1998 LRA Appendix KK)
 - (10) EnergySolutions (Rebecca McCloud) to Utah Division of Radiation Control (Dane Finerfrock). 2006. Correspondence concerning corporate ownership and name changes. February 6, 2006.
 - (11) EnergySolutions (Tye Rogers) to Utah Division of Radiation Control (Dane Finerfrock). 2006. Correspondence concerning corporate ownership and name changes. February 3, 2006.
 - (12) EnergySolutions LLC. 2007. "2006 Annual 083106 Rev 052107.xls" [annual surety review], Revision 22, May 21, 2007
 - (13) EnergySolutions to Utah Division of Radiation Control. 2006. Letter number CD06-0348, Radioactive Materials License No. UT2300249 – Revision to License Condition 26, Appendix R request submitted to DRC on March 17, 2006. September 1, 2006.
 - (14) Envirocare of Utah, Inc. to URS Corporation. 2005. Personal communication via electronic mail (Sean McCandless and Robert D. Baird, PE). January 27, 2005.
 - (15) Envirocare of Utah, Inc. to Utah Division of Radiation Control. 2004. Letter number CD04-0287, Updated Specific Gravity Report and Request for Eliminating Specific Gravity Monitoring.

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June 9, 2004.

- (16) Envirocare of Utah, Inc. to Utah Division of Radiation Control. 2005. Letter number CD05-0487, Cover Test Cell Evaporative Zone Depth (EZD) Report. October 13, 2005 June 9, 2004.
- (17) Envirocare of Utah, Inc. 2000a. Pre-Licensing Plan Approval Application for a License Amendment Allowing Disposal of Class B & C Low-Level Radioactive Waste. (revision of January 5, 2000 plan) March 15, 2000.
- (18) Envirocare of Utah, Inc. 2000b. Rock Cover Design. July 26, 2000.
- (19) Envirocare of Utah, Inc. 2001. "Clive Facility Total Ditch Flow Calculations." October 30, 2001.
- (20) Envirocare of Utah, Inc. 2003c. Application for Renewal: Radioactive License Materials License Number UT-2300249. July 2, 2003.
- (21) Envirocare of Utah, Inc. 2005d. Application for Renewal: Radioactive License Materials License Number UT-2300249, Revision 2 (including all Appendices). June 20, 2005.
- (22) Montgomery-Watson (John Pellicer and Patrick Corser) to Envirocare of Utah, Inc. (Tim Orton). 2000. Letter Report LLRW Cover Frost Penetration. March 1, 2000.
- (23) Rogers and Associates Engineering for the Utah Division of Radiation Control. 2000. Siting Evaluation Report for Proposed Disposal Under URCCR R-313-25-3 of Class B & C Low Level Radioactive Waste. May 2, 2000.
- (24) Shrum, Dan to Robert D. Baird, PE, CCE (URS Corporation). 2005. Via electronic mail. February 28, 2005.
- (25) SWCA Environmental Consultants, Inc. 2000. Assessment of Vegetative Impacts on LLRW.
- (26) Tooele County Recorder. 1993. Entry No. 5489, Book 348, Page 104. March 16, 1993.
- (27) Utah Bureau of Radiation Control (Larry F. Anderson) letter to Envirocare of Utah, Inc. (Khosrow B. Semnani, President). 1987. "Radioactive Material License No. UT 2300249." November 18, 1991.
- (28) Utah Department of Environmental Quality (Diane R. Nielson, Executive Director) and Envirocare of Utah, Inc. (Khosrow B. Semnani, President). 1993. "Agreement Establishing Covenants and Restrictions." March 16, 1993.
- (29) Utah Division of Radiation Control (Dane Finerfrock) to Envirocare of Utah, Inc. (Daniel Shrum). 2007. "EnergySolutions 2006 Annual Surety Submittal, May 21, 2007 Update." June 1, 2007.
- (30) Utah Division of Radiation Control (Dane Finerfrock) to Envirocare of Utah, Inc. (Tye Rogers). 2004. "Restoration of Site Drainage." November 12, 2004.
- (31) Utah Division of Radiation Control (Dane Finerfrock) to Envirocare of Utah, Inc. (Tye Rogers). 2005a. "Response to December 4, 2004 Report - Restoration of Site Drainage: Request for Additional Information." February 23, 2005.
- (32) Utah Division of Radiation Control (Dane Finerfrock) to Envirocare of Utah, Inc. (Tye Rogers). 2005b. "Response to March 25, 2005 Envirocare Response to the February 27, 2005 DRC Request for Information - Restoration of Site Drainage." April 22, 2005.
- (33) Utah Division of Radiation Control (Dane Finerfrock) to Envirocare of Utah, Inc. (Tye Rogers). 2007. "Restoration of Grade - Round 1 Interrogatories: Notice of Upcoming Requirements and Request for Schedule." February 16, 2007.
- (34) Utah Division of Radiation Control (Loren Morton) to EnergySolutions (Tye Rogers) . 2006. Correspondence regarding "DRC Response to Eight Submittals by EnergySolutions Regarding

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- Proposed Class A Combined (CAC) Disposal Cell: Request for Additional Information, Round 3 Interrogatory." March 3, 2006.
- (35) Utah Division of Radiation Control to EnergySolutions, LLC. 2006. Letter of approval of Revision 20 of the CQA/QC Manual. September 21, 2006.
 - (36) Utah Division of Radiation Control (William Sinclair) to Envirocare of Utah, Inc. 2000. Correspondence concerning expectations in addressing the land ownership issue. March 6, 2000.
 - (37) Utah Division of Radiation Control. 2006a. Memorandum: Analysis of the December 20, 2005 Envirocare Submittal of Settlement Monitoring Plan Update. February 2, 2006. (Johnathan P. Cook to Loren Morton)
 - (38) Whetstone Associates, Inc. memorandum to Envirocare of Utah, Inc. 2000. Technical Memorandum 41010 Infiltration Through Lower Radon Barrier, Class A, B, & C Cell Cover. November 7, 2000.
 - (39) Whetstone Associates, Inc. 2000a. Revised Envirocare of Utah Western LARW [Class A] Cell Infiltration and Transport Modeling. July 19, 2000.
 - (39a) Whetstone Associates, Inc. memorandum to Envirocare of Utah, Inc. 2001. Technical Memorandum 4101M Results of Cf-251 Modeling for the Class A Cell, Using the 898-year Half Life, August 21, 2001.
 - (40) Whetstone Associates, Inc. 2001a. "Travel Time Through Class A Cell Cover." June 22, 2001.
 - (41) Whetstone Associates, Inc. 2003b. Memorandum to Dan Shrum, Envirocare of Utah, "Open Cell Modeling Results for Years 7 – 12," Technical Memorandum 4101T, August 28, 2003.
 - (42) Whetstone Associates, Inc. 2004. Revised Western LARW Cell Infiltration and Transport Modeling. July 19, 2004.
 - (43) Zion's Bank and Energy Solutions, LLC, 2007. Surety Details. March 27, 2007.
 - (44) "Envirocare's Cover Test Cell Evaporative Zone Depth (EZD) Report", Daniel B. Shrum of Envirocare of Utah, LLC to Dane L. Finerfrock of Utah Division of Radiation Control, CD05-0487, October 13, 2005.
 - (45) "Cover Test Cell Data Report Addendum: Justification to Change EZD from 18-inches to 24-inches", Envirocare of Utah, LLC, October 5, 2005.
 - (46) "October 13, 2005 Envirocare Submittal Regarding Cover Test Cell Evaporative Zone Depth (EZD) Report: CAC Cell Round 2 Interrogatory", Loren B. Morton of Utah Division of Radiation Control to Daniel B. Shrum of Envirocare of Utah, LLC, November 1, 2005.
 - (47) "Class A Combined Embankment Interrogatories: Clarification of Envirocare October 13, 2005 Evaporative Zone Depth Report", Daniel B. Shrum of Envirocare of Utah, LLC to Dane L. Finerfrock of Utah Division of Radiation Control, CD05-0518, November 2, 2005.
 - (48) "Response to DRC Letter dated November 1, 2005 in Regards to Envirocare's October 13, 2005 Evaporative Zone Depth Report", Daniel B. Shrum of Envirocare of Utah, LLC to Dane L. Finerfrock of Utah Division of Radiation Control, CD05-0520, November 3, 2005.
 - (49) "Cover Test Cell As-Built Report", Envirocare of Utah, LLC, January 24, 2002.
 - (50) Appendix N, "Cover Test Cell Monitoring Report" dated June 20, 2003, Envirocare of Utah, LLC, License Renewal Application, Revision 2, dated June 20, 2005
 - (51) Appendix G, "Drawings" variously dated, Envirocare of Utah, LLC, License Renewal Application, Revision 2, dated June 20, 2005.

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- (52) "Attachment 4: EZD Cover Test Cell Data" CD-ROM attached to "Radioactive Material License #UT2300249 and Groundwater Quality discharge Permit No. UGW450005. Class A Combined Disposal Embankment - Response to September 19, 2005 Interrogatories", Tye Rogers of Envirocare of Utah, LLC to Dane L. Finerfrock of Utah Division of Radiation Control, CD05-0574, December 16, 2005.
- (53) "HDU Data", Mike LeBaron of Envirocare of Utah, LLC to Loren Morton of Utah Division of Radiation Control and Robert Baird of URS Corporation, e-mail dated December 19, 2005.
- (54) "Cover Test Cell WCR Data", Mike LeBaron of Envirocare of Utah, LLC to Loren Morton of Utah Division of Radiation Control and Robert Baird of URS Corporation, e-mail dated December 20, 2005.
- (55) "Matric Potential Conversion Factor", Mike LeBaron of Envirocare of Utah, LLC to Loren Morton of Utah Division of Radiation Control and Robert Baird of URS Corporation, e-mail dated December 21, 2005.
- (56) "RE: Evaporative Pan Data (39400085.10300 OUT)", Mike LeBaron of Envirocare of Utah, LLC to Loren Morton of Utah Division of Radiation Control and Robert Baird of URS Corporation, e-mail dated December 22, 2005.
- (57) "Report Combined Embankment Study: Envirocare", AMEC Earth and Environmental, Inc., December 13, 2005.
- (58) "Geotechnical Study Increase in Height and Footprint: Envirocare LARW Facility Near Clive, Utah", AMEC Earth and Environmental, Inc., May 27, 2005.
- (59) "Class A Disposal Cell: Containerized Waste Facility: Engineering Justification Report", Envirocare of Utah, April 12, 2001.
- (60) "Class A Disposal Cell: Containerized Waste Facility: Engineering Justification Report: Addendum 15 Percent Void Space Criteria", Envirocare of Utah, October 2, 2001.
- (61) "Mixed Waste Embankment Engineering Justification Report" Revision 2, Envirocare of Utah, October 20, 2001
- (62) "Minimum Temperature Return Rates", personal communication from Jim Ashby, November 1, 2000.
- (63) "Review of Cover Design for LARW Cell", TerraMatrix/Montgomery Watson to Envirocare of Utah, February 5, 1998.
- (64) "Cover Test Cell As-Built Report", Envirocare of Utah, January 24, 2002.
- (65) Letter CD02-0097, "Revised CQA/QC Manual - Containerized Waste Facility: Placement of Large Liners/HICs", Envirocare of Utah to Utah Division of Radiation Control, March 18, 2002.
- (66) Letter CD02-0269, "Revised CQA/QC Manual - Containerized Waste Facility: Placement of Large Liners/HICs - Response to Interrogatories", Envirocare of Utah to Utah Division of Radiation Control, July 3, 2002.
- (67) Letter CD02-0315, "Revised CQA/QC Manual - Containerized Waste Facility: Placement of Large Liners/HICs - Revised Settlement Analysis and CQA/QC Language", Envirocare of Utah to Utah Division of Radiation Control, August 7, 2002.
- (68) Letter CD02-0339, "Revised CQA/QC Manual - Containerized Waste Facility: Placement of Large Liners/HICs - Proposed Revision 15 of the LLRW CQA/QC Manual", Envirocare of Utah to Utah Division of Radiation Control, August 26, 2002.

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- (69) Letter CD01-0212, "Engineering Justification Report - Waste Placement with CLSM", Envirocare of Utah to Utah Division of Radiation Control, May 16, 2001.
- (70) Letter CD01-0296, "Containerized Waste Facility - Placement of Class A Ion-Exchange Resins in Polyethylene HICs and Steel Liners", Envirocare of Utah to Utah Division of Radiation Control, July 5, 2001.

H. The following documents refer to revisions made in Amendment 1:

- (1) Letter CD07-0420, "RML UT2300249, Condition 58 -Request for Amendment to the Waste Characterization Plan, dated July 23, 2007.
- (2) Letter CD08-0078, "RML UT2300249, Condition 58 -Request for Amendment to the Waste Characterization Plan."
- (3) Letter CD08-0004, "RML UT2300249 Amendment for Calibration Sources" dated January 2, 2008.
- (4) Letter CD08-0066, "RML UT2300249; Request to amend License Condition 32" dated February 28, 2008.
- (5) Email dated February 29, 2008, from Boyd Imai to Mark Ledoux Re: Amendment Request (CD08-004).
- (6) Email dated November 23, 2007, from John Hultquist to Sean McCandless, Request for Information regarding WCP:
- (7) Letter dated March 7, 2008, Utah Division of Radiation Control (Dane Finerfrock) to EnergySolutions, LLC. (Sean McCandless). "Appendix I Organization dated February 28, 2008."
- (8) Memorandum from John Hultquist to File; dated March 11, 2008, Review of WCP revised November 9, 2007, and March 10, 2008.

I. The following documents refer to revisions made in Amendment 2:

- (1) Executive Secretary's letter dated May 16, 2008 [LA# 116-2008]

J. The following documents refer to revisions made in Amendment 3:

- (1) Letter CD08-0218, "Clive Transportation Hub" dated July 9, 2008.
- (2) Email dated July 28, 2008, from Mark Ledoux to Boyd Imai, "Clive cask hub."
- (3) Letter CD08-0339, Request to Amend License Conditions 10, 38, 43, and Table 40.A, dated October 21, 2008.
- (4) Letter CD08-0137, Request for Amendment to Condition 54, Site Radiological Security Plan, dated May 5, 2008.
- (5) Email dated May 6, 2008, from Mark Ledoux to John Hultquist, License condition 57 proposed changes.
- (6) Letter CD08-0111, RML UT2300249 License Condition 26, and RML UT2300478 License Condition 13.1.D Environmental Monitoring Plan, dated April 4, 2008
- (7) Letter CD08-0115, RML UT2300249 License Condition 26, and RML UT2300478 License Condition 13.1.D Environmental Monitoring Plan, dated April 9, 2008
- (8) Email dated November 13, 2008, from John Hultquist to Sean McCandless, Summary of meeting regarding the Env. Monitoring Plan.
- (9) Email dated December 11, 2008, from Sean McCandless to John Hultquist, Procedure CL-RS PR-

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120 Rev 2. Access Control Points, DRC Comment Rev.

- (10) Letter CD08-0376, RML UT2300249 License Condition 26, and RML UT2300478 License Condition 13.1.D Environmental Monitoring Plan, dated November 24, 2008
- (11) Email dated December 15, 2008, from Sean McCandless to John Hultquist, Procedure CL-RS PR-120 Rev 2. Access Control Points, Form update.

K. The following documents refer to revisions made in Amendment 4:

- (1) Letter dated January 26, 2009, (CD09-0020) from Daniel Shrum to Dane Finerfrock; Radioactive Material License No: UT230029 and UT2300478; Revision of Appendix I, *Organization*.
- (2) Letter dated January 28, 2009, John Hultquist to Dan Shrum, Request for Information, Revision to Appendix I *Organization* submitted January 26, 2009.
- (3) Letter dated February 9, 2009, (CD09-0038) from Dan Shrum to Dane Finerfrock, Revision to Appendix I *Organization*. Response to Request for Information.

L. The following documents refer to revisions made in Amendment 5:

- (1) Letter dated July 27, 2009, (CD09-0188) from Daniel Shrum to Dane Finerfrock; Radioactive Material License Number UT 2300249 - Request for Amendment.
- (2) Letter dated May 6, 2009, (CD09-0116) from Sean McCandless to Dane Finerfrock, Radioactive Material License #UT 2300249 – Request for Amendment and Response to April 15, 2009, Request for Information.
- (3) Letter dated May 28, 2009, Dane Finerfrock to Sean McCandless, 2009 Module 14 Engineering Inspection – Soil Lab and Testing Methods with accreditation for License Condition 45, Radioactive Materials License UT 2300249 Closeout Letter.
- (4) Letter dated April 7, 2009, (CD09-0091) from Sean McCandless to Dane Finerfrock Radioactive Material License #UT 2300249 and Ground Water Quality Discharge Permit No. UGW450005 - Response to DRC Request for Information
- (5) Memorandum from Dave Esser to File, dated May 21, 2009, Proposed correction to the Ground Water Quality Discharge Permit UGW45005 and Radioactive Material License UT2300249 – Amendment Review regarding section, disposal cell, and buffer zone Latitude and Longitude coordinates.

M. The following documents refer to revisions made in Amendment 6:

- (1) Letter dated October 22, 2007, (CD07-0340) from Sean McCandless to Dane Finerfrock; Radioactive Material License Number UT 2300249 - Request for Amendment to Conditions 14.B and 16.F.ii.
- (2) Letter dated November 20, 2007, from John Hultquist to Sean McCandless, Formerly Characteristic Hazardous Waste meeting, request to Amendment, Radioactive Material License #UT 2300249.
- (3) URS Memorandum dated December 10, 2007, Gary Merrell to Dane Finerfrock Review of Whetstone Technical Memorandum, "Formerly Characteristic Waste Modeling of Class A and Class A North Cells," from Susan Wyman to Dan Shrum, September 25, 2007.
- (4) Letter dated January 21, 2009, (CD09-0015) from Sean McCandless to Dane Finerfrock Formerly

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Characteristic Waste – Response to Letter dated November 20, 2007.

- (5) Letter dated January 21, 2009, (CD09-0014) Timothy Orton to Dennis Downs, Div. of Solid and Hazardous Waste, Class 2 Modification – Management of Wastes at the Mixed Waste Facility that will be disposed at the LLRW Facility.
- (6) Memorandum dated February 18, 2009, from Boyd Imai to John Hultquist, EnergySolutions Amendment Request (CD07-0340).
- (7) Memorandum dated September 21, 2009, from Boyd Imai to John Hultquist, Review; Formerly Characteristic Waste – License Amendment Request.
- (8) Letter dated August 31, 2009, Sean McCandless to Dane Finerfrock, Radioactive Material License No. UT2300249 – Revised request for Amendment – Formerly Characteristic (LLRW Destined) Waste.
- (9) Email dated October 15, 2009, Sean McCandless to John Hultquist, Formerly Characteristic, Attachments Revised RML 10/8/09 and WCP Revised 10/8/09.
- (10) Memorandum dated October 19, 2009, from Boyd Imai to John Hultquist, Formerly Characteristic Wastes – Transfer to LLRW.

N. The following documents refer to revisions made in Amendment 7:

- (1) Letter dated September 21, 2009, (CD09-0241) from Val J. Christensen to Amanda Smith; RML No. UT2300249 – Commitments Relating to Depleted Uranium Disposal.
- (2) Letter dated October 1, 2009, (CD09-0258) from Val J. Christensen to Dane Finerfrock; RML No. UT2300249 – Commitments Relating to Depleted Uranium Disposal
- (3) Notice of Agency Action to Consider Proposed License Condition No. 35 dated October 21, 2009.
- (4) Email dated February 22, 2010, from Laura Lockhart to Dane Finerfrock and John Hultquist, License Condition documents –comment response document.

O. The following document refer to revision made in Amendment 8:

- (1) Letter dated June 1, 2010, (CD10-0162) from Sean McCandless to Dane Finerfrock; RML No. UT2300249—Request for Amendment.
- (2) Letter dated July 15, 2010, (CD10-0200) from Sean McCandless to Rusty Lundberg; RML No. UT2300249—Revision of Appendix I, *Organization*.
- (3) Letter dated August 2, 2010, (CD10-0219) from Sean McCandless to Rusty Lundberg; RML No. UT2300249—Revision of Appendix I, *Organization*.
- (4) Letter dated November 1, 2010, (CD10-0298) from Rick Chalk to Rusty Lundberg; 1. Radioactive Material License UT 2300249, License Condition 16.1 (sic) Letter dated November 23, 2009 to Dane Finerfrock from Mark Ledoux, CD09-0323, 2. Administrative request from DRC to EnergySolutions to amend License UT 2300249, License Conditions 6, 7, and 8.
- (5) Email date November 18, 2010, from Thomas Brown to Boyd Imai, LC 8 E, K, M and O.

P. The following documents refer to revision made in Amendment 9:

- (1) Letter dated December 6, 2010, (CD10-0347) from Dan B. Shrum to Rusty Lunberg; RML No. UT2300249—Amendment Request – Condition 35.B, Depleted Uranium.
- (2) Memorandum dated December 13, 2010, from John Hultquist to File regarding Amendment

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request.

Q. The following documents refer to revision made in Amendment 10:

- (1) Letter dated February 24, 2011, (CD11-0045) from Dan Shrum to Rusty Lundberg; Radioactive Material License No. UT2300249, License Condition 35.B.
- (2) Letter dated February 24, 2011, from Rusty Lundberg to Dan Shrum Radioactive Material License No. UT2300249, License Condition 35.B Depleted Uranium Performance Assessment.
- (3) Letter dated March 14, 2011 (CD11-0075) from Dan Shrum to Rusty Lundberg Radioactive Material License No. UT2300249, License Condition 35.B Depleted Uranium Performance Assessment.

R. The following documents refer to revision made in Amendment 11:

- (1) Letter dated September 30, 2010, (CD10-0264) from L. Wayne Johns to Rusty Lundberg; Radioactive Material License No. UT2300249, License Condition 26, and Radioactive Material License No. UT2300478, License Condition 13.1.D Environmental Monitoring Plan.
- (2) Letter dated October 21, 2010, (CD10-0290) from L. Wayne Johns to Rusty Lundberg; Radioactive Material License No. UT2300249, License Condition 26, and Radioactive Material License No. UT2300478, License Condition 13.1.D Environmental Monitoring Plan.
- (3) Memorandum dated October 21, 2010, from Bill Craig to File; EnergySolutions request to change Appendix R.
- (4) Email dated January 25, 2011, from John Hultquist (DRC) to Sean McCandless (ES) regarding draft license and statement of basis.
- (5) Email dated January 27, 2011, from John Hultquist (DRC) to Sean McCandless (ES) responding to proposed language change to LC 60.

S. The following documents refer to revisions made in Amendment 12:

- (1) Letter dated August 2, 2011, (CD11-0183) from Sean McCandless to Rusty Lundberg; Radioactive Material License No. UT2300249, Request to Amend License Conditions 6.E, 9 and 10.
- (2) Letter dated August 17, 2011, (CD11-0224) from Sean McCandless to Rusty Lundberg; Radioactive Material License No. UT2300249, Request to Amend License Conditions 6.E, 9 and 10; Revised Request.
- (3) Letter dated August 25, 2011, (CD11-0234) Sean McCandless to Rusty Lundberg; Radioactive Material License No. UT2300249, Request to Amend License Conditions 52 and 54.
- (4) Email dated October 5, 2011, from Ryan Johnson (DRC) to Sean McCandless (ES); Request to Amend License Condition 52.
- (5) Email dated October 5, 2011, from Ryan Johnson (DRC) to Sean McCandless (ES); Request to Amend License Condition 54.
- (6) Letter dated October 13, 2011 (CD11-0282) Sean McCandless to Rusty Lundberg; Radioactive Material License No. UT2300249, Request to Amend License Conditions 52 and 54.
- (7) Letter dated October 27, 2011, from Rusty Lundberg to Dan Shrum; Radioactive Material License No. UT2300249: Division of Radiation Control's (DRC) Response to Amend License Conditions

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52 and 54, dated August 25, 2011.

- (8) Letter dated October 27, 2011, (CD11-0293) from Sean McCandless to Rusty Lundberg; Radioactive Material License No. UT2300249, Response to Inspection Report dated October 18, 2011. Radiation Safety Inspection, Containerized Waste Facility (CWF) Operations.
- (9) Letter dated November 2, 2011, (CD11-0298) from Rick Chalk to Rusty Lundberg; Radioactive Material License No. UT2300249, Request to Amend License Conditions 6.E, 9 and 10; Revised Request.
- (10) Letter dated November 7, 2011, from Rusty Lundberg to Sean McCandless; Radioactive Material License No. UT2300249: Division of Radiation Control's (DRC) Response to Amend License Conditions 39.B, dated October 27, 2011.
- (11) Email dated November 8, 2011, from Ryan Johnson (DRC) to Sean McCandless (ES); Draft Statement of Basis and Amendment #12 of Radioactive Material License UT2300249.
- (12) Letter dated November 8, 2011, (CD11-0307) from Sean McCandless to Rusty Lundberg, Radioactive Material License No. UT2300249; Revision of Appendix I, *Organization*.
- (13) Email dated November 15, 2011, from Ryan Johnson (DRC) to Sean McCandless (ES); Amendment request for LC 32.A.

T The following documents refer to revisions made in Amendment 13:

- (1) Letter dated August 2, 2011, (CD11-0183) from Sean McCandless to Rusty Lundberg; Radioactive Material License No. UT2300249, Request to Amend License Conditions 6.E, 9 and 10.
- (2) Letter dated August 17, 2011, (CD11-0224) from Sean McCandless to Rusty Lundberg; Radioactive Material License No. UT2300249, Request to Amend License Conditions 6.E, 9 and 10; Revised Request.
- (3) Letter dated November 2, 2011, (CD11-0298) from Rick Chalk to Rusty Lundberg; Radioactive Material License No. UT2300249, Request to Amend License Conditions 6.E, 9 and 10; Revised Request.
- (4) Email dated November 17, 2011, from Ryan Johnson (DRC) to Sean McCandless (ES); Amendment request to store gauges on Section 29.

U. The following documents were submitted in support of proposed Amendment #14:

- 1) AMEC Earth & Environmental, Inc. 2011. Report: Geotechnical Update Report – EnergySolutions Clive Facility Class A West Embankment, February 15, 2011
- 2) AMEC Earth & Environmental, Inc. 2011. Cover Letter – Response to Interrogatory CAW R313-25-8(4)-16/1: Seismic Hazard Evaluation, EnergySolutions Clive Facility, Class A West Embankment, Clive, Tooele County, Utah. report: Geotechnical Update Report – EnergySolutions Clive Facility Class A West Embankment, Clive, Tooele County, Utah. October 25, 2011.
- 3) AMEC Earth & Environmental, Inc. 2011. Response to Interrogatory CAW R313-25-8(4)-16/1: Seismic Hazard Evaluation, EnergySolutions Clive Facility, Class A West Embankment, Clive, Tooele County, Utah. October 25, 2011
- 4) AMEC Earth & Environmental, Inc. 2011. Response to Interrogatory CAW R313-25-8(4)-16/2: Seismic Hazard Evaluation, EnergySolutions Clive Facility, Class A West Embankment, Clive,

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- Tooele County, Utah. December 23, 2011.
- 5) AMEC Earth & Environmental, Inc. 2012. Report: Response to Interrogatory CAW R313-25-8(4)-16/3: Seismic Hazard Evaluation/Seismic Stability Analysis Update, EnergySolutions Clive Facility, Class A West Embankment, Clive, Tooele County, Utah. April 6, 2012.
 - 6) AMEC Earth & Environmental, Inc. 2012. Addendum: Additional Cyclic Softening Analysis, EnergySolutions Clive Facility, Class A West Embankment, Clive, Tooele County, Utah. May 3, 2012.
 - 7) EnergySolutions, LLC. 2011. (CD11-0123) License Amendment Request: Class A West Embankment, with Attachments 1 Through 7 and cover letter from Sean McCandless to Mr. Rusty Lundberg at Utah Division of Radiation Control dated May 2, 2011.
 - 8) EnergySolutions, LLC. 2011. (CD11-0207) Radioactive Material License #UT2300249 and Ground Water Quality Discharge Permit No. UGW450005. Amendment and Modification Request – Class A West Embankment; Correction to Letter dated July 27, 2011, to Mr. Rusty Lundberg at Utah Division of Radiation Control.
 - 9) EnergySolutions, LLC. 2011. (CD11-0295) Responses to Round 1 Interrogatories: License Amendment Request (UT2300249) for the Class A West Embankment and cover letter to Mr. Rusty Lundberg at Utah Division of Radiation Control, October 28, 2011.
 - 10) EnergySolutions, LLC. 2011. (CD11-0327) Supplemental Responses to Round 1 Interrogatories: License Amendment Request (UT2300249) for the Class A West Embankment, November 28, 2011 and cover letter to Mr. Rusty Lundberg at Utah Division of Radiation Control, November 29, 2011.
 - 11) EnergySolutions, LLC. 2012. (CD12-008) Radioactive Material License #UT2300249, Class A West - Round 2 Interrogatory Response, dated January 12, 2012.
 - 12) EnergySolutions, LLC. 2012. (CD12-0049) Radioactive Material License #UT2300249, Class A West - Response to Division Request and Round 3 Interrogatory dated February 23, 2012.
 - 13) EnergySolutions, LLC. 2012. (CD12-0065) Radioactive Material License #UT2300249, Revised CAW Well Spacing Analysis, dated March 3, 2012.
 - 14) EnergySolutions, LLC. 2012. (CD12-0075) Radioactive Material License #UT2300249 and Ground Water Quality Discharge Permit No. UGW450005, Amendment and Modification Request - Class A West Embankment: Response to Round 3 Interrogatory URCR R313-25-7(3)-04, with attachments. Letter from Tim Orton, EnergySolutions, to Mr. Rusty Lundberg, Utah Division of Radiation Control, dated March 20, 2012.
 - 15) EnergySolutions, LLC. 2012. (CD12-0093) Radioactive Material License #UT2300249 - Class A West Embankment: Class A West: Round 3 Seismic Stability Response, dated April 4, 2012.
 - 16) Email dated April 6, 2012, from Sean McCandless to John Hultquist and Robert Baird; Final Report for CAW Round 3 Interrogatory Response.
 - 17) EnergySolutions, LLC. 2012. (CD12-0095) Radioactive Material License #UT 2300249 and Ground Water Quality Discharge Permit No. UGW450005. Amendment and Modification Request – Class A West Embankment: Complete, Electronic Submittal.
 - 18) EnergySolutions, LLC. 2012. (CD12-0114) Radioactive Material License #UT2300249 - Class A West Embankment: Liquefaction Addendum, Response to DRC Comments and Suggestions and Complete Electronic Copy.

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- 19) Whetstone Associates, Inc. 2011. EnergySolutions Class A West Disposal Cell Infiltration and Transport Modeling Report, April 19, 2011.
- 20) Whetstone Associates, Inc. 2011. EnergySolutions Class A West Disposal Cell Infiltration and Transport Modeling Report, November 28, 2011.
- 21) Whetstone Associates, Inc. 2012. EnergySolutions Class A West Disposal Cell Infiltration and Transport Modeling Report, February 23, 2012.
- 22) EnergySolutions, LLC. 2012. (CD12-00185) Radioactive Material License #UT2300249 and Ground Water Quality Discharge Permit No. UGW450005 - Class A West Embankment: Clay Distortion Study Plan.

V. The following documents were submitted in support of proposed Amendment #15:

- (1) Letter (CD12-0275) dated October 24, 2012, from Sean McCandless of EnergySolutions to Rusty Lundberg of the DRC. Radioactive Material Licenses UT 2300249 and UT 2300478; Request to amend License and approve revised Appendix I, *Organization*.
- (2) Letter dated December 14, 2012, from John Hultquist of the DRC to Sean McCandless of EnergySolutions. Request for Information (RFI) for Appendix I, *Organization* Submittal dated October 24, 2012: Radioactive Material Licenses UT 2300249 & UT 2300478.
- (3) Letter (CD12-0315) dated December 19, 2012, from Sean McCandless of EnergySolutions to Rusty Lundberg of the DRC. Radioactive Material License Nos. UT 2300249 and UT 2300478: Response to Request for Information for Appendix I, *Organization*.
- (4) Letter (CD13-0033) dated February 4, 2013, from Sean McCandless of EnergySolutions to Rusty Lundberg of the DRC. Radioactive Material Licenses UT 2300249 and UT 2300478; Revised request to amend License and approve revised *Organization*.

W. The following documents were submitted in support of proposed Amendment #16:

- (1) Letter (CD12-0275) dated October 24, 2012, from Sean McCandless of EnergySolutions to Rusty Lundberg of the DRC. Radioactive Material Licenses UT 2300249 and UT 2300478; Request to amend License and approve revised Appendix I, *Organization*.
- (2) Letter (CD12-0296) dated November 30, 2012, from Sean McCandless of EnergySolutions to Rusty Lundberg of the DRC. Radioactive Material License No. UT 2300249; 2012 Annual Surety Update (Update).
- (3) Letter dated March 6, 2013, from Rusty Lundberg of the DRC to Sean McCandless of EnergySolutions. Request for Information (RFI) 2012 Annual Surety Update: Radioactive Material Licenses UT 2300249.

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- (4) Letter (CD13-0119) dated April 25, 2013, from Sean McCandless of *EnergySolutions* to Rusty Lundberg of the DRC. Radioactive Material License No. UT 2300249; Annual Surety Submittal -- Response to Additional Request for Information.
- (5) Letter (CD13-0144) dated May 16, 2013, from Sean McCandless of *EnergySolutions* to Rusty Lundberg of the DRC. Radioactive Material Licenses UT 2300249 Request for Administrative Corrections to Conditions 32.E and 76.
- (6) Letter (CD13-0238) dated August 22, 2013, from Sean McCandless of *EnergySolutions* to Rusty Lundberg of the DRC. Radioactive Material Licenses UT 2300249; Request for Minor Modifications to Conditions 22.A. and B., 31, 39.E, and 77.
- (7) Letter (CD13-0255) dated September 19, 2013, from Vern Rogers of *EnergySolutions* to Rusty Lundberg of the DRC. Radioactive Material License No. UT2300249; Revised Requests for Modifications to Conditions 22, 31, 39.E, and 77.
- (8) Email dated October 11, 2013, from John Hultquist of the DRC to Sean McCandless of *EnergySolutions*. License Amendment 16.
- (9) Email dated October 14, 2013, from Vern Rogers of *EnergySolutions* to Rusty Lundberg of the DRC. Radioactive Material License UT 2300249; Response to Proposed Amendment 16

UTAH DIVISION OF RADIATION CONTROL

Rusty Lundberg
Rusty Lundberg, Director

5/12/2014
Date

PUBLIC PARTICIPATION SUMMARY
DOCUMENTATION

RADIOACTIVE MATERIAL LICENSE UT2300249
LICENSE AMENDMENT #16

The License amendment makes changes to License Conditions 4, 22, 31, 32.E, 39.E, 43, 73.A.iii, 73.A.iv, 73.B, 76, and 77.

On May 16, 2013, EnergySolutions (ES) submitted a "Request for Administrative Corrections to Radioactive Materials License #UT2300249, conditions 32.E and 76" (CD13-0144). Originally, the Licensee had requested a change to license condition 32.E in a letter dated October 24, 2012 (CD12-0275). However at that time, the Division of Radiation Control (DRC) did not make the minor change to Condition 32.E in identifying the Corporate Radiation Safety Officer (CRSO) versus the Radiation Safety Officer as part of License Amendment #15. Both the DRC and ES agreed to make these changes during the next license amendment.

On August 22, 2013, ES submitted a request to modify License Conditions 22, 31, 39.E, and 77 (CD13-0238). The DRC reviewed the request and, in a meeting on September 4, 2013 with ES' staff, discussed and proposed revisions to the requested changes. Based on this meeting, ES submitted on September 19, 2013 (CD13-0255), additional revisions to the initial request. The DRC has reviewed the additional revisions and determined they would be adequate to meet occupational and public safety requirements¹.

In addition, based on correspondence regarding the 2013 annual surety review, the Director is proposing a revision to the language in License Condition 43. Specifically, condition 43 is under the License heading "Construction Activities" and the current language involves surety information. Therefore, for consistency, Condition 43 has been revised and language has been added to License Condition 73.A which is under the License heading "Financial Assurance/Closure." The DRC added language in License Condition 73.A for clarity purposes regarding information that is required to be submitted as part of the annual surety report.² Language for License Condition 43 stipulates funding must be provided prior to construction of clay liner between Class A and Class A North cells.

The Director has determined the changes to Condition 4, 31, 32.E, 43, 73.A.iii, and iv, 73.B, and 76 are minor, administrative in nature, provide more explicit language, do not include monitoring, or sampling, and is an increase in contingency costs affecting Surety. Changes to Conditions 22, 39.E, and 77, are determined to be a reduction in monitoring, therefore are considered major in accordance with R313-17-2, and thus a public comment period was conducted by the DRC.

¹ Amendment 16 Statement of Basis, November, 2013.

² Example – Revised 2012 annual surety report, February 20, 2014 (DRC-2014-001884).

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In conclusion, License Amendment #16 makes changes to License Condition 4, 22, 31, 32.E, 39.E, 43, 73.A.iii and iv, 73.B, 76 and 77. A summary of the proposed changes to Radioactive Materials License UT2300249, Amendment #16 and the corresponding responses to comments follow.

Summary of License Condition Changes

Changes to RML:

- 1) Added language to Condition 4 to indicate that the Radioactive Materials License (RML) UT2300249 is "Under Timely Renewal"
- 2) Condition 22 reduced the frequency of some of the routine radiological surveys from weekly to monthly and removed the rollover from the list;
- 3) Condition 31 removed the word "Acting" from the term "Acting RSO";
- 4) Condition 32.E. changed Radiation Safety Officer (RSO) to Corporate Radiation Safety Officer (CRSO);
- 5) Condition 39.E. removed the 40 mrem/hr limit and replaced it with the posting and dose limit requirements of a Radiation area and a "High Radiation Area" that are found in EnergySolutions standard operating procedures (SOPs);
- 6) Changed Conditions 43 to read: Construction of the clay liner for the Class A West (CAW) embankment between the Class A (CA) and Class A North (CAN) embankments, or receipt of waste volumes exceeding the total waste capacity of the CA and CAN embankments (minus the volumes generated during facility decommissioning) is prohibited until the Licensee funds the financial surety for decommissioning of the CAW embankment as designed and approved;
- 7) Changed language in Condition 73.A.iii. to read: Updates to the cost estimate for decommissioning the Class A West (CAW) embankment to ensure the cost estimate remains current in the event that the Director determines the Class A (CA) and Class A North (CAN) embankment must be closed as a single embankment using the approved design of the CAW embankment. The cost estimate must meet the requirements of License Condition 73;
- 8) Changed language in Condition 73.A.iv. to read: Updates to cost estimate for decommissioning the CA and CAN embankments as separate embankments using the approved designs for each separate embankment. The surety shall be based on the approved cost estimate for the CA and CAN embankments until the Director determines it is no longer feasible for the CA and CAN embankments to be closed separately. At that time, the surety shall be based on the approved cost estimate provided for License Condition 73.A.iii. The update to the cost estimate for the CA and CAN embankments must include funding to move excess materials that have been placed outside of the approved CA design to the CAN embankment, as well as all other costs associated with closing the CA and CAN embankments separately. The cost estimate must meet the requirements of License Condition 73;
- 9) Condition 73.B. changed surety contingency value from 11% to 15% based on R313-22-35-3(g) and NUREG 1757, Volume 3;

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- 10) Deleted from Condition 76: parenthetical statement “but not including any part of that Account from returns on investment”; and
- 11) Removed from Condition 77: the 40 mrem/hr limit and replace it with the posting and dose limit requirements of a “Radiation Area” and a “High Radiation Area” that are found in EnergySolutions SOPs.

Comments and Responses to Comments

Because the changes to License Conditions 22, 39.E, and 77 were categorized as a major amendment as per R313-17-2(1)(a)(i), the Division of Radiation Control (DRC) conducted a public comment period from November 14, 2013 to December 16, 2013 to receive written comments. Altogether the DRC received five comments from EnergySolutions, LLC. Each of the comments received are listed below in italics, followed by a DRC response.

Letter submitted by Sean McCandless on behalf of Dan Shrum of EnergySolutions LLC. dated December 2, 2013. A total of five different comments were included in EnergySolutions’ letter.

Dear Mr. Lundberg:

In response to an invitation for public response published by the Utah Division of Radiation Control on November 15, 2013, EnergySolutions hereby submits comments to the proposed amendment #16 to Utah Radioactive Material License #UT 2300249. EnergySolutions concurs with the proposed revisions to Conditions 22, 39.E, 73.A.iii, 76, 77, and 89.W. However, as justified below, EnergySolutions requests that the Division change Conditions 43 and 73.

EnergySolutions’ Comment # 1:

1) CONDITION 43:

Division Proposed Amendment: *Construction of the clay liner for the Class A West (CAW) embankment between the Class A (CA) and Class A North (CAN) embankments, or receipt of waste volumes exceeding the total waste capacity of the CA and CAN embankments (minus the volumes generated during facility decommissioning) is prohibited until the Licensee funds the financial surety for decommissioning of the CAW embankment as designed and approved. The Licensee shall, in the 2012 Surety submittal, provide cost estimates based on the Class A West design submitted on Drawings 10014 C01 through C06 listed in Table 2C of the GWQDP as required in License Condition 73. The Licensee shall provide surety funding as approved by the Director and as per UAC R313-25-31(4) prior to commencing construction of the clay liner in the area between the previously approved Class and Class A North embankments or by the approval of the RML Renewal for UT2300249 submitted March 6, 2013 whichever comes first.*

EnergySolutions’ Proposed Amendment: *Construction of Waste placement on the clay liner for the Class A West (CAW) embankment between the Class A (CA) and Class A*

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North (CAN) embankments, or receipt of waste volumes exceeding the total waste capacity of the CA and CAN embankments (minus the volumes generated during facility decommissioning) is prohibited until the Licensee funds the financial surety for decommissioning of the CAW embankment as designed and approved. The Licensee shall, in the 2012 Surety submittal, provide cost estimates based on the Class A West design submitted on Drawings 10014 C01 through C06 listed in Table 2C of the GWQDP as required in License Condition 73. The Licensee shall provide surety funding as approved by the Director and as per UAC R313-25-31(4) prior to commencing construction of the clay liner in the area between the previously approved Class and Class A North embankments or by the approval of the RML Renewal for UT2300249 submitted March 6, 2013 whichever comes first.

EnergySolutions' Comment: *No formal construction activities have yet been undertaken to combine the Class A (CA) and Class A North (CAN) embankments into the Class A West (CAW) configuration approved in license amendment 14. Until such time as these embankments are united, closure as separate entities is more cost effective and remains consistent with the Division's response to comments when issuing amendment 14. As recognized by the Division, the appropriate and preferred alternative for current consideration in the surety cost estimate is that of the historically-approved closure plans developed separately for the CA and CAN embankments.*

In fact, EnergySolutions notes that even after complete construction of the liner between the legacy CA and CAN embankments (as contemplated in the Division's proposed amendment), selection by an independent contractor of the optimal premature closure scenario will still likely involve separate closure of CA and CAN. This is due to the fact that clay liner construction, in and of itself, does not create an irreversible commitment to build out the full CAW configuration. Waste placement on the clay liner, on the other hand, clearly creates a more reasonable trigger for funding closure of the full CAW configuration.

Therefore, EnergySolutions considers both impractical and overly costly the Division's amendment to Condition 43 requiring the "Licensee funds the financial surety for decommissioning of the CAW embankment as designed and approved" before receiving approval to build the liner between CA and CAN. Instead, EnergySolutions suggests that the financial surety funding requirement better represent actual premature closure by an independent contractor if it is conditioned on either 1) placement of waste between the CA and CAN, or 2) receipt of waste volumes exceeding the total waste capacity of the CA and CAN embankments (minus the volumes generated during facility decommissioning).

DRC Response # 1:

The DRC drafted language regarding License Condition 43 to achieve clarity about the timing of providing financial surety for construction of the portion of the Class A West embankment joining the previously approved Class A and Class A North embankments as well as consistency with existing regulatory requirements regarding the adequacy of

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the amount of financial surety associated with disposal site closure and stabilization. Specifically, UAC R313-25-31(4) states:

The amount of the licensee's financial or surety arrangement shall change in accordance with changes in the predicted costs of closure and stabilization. Factors affecting closure and stabilization cost estimates include inflation, increases in the amount of disturbed land, changes in engineering plans, closure and stabilization that have already been accomplished, and other conditions affecting costs. The financial or surety arrangement shall be sufficient at all times to cover the costs of closure and stabilization of the disposal units that are expected to be used before the next license renewal.

Consistent with this rule, the financial surety can incorporate the costs associated with the construction of the clay liner for the Class A West embankment. The clay liner constitutes construction that combines the existing Class A and Class A North embankments and therefore must be considered as a change affecting the financial surety. The existing surety for the separate disposal embankments does not include any closure or stabilization costs associated with the Class A West clay liner. The license amendment as proposed by the DRC results in greater consistency with the need for the financial surety to be "sufficient at all times to cover the costs of closure and stabilization." Requiring the closure and stabilization funding at the time of the construction of the clay liner rather than just prior to waste placement meets the standard under R313-25-31(4).

Additionally, the following history provides context for the proposed action.

In its May 15, 2011 application for the Class A West Amendment, EnergySolutions stated: "Upon DRC approval of the Class A West embankment and associated financial surety calculations, and prior to placing waste in portions of the class west [*sic*] embankment that exceed horizontally or vertically beyond the current approved Class A and Class A North designs, EnergySolutions will amend the letters of credit necessary to ensure funding for closure and post-closure monitoring of the Class A West embankment."³ The DRC captured this language as part of the public participation process, quoting this statement in the public participation summary.⁴ The language incorporated in Amendment 14 to the RML differed from that in the application: L.C. 43 states; "The Licensee shall, in the 2012 Surety submittal, provide cost estimates based on the Class A West design submitted on Drawings 10014 C01 through C065 listed in Table 2C of the GWQDP. The Licensee shall provide surety funding as approved by the Director prior to commencing construction of the clay liner in the area between the previously approved Class [*sic*] and Class A North embankments."⁵ Staff wrote License Condition 43 based on the understanding that EnergySolutions would commence liner construction between the previously-approved Class A and Class A North embankments

³ Class A West Amendment Application, EnergySolutions, May 15, 2011, p. 51.

⁴ EnergySolutions' Class A West License Amendment Request, Public Participation Summary, DRC, November 14, 2012.

⁵ License Number UT 2300249 Amendment #14.

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to join them into the new Class A West embankment during the 2013 construction season. DRC staff also believed that commencement of liner construction would trigger funding of the surety for the construction of the combined embankments.

On November 30, 2012, the DRC received the 2012 annual surety submittal (dated December 1, 2012)⁶. The surety submittal did not contain the construction cost estimate required under License Condition 43.⁷ On March 6, 2013, near the commencement of the 2013 construction season, the DRC, in a letter of the same date, requested the omitted cost estimate and the associated funding in surety for the entire Class A West embankment.⁸ EnergySolutions responded to the DRC request by declining new funding for anything beyond the annual increment of waste anticipated to be placed on the legacy Class A and Class A North embankments. The response did not address the requested cost estimate.⁹

On July 16, 2013 representatives of EnergySolutions and the DRC met to discuss License Condition 43 and to plan a path forward.¹⁰ During that meeting, EnergySolutions committed to submit the Class A West cost estimate. The DRC committed to review the estimate, and on finding it complete, to accept it as sufficient to meet the requirement of License Condition 43. The DRC agreed to accept increments of funding for the work EnergySolutions anticipated for completing each year, until work commenced to join the legacy embankments. On August 6, 2013, Russ Topham, of the DRC staff, sent an electronic mail message to Vern Rogers of Energy Solutions asking when the DRC would receive the estimate.¹¹ In a reply on August 7, 2013, Vern Rogers indicated the estimate was forthcoming.¹² On August 29, 2013 the DRC received a summary statement of anticipated costs for constructing the Class A West embankment.¹³ The DRC accepted that estimate as satisfying the estimate portion of the requirement in License Condition 43. Negotiations and internal discussions regarding other surety-related concerns proceeded over the next three months. On November 5, 2013, the DRC sent another request for information regarding surety issues, in which the DRC informed EnergySolutions that the submitted estimate met the submittal requirement of License Condition 43.¹⁴

Benchmarking the approach the DRC has taken in the proposed amendment with what the Texas Commission on Environmental Quality has done with Waste Control Specialists can provide insight into the DRC's proposed action. EnergySolutions suggests such a benchmarking exercise in Comment #2 below. The Texas Commission on

⁶ Revised 2012 Annual Surety Report submitted February 20, 2014 (DRC-2014-001884).

⁷ 2012 LLRW Annual Surety Submittal, Radioactive Materials License UT2300249, EnergySolutions, December 1, 2012 (DRC-2012-002436).

⁸ Rusty Lundberg Letter to Sean McCandless, March 6, 2013 (DCR-2013-001955).

⁹ Sean McCandless letter to Rusty Lundberg, April 25, 2013 (DRC-2013-002070).

¹⁰ Agenda for meeting on July 16, 2013 at the DRC offices (DRC-2013-003661).

¹¹ Electronic mail message from Russ Topham to Vern Rogers, August 6, 2013 (DRC-2013-003660).

¹² Electronic mail message from Vern Rogers to Russ Topham, August 7, 2013 (DRC-2013-003659).

¹³ Letter from Vern Rogers to Rusty Lundberg, August 8, 2013 (DRC-2013-002904).

¹⁴ Letter from Rusty Lundberg to Sean McCandless, November 5, 2013 (DRC-2013-003662).

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Environmental Quality (TCEQ) has regulatory jurisdiction over the Texas Compact low-level waste disposal facility operated by Waste Control Specialists. The TCEQ requires full funding to completely build out all embankments at the time the embankments receive approval. For surety purposes, the TCEQ has defined closure of a disposal unit as "filling any remaining air space in the disposal unit and then placing a cover over the unit."¹⁵ Tonya Baker, former Assistant Division Director and Special Counsel with TCEQ, clarified in personal communication with DRC staff that "filling any remaining air space" means building the embankment to the horizontal and vertical limits approved in the plans, including the use of clean fill in place of waste material.¹⁶ Accordingly, requiring funding at the time EnergySolutions begins construction of the clay liner to join the Class A and Class A North embankment liners affords an appropriate future point to collect the surety funding and meets the intent of R313-25-31(4).

After reviewing the comment and the licensee's proposed language, the DRC has determined to retain the originally proposed text.

EnergySolutions' Comment # 2:

2) CONDITION 73.B:

<u>Division Proposed Amendment:</u>	302	Contingency	15 11 %
<u>EnergySolutions Proposed Amendment:</u>	302	Contingency	11 15-11 %

EnergySolutions' Comment: *Included in its request for information of November 5, 2013, the Division incorporates the following requirement,*

"In compliance with provision R313-22-35(3)(g) of the Utah Administrative Code, the DRC proposes to increase the contingency in stages with the first increment to 15% to take place with the 2013 surety update (due December 1, 2013), and 20% occurring with the annual surety submittal on December 1, 2014. The annual surety submittal due on December 1, 2015 would include a contingency of 25%. "

In support of their directive to increase the surety calculation's contingency multiplier from 11% to 25% in Condition 73 .B, the Division cites NRC guidance NUREG 1757 [incorporated into rule in Utah Administrative Cove [sic] R313-22-35(3)(g)], noting

"it appears that the settlement between ES and the DRC on a contingency multiplier of 11% may have not fully accounted for the above Rule requirement [NRC recommendation of NUREG-1757]."

¹⁵ Financial Assurance Report: A Report to the 83rd Texas Legislature, Texas Commission on Environmental Quality, November 2012, p. 9. (www.tceq.texas.gov/assets/public/comm-exec/pubs/sfr/109.pdf)

¹⁶ Record of Conversation, October 9, 2013 (DRC-2013-003697).

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However, NUREG-1757 does not apply to the costs of decommissioning of low-level radioactive waste facilities licensed under 10 CFR Part 61 or the equivalent Utah rules. NUREG-1757 explicitly states: "Volume 3 is intended to apply only to the decommissioning of materials facilities licensed under Title 10 of the Code of Federal Regulations (10 CFR) Parts 30, 40, 70, and 72" [emphasis added].

Since Energy-Solutions' facility is licensed under UAC R313-25 (which is the state equivalent to 10 CFR 61), NUREG-1757 is not applicable. Rather, the requirements for funding closure and decommissioning of low-level radioactive waste facilities are found in 10 CFR 61.62 and NUREG-1199.

It is true that UAC R313-22-35(3)(g) requires that "all documents submitted to the Director for the purpose of demonstrating compliance with financial assurance and recordkeeping requirements meet the applicable criteria contained in the Nuclear Regulatory Commission's document NUREG-1757." However, NUREG-1757 by its own terms is not applicable to licensed low-level radioactive waste facilities.

Under Utah law, the DRC must make a showing that application of NUREG-1757 guidance to the low-level radioactive waste facilities is necessary to protect health and the environment in the State of Utah. Specifically, Utah Code Ann. § 19-3-104(9) provides that the Radiation Control Board may not adopt rules more stringent than corresponding federal regulations for purposes of administering the program delegated by the NRC 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." Therefore, absent such a finding by the Board, NUREG-1757 guidelines cannot be required by state rule where the corresponding federal provision explicitly provides that the guidelines do not apply.

In sum, the Division has not provided any legal or factual basis for the proposed increase in the contingency multiplier, nor has it demonstrated that the existing multiplier is inadequate. Without a record underlying the Division's determination, the proposed license amendment is not legally or factually supportable.

Additionally, the Division has failed to address differences highlighted herein by EnergySolutions between the Division's interpretation of NRC's recommendation and practical examples of how NRC itself has actually implemented it with other licensees.

- 1) UMETCO Minerals, Gas Hills Uranium Tailings Site, Fremont and Natrona Counties, Wyoming.
 - a. Contingency Multiplier = 15%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 15%
- 2) Crow Butte Facility.
 - a. Contingency Multiplier = 15%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 25%
- 3) North Butte Satellite Facility.

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- a. Contingency Multiplier = 15%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 25%
- 4) Three years after the initial publication of NUREG-1757, NRC imposed significantly lower multipliers than those cited by in the Division's proposed amendment when it directly licensed EnergySolutions' 1 le.(2) Embankment.
- a. Contingency Multiplier = 15%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 15%

In further support of EnergySolutions' objection to the Division's proposed amendment to Condition 73.B, EnergySolutions also recognizes other significant differences with the Division's definition of "indirect cost multipliers" and that applied to other licensees by the Division, the Utah Department of Environmental Quality (UDEQ), and the State of Texas:

- 1) Clean Harbors Aragonite Incineration Facility.8
 - a. Contingency Multiplier = 10%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 15%
- 2) Safety-Kleen Systems, Salt Lake City, Utah.9
 - a. Contingency Multiplier = 0%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 10%
- 3) Ashland distribution, Freeport Center, Clearfield Utah.10
 - a. Contingency Multiplier = 15%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 15%
- 4) ATK Launch Systems, NIROP Facility.
 - a. Contingency Multiplier = 10%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 35%
- 5) Energy Fuels Resources (USA) Inc, White Mesa Uranium Mill2
 - a. Contingency Multiplier = 15%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 15%
- 6) Waste Control Specialists
 - a. Contingency Multiplier = 10%
 - b. Sum of all Indirect Cost Multipliers (including Contingency Multiplier) = 46.7%

As the Division is aware, Condition 73 .B requires calculation of indirect costs to "be based on the sum of all direct costs in accordance with the following values," which will total 64.75% (following the increase in Contingency Factor to 25%). Even though the Division has subsequently "disagreed with the notion of viewing the indirect multipliers in LC73 in the aggregate," the list of multipliers required by Condition 73.B were, in fact, negotiated in aggregate through a year-long comprehensive exercise involving multiple independent assessments and extensive discussions between the Division and EnergySolutions.

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As was concluded in the November 8, 2005 Division Memo,

"DRC has reviewed [EnergySolutions'] subject letter dated October 24, 2005 and also [EnergySolutions'] memo dated November 7, 2005, regarding third Party Surety initiative, and we agree with the negotiated percentages shown for each of the indirect costs, which total 49.75 percent".

The Division's proposed amendment increases the indirect multipliers contrary with NRC's own implementation for EnergySolutions and other licenses. Furthermore, the basis for Division's proposed amendment is an application of NRC guidance conflicting from its own stated purpose. Finally, the Division's proposed amendment arbitrarily increases EnergySolutions' indirect multipliers in a manner inconsistent with those imposed on other UDEQ licensees and permittees, including a direct competitor located in the State of Utah. As such, the implementation of this unsupported significant increase in Condition 73.B places EnergySolutions under a far more stringent condition than those currently imposed by NRC. Any effort to revisit a single component of the indirect multipliers must apply appropriate NRC guidance and also be consistent with its application by NRC, UDEQ, and state regulatory agencies to EnergySolutions' competitors and to other licensees and permittees.

DRC Response # 2:

As the following discussion demonstrates, the NRC regulation and guidance for waste repositories provided a philosophy and nothing more. The framework and the regulatory effort were left to the State to address.¹⁷ This is particularly relevant because the four existing commercial low-level radioactive waste disposal facilities in the U.S. are licensed by the respective host Agreement State and not the NRC. Additionally, the EnergySolutions Clive facility is unique from the other three commercial disposal facilities as it is the only site where the state, as the licensing authority, does not own the land. The Clive facility is both privately owned and operated by EnergySolutions as the licensee.

The discussion which follows serves to describe how the Radiation Control Board and the DRC have attempted to provide a uniform framework for all holders of a specific license in order to minimize the potential for burdening one licensee disproportionately in comparison to another.

¹⁷ An example illustrative of the NRC leaving to the State resolution of open issues appears in NUREG-0945, the Final Environmental Impact Statement on 10 CFR Part 61 (1981). On p. S-24 of Volume 1, the author discusses public comment on Part 61. The comments center on omissions in the Regulation. The author responds that these matters "are a matter to be worked out between the site owner (i.e., the state or federal government) and the licensee...." Although not addressing the issues in this Public Participation Summary, this example demonstrates that the NRC has expected the State to identify and fill omissions in the Regulations. NUREG-1200, p. 10.2-9 includes the following: "No regulatory guides apply to the review of an applicant's financial assurance mechanisms." In the case confronted in this Public Participation Summary, the omission was a method to determine the amount of financial assurance to require of the licensee and a set of criteria to include in the financial instruments used to secure the financial assurance.

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In conjunction with other relevant portions of 10 CFR, the DRC evaluated the regulatory framework provided in 10 CFR 61. This review revealed that the framework the NRC had proposed for some segments of the radiologic and nuclear community provided robust protection, while other sectors were left overly general or broad. For example, the federal regulations lack the specificity in calculating and determining the required cost estimates for closure and post-closure of a low-level waste disposal site. NRC requirements addressing surety for waste disposal facilities appear in 10 CFR 61.62.¹⁸ The language in 10 CFR 61.62 provides a requirement to establish a surety, but provides no detail.

The other document addressing waste disposal is NUREG-1199. This guidance provides assistance in determining acceptable surety instruments, but is silent on a methodology for determining the dollar amount of the surety. NUREG-1199 refers the reader to a document titled *Funding Assurances for Closure, Postclosure, and Long-Term Care of a Low-Level Waste Disposal Facility*.¹⁹ That document is not available on the NRC website, and when asked on February 26, 2014, a specialist in the NRC document repository was unable to locate a copy of the document.

NUREG-1199 was published in January, 1991. The DRC could not find data on surety practices for low-level waste activities for that time period. However, the history of surety performance in the area of uranium mills and mill tailings sites provides the closest analogue to low-level waste disposal available to the DRC. Shortly after publication of NUREG-1199 the NRC scaled back its efforts to amend the low-level waste regulatory framework and guidance “because the NRC had a regulatory framework in place sufficient to review a 10 CFR Part 61 license application³³ and the Commission had relinquished its licensing authorities to those host states with a lead role in developing new commercial LLW disposal facilities.”²⁰ No new surety guidance has emerged from the NRC since publication of NUREG-1199 for low-level waste. This leaves the State with the responsibility to supplement the generic comments made in NUREG-1199 and 10 CFR 61.62 with what it determines will provide adequate financial protection to the taxpayer in the event of licensee failure and financial default.

The low-level radioactive waste industry history contains too little data to gauge the effectiveness of the NRC surety policy in NUREG-1199 and 10 CFR 61.62. The closest comparisons come from experience under the Uranium Mill Tailings Remedial Action program (UMTRA). An examination of the Moab, Utah UMTRA site closure effort reveals a surety budget of \$6.5 million and an expected expenditure of \$924 million (current dollars).²¹ The surety policy and practice of the NRC resulted in a surety two orders of magnitude too low to close the site. The mill suspended production in 1984, and underwent decommissioning activities between 1988 and 1998, when the owner, Atlas

¹⁸ <http://www.nrc.gov/reading-rm/doc-collections/cfr/part061/part061-0062.html>

¹⁹ NUREG-1199, p. 10-2.

²⁰ NUREG-1853 p. 29

²¹ Electronic mail from Don Metzler to Russ Topham, February 26, 2014.

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Corporation, declared bankruptcy.²² The 1998 bankruptcy occurred seven years after publication of NUREG-1199. Experiences like this led to reworking the NRC regulatory framework and guidance library for uranium mills, including the production of NUREG-1727 and, later, NUREG-1757.

If NRC used the same policies and procedures as a foundation for low-level waste regulation and guidance as it used for uranium mill sites, the results for low-level waste sureties could mirror those for uranium mills. The documents EnergySolutions asks that the DRC consult with respect to the surety date from that era, and, as discussed above, provide too little detail to guide the calculation of a complete surety.

To reduce discretion to provide direction lacking in 10 CFR 61.62, along with providing consistency in regulating compliance with financial assurance requirements and to reasonably safeguard against an insufficient surety, the DRC evaluated a number of options, ultimately determining the need to provide a uniform approach to all holders of specific licenses. Contrary to one of the arguments EnergySolutions puts forward in the comment above, namely, that NUREG-1727 only applies to an 11e.(2) byproduct material disposal site, and does not apply to a low-level waste disposal site, R313-22-35(3)(e) clearly requires all licensees who desire to possess and use radioactive materials comply with applicable NUREG-1727 financial assurance requirements. These regulatory objectives were achieved by the Radiation Control Board incorporating NUREG-1727 into rule at R313-22-35(3)(e). The Radiation Control Board considered this rule change at its meeting on October 3, 2003.²³ The DRC sought public comment for the period from November 1 through December 1, 2003.²⁴ The DRC received no comments from the public or the regulated community during the public comment period. Consequently, the Radiation Control Board adopted the rule changes and set an effective date of December 12, 2003.

The rule as originally adopted read as follows: "Applicants for a specific license authorizing the possession and use of radioactive materials in sufficient quantities that require financial assurance and recordkeeping for decommissioning under Section R313-22-35 shall assure that all documents submitted to the Executive Secretary for the purpose of demonstrating compliance with financial assurance and recordkeeping requirements meet the applicable criteria contained in the Nuclear Regulatory Commission's document NUREG-1727, 'NMSS Decommissioning Standard Review Plan' (9/2000)."²⁵ This language makes clear that, notwithstanding the original intent of the guidance, the Radiation Control Board intended holders of a specific license to comply with this requirement if the licensee had to provide financial assurance. This action addressed the need for uniformity over the regulated community (which

²² Evaluating the Lifecycle Costs of Yellowcake Production at, and Remediation of the Moab, Utah, Site Donald R. Metzler, September 21, 2011, pp. 1-2.

²³ Radiation Control Board Agenda, October 3, 2003. (DRC-2003-001021)

²⁴ Receipt from Newspaper Agency Corporation and attached documents, November 1, 2003. (DRC-2003-001022)

²⁵ R313-22-35(3)(e), as adopted December 12, 2003.

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uniformity EnergySolutions seeks in its comment) and the need for coverage where the federal regulatory framework lacked specificity or sufficiently robust language. The DRC demonstrated a legitimate need, and followed prescribed legal processes in the initial implementation of the rule.

Following the 2003 Radiation Control Board's adoption of NUREG-1727 in R313-22, the NRC updated a number of its documents and regulations. Relevant to this case, the NRC updated and revised NUREG-1727.²⁶ The Radiation Control Board initiated a rulemaking process to amend R313-22 to update the reference to the new NRC guidance document.²⁷ Representatives of EnergySolutions attended the board meeting at which the Board approved the proposed Rule change and directed the DRC staff to take the proposed Rule change to public comment.²⁸ This proposed rule change appeared in the September 1, 2006 edition of the *Utah State Bulletin* under Request #28922. In addition to the public notice in the newspaper²⁹, the DRC sent a mailer to those affected by the rulemaking action, including a company official of EnergySolutions.³⁰ No comments were received, and the Board adopted the proposed rule changes at its October 6, 2006 meeting.³¹

As described above, the adoption of NUREG-1757 in R313-22-35(g)(3) is not more stringent than corresponding federal rules. Federal rules provide insufficient guidance about how financial assurance requirements will be met, leaving regulatory decision makers with wide discretion within a broad range of appropriate actions they can take. Adoption of NUREG-1757 provides an interpretation that is within that broad discretion, providing more precise guidance for regulated entities and regulators about how that discretion will be exercised. There is no requirement in NUREG-1757 that would not be within the acceptable range of the Director's discretion had NUREG-1757 not been adopted and the imprecise requirements of the rule as it was before still stood.

EnergySolutions' reliance on the stringency provision in Utah Code Ann. § 19-3-104(8) is misplaced. The federal regulation governing surety for low-level waste facilities is 10 CFR § 61.62. It provides only broad guidance with respect to the appropriate amount of the surety:

- (a) The applicant shall provide assurance that sufficient funds will be available to carry out disposal site closure and stabilization, including: (1) Decontamination or dismantlement of land disposal facility structures; and (2) closure and stabilization of the disposal

²⁶ NUREG-1757, Volume 3, p. iii.

²⁷ Notice of Proposed Rule Amendment filed August 14, 2006. (DRC-2006-001041)

²⁸ Minutes of the Utah Radiation Control Board, August 4, 2006. (DRC-2006-001044)

²⁹ Letter from Dane L. Finerfrock to Lynn Valdez [Newspaper Agency Corporation], August 30, 2006. (DRC-2006-001046)

³⁰ Letter from Dane Finerfrock, August 30, 2006, including distribution list. (DRC-2006-001042)

³¹ Radiation Control Board, Final Agenda, October 6, 2006 (including Rulemaking Board Action Item summary). (DRC-2006-001045)

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site so that following transfer of the disposal site to the site owner, the need for ongoing active maintenance is eliminated to the extent practicable and only minor custodial care, surveillance, and monitoring are required. These assurances shall be based on Commission-approved cost estimates reflecting the Commission-approved plan for disposal site closure and stabilization. The applicant's cost estimates must take into account total capital costs that would be incurred if an independent contractor were hired to perform the closure and stabilization work.

- ...
- (d) The amount of surety liability should change in accordance with the predicted cost of future closure and stabilization. Factors affecting closure and stabilization cost estimates include: inflation; increases in the amount of disturbed land; changes in engineering plans; closure and stabilization that has already been accomplished and any other conditions affecting costs. This will yield a surety that is at least sufficient at all times to cover the costs of closure

Federal regulators are free to interpret that provision, using orders, anywhere within the broad range of discretion that provision grants.

For a number of reasons, the Radiation Control Board decided not to leave questions of interpretation to the Director's discretion. Instead, it limited that discretion by requiring the use of NUREG-1757. This limitation is not more stringent than federal regulations. The requirements of the NUREG are within the range of actions that could be required of a licensee under the broad discretion granted in 10 CFR § 61.62.

The DRC also notes that a person alleging that a rule is outside of the agency's authority must first submit comments during the public comment period and must then bring a complaint within six months of the rule's effective date. For a rule that is older than six months, they must first submit a request for rulemaking. See Utah Code Ann. § 63G-3-602(2) and (3). ES neither submitted comments during the public comment period for R313-22-35(3)(g) nor filed a request for rulemaking. These requirements are important. They allow the policy-maker, in this instance the Radiation Control Board, to consider the concern, consider their reasons for proposing or making the rule in the first instance and then make the appropriate policy decision, as it has been statutorily charged to do. The Board may decide to change a rule to be in conformance with a federal rule, or may decide to meet demonstrated health and safety concerns by changing the rule in conformance with the procedures in Utah Code Ann. § 19-3-104(9)(a). The Radiation Control Board may also disagree with the commenter, and make a determination that a rule is not more stringent than the corresponding federal regulation, a determination that could be challenged under the Utah Administrative Rulemaking Act. These are the only procedures for addressing questions in existing rules about stringency; the agency does not have the authority to ignore promulgated rules.

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EnergySolutions cites a number of instances where it claims other regulated entities receive different treatment with respect to the contingency line item than the DRC has proposed. To address this, a consideration of industry standard provides a good starting point. NUREG-1727 required a contingency of 25 percent of all costs.³² That recommendation carried through to NUREG-1757.³³ NUREG-1757 further discusses the basis for the 25% contingency as “reasonable assurance for *unforeseen* circumstances that could increase decommissioning costs, and should not be reduced or eliminated simply because foreseeable costs are low [emphasis in the original].” Then NUREG-1757 refers to “analysis and guidance contained in NUREG/CR-6477, which applies a 25 percent contingency factor to all estimated costs associated with decommissioning various reference facilities.”³⁴ Additionally for comparative purposes, NRC guidance for mill tailings sites, states: “The staff currently considers a 15 percent contingency to be an acceptable minimum amount.”³⁵

RSMeans cites a range of contingency values for different degrees of project development, with the contingency set at 25 percent for concept plans, 20 percent for schematic plans, 15 percent for design development drawings, and 8 percent for final working drawings (bid-ready plan sets).³⁶ With the contours evolving on a daily basis at the site, the state of plan development is necessarily general. Thus, the recommended contingency would tend to reflect a lower level of plan development, 20 to 25 percent.

NUREG-1757 introduces the idea of setting aside funding for corrective actions, and identifies the contingency line item as the appropriate place to capture those that cannot be predicted.³⁷ This rationale takes on additional importance when dealing with the potential for environmental releases.

The Department of Energy has provided important insights into cost estimating that bear on this discussion. “When estimating the cost of a project or program, the estimator needs to know more than a quantity and a price for that quantity to develop an all-inclusive (or good) estimate. When developing an estimate, the estimator is producing a cost estimation package. This package consists of the estimate, the technical scope, and the schedule, all of which should be cross referenced to ensure that they are consistent. This package establishes a baseline document for the project or program at its onset.”³⁸ The cost estimates the DRC reviews contain a high degree of precision, but that precision reflects a number of assumptions about the contours of the project. Those contours change daily. The accuracy of the estimate is not what it could be if the facility were no longer operating. With the ambiguity inherent in forecasting what the estimate should

³² NUREG-1727, p. 15.7.

³³ NUREG-1757, Volume 3, Rev. 1, p. 4-10.

³⁴ NUREG-1757, Volume 3, Rev. 1, p. A-29

³⁵ NUREG-1620, p. C-4.

³⁶ Facilities Construction Cost Data, RSMeans, 2008, p. 9.

³⁷ NUREG-1757, Volume 3, Rev. 1, p. A-191.

³⁸ Cost Estimating Guide, Chapter 2, p. 201, DOE G 430.1-1, www.directives.doe.gov/directives/0430.1-EGuide-1-Chp02/view.

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cover, and in the absence of a stable plan set and well-developed project schedule, the estimate should be treated as reflecting a concept plan, regardless of the precision used to generate the estimate.

ASTM International has generated standards for the construction industry. ASTM E2168 defines the terms *contingency* and *allowance*. ASTM E2168 Section 5.2.1 defines *allowance* as “A sum of money that is intended to be spent on the planned scope of work. Used in the absence of precise knowledge, and estimated, to the best of one’s abilities, to ensure a full and complete estimate. Allowances cover events and activities that are normally internal and so are directly controllable within the project plan.” Examples include mobilization, profit, environmental remediation, and regulatory oversight. Section 5.2.2 defines *contingency* as “A sum of money that is provided to cover the occurrence of unintended departures from the planned scope of work. Used in the absence of precise knowledge, and estimated, to the best of one’s knowledge, to ensure that a financial buffer is available within a budget. Contingencies assist in mitigating the effects of unplanned events and other risks that are external to, and are not directly controllable within, a project plan.” The only line item in the current surety that meets this definition of contingency is the contingency line item. Although not explicitly cited in the referenced documents, all NRC documents referenced in this Public Participation Summary follow this convention in usage of the term *contingency*.

ASTM E1946 presents a range of contingency values for varying degrees of plan development. This standard recommends from 7 percent contingency for plans of the highest order of comprehensiveness (bid ready) to 25 to 35 percent for concept plans.

EnergySolutions cited NRC treatment of four facilities as precedent for the DRC to consider when evaluating the contingency line item. Those include UMETCO Minerals, Gas Hills Uranium Tailings Site, Fremont and Natrona Counties, Wyoming; Crow Butte Facility; North Butte Satellite Facility; and, EnergySolutions’ 11e.(2) Embankment prior to DRC involvement. These facilities except for ES 11e.(2) are outside Utah’s jurisdiction and no documentation was provided to support the contingency multiplier. The DRC should model its approach after industry standard, informed by experience, rather than accepting exceptions to the cited standards as the norm. The DRC does not accept these examples as industry standards, especially when there is limited information provided in support of the cited examples.

EnergySolutions cited state treatment of four facilities not involved in the DRC program as benchmark cases. These include Clean Harbors Aragonite Incineration Facility; Safety-Kleen Systems, Salt Lake City, Utah; Ashland distribution, Freeport Center, Clearfield Utah; and, ATK Launch Systems, NIROP Facility. These facilities are not sufficient comparisons for low-level waste disposal, because they are governed under a different set of Federal Regulations (i.e. 40 CFR versus 10 CFR). The commenter provided no documentation and details on how the contingency values were established.

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EnergySolutions cited the DRC treatment of Energy Fuels Resources (USA) Inc., White Mesa Uranium Mill. The information EnergySolutions cited is out of date. The contingency line item is 20% in the 2013 surety, and is scheduled to go to 25% in the 2014 surety, and other multipliers are being revisited.³⁹

EnergySolutions cited the example of the surety for Waste Control Specialists (WCS) as approved by the Texas Commission on Environmental Quality. In addition to the 10 percent contingency cited, the TCEQ required a corrective action line item based on modeling of hypothetical releases following a theoretical liner breach. That allowance was set at \$25.9 million on a closure budget of \$81.6 million, or 31.7% of direct costs.⁴⁰ EnergySolutions has no such requirement.

On November 8, 2005, following a period of negotiation, the DRC and EnergySolutions' predecessor, Envirocare of Utah, reached agreement on a basic framework for the low-level and 11e.(2) surety cost estimates.⁴¹ It is unclear why this agreement does not reflect the requirement of R313-22-35(3)(g) to use NUREG-1757, Volume 3, as the basis for the surety documents. The referenced agreement addresses budgetary allowances, or line items for known needs, and that the project manager would expect to spend in order to complete a successful project. Examples include mobilization and demobilization, DEQ oversight of the project, management and legal expenses, and engineering support, among others. In the 2005 agreement, these total 38.75% of direct costs. By comparison, the environmental remediation line item that TCEQ requires of WCS calculates to 31.7% of direct costs, and is an example of an allowance that the DRC has yet to require of EnergySolutions. The 2005 agreement details a contingency allowance for unforeseen and unforeseeable conditions or events set at 11% of direct costs.

Each of these allowances constitutes a discrete budget activity within the total project budget, and should receive scrutiny on its own merits. Upon identifying unaddressed needs in one of these overhead multipliers or the need to add a new item to the budget, the surety reviewer needs the flexibility to ask for adjustment of that multiplier without the necessity of decreasing another budgetary allowance to compensate. For example, increasing the contingency allowance from 11% to 25% to meet the requirement of the rule and to align with industry standards should not require reduction in the remaining line items to keep the total of indirect cost multipliers constant. Keeping the total of the indirect cost multipliers constant could result in totally eliminating required funding for engineering support, management activities, and regulatory oversight.

EnergySolutions cites the sum of the indirect multipliers as excessive. Research in the construction industry does not support this opinion. For example, one researcher states, "When indirect costs are compiled as described [earlier in this report], they represent a

³⁹ Letter from Rusty Lundberg to Jo Ann Tischler, October 17, 2013. (DRC-2013-003668)

⁴⁰ Financial Assurance Report: A Report to the 83rd Texas Legislature, Texas Commission on Environmental Quality, November 2012, p. 8. (www.tceq.texas.gov/assets/public/comm-exec/pubs/sfr/109.pdf)

⁴¹ Letter from Dane L. Finerfrock to Tye Rogers, November 8, 2005. (DRC-2005-001021)

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sizeable amount of the total bid – typically on the order of 70% of the direct costs when profit is included.”⁴² In all fairness, the cited paper deals with the tunneling industry, but the analysis also limited itself to bid-ready plan sets and the bids generated therefrom. Data on the nuclear industry is not plentiful, and this type of analysis was not encountered in a recent DRC literature search.

EnergySolutions cites negotiations concluded in 2005 over the individual and total indirect cost multipliers. Every year, EnergySolutions refines its approach to the surety and asks the DRC for adjustments. The DRC has chosen to revisit the assumptions used and the conclusions reached in previous talks. The DRC found the information presented in the preceding analysis compelling enough to revisit these issues, and has asked EnergySolutions for adjustments.

The preceding analysis demonstrates that the changes the DRC has incorporated results in bringing the surety requirements into compliance with UAC R313-22-35(3)(g) and closer in alignment to industry standards. These changes are consistent with the DRC’s approach with other licensees. The process is ongoing, but the DRC has attempted to set a common direction, which, when the process concludes, will see all holders of Specific Licenses that require financial assurance and recordkeeping for decommissioning under Section R313-22-35 held to the same standards.

Therefore, the Director concludes the contingency shall be set as proposed at 15% as a step toward an eventual contingency of 25% in License Condition 73. B.

EnergySolutions’ Comment # 3:

3) CONDITION 73.C:

As currently Licensed: *RS Means Guide estimates of direct construction costs provided in the annual report shall be derived from or based on the most recent edition of the RS Means Guide for Heavy Construction.*

EnergySolutions’ Proposed Amendment: *Individual direct unit costs shall be based on either: (a) site-specific bids or data from within the previous 5 years; or (b) the most recent annual hardcopy RS Means Guide for Heavy Construction. If RS Means estimates of direct construction costs are used, they shall be adjusted in accordance with RS Means methods using the nearest applicable City Cost Index. ~~RS Means Guide estimates of direct construction costs provided in the annual report shall be derived from or based on the most recent edition of the RS Means Guide for Heavy Construction.~~*

EnergySolutions Comment: *In an effort to balance protection of taxpayers from having to unfairly shoulder the financial burden for premature closure of defunct licensed*

⁴² Overhead and Uncertainty in Cost Estimates: A guide to Their Review, John M. Stolz, P.E., p. 5. http://www.jacobssf.com/images/uploads/10_Stoltz_Uncertainty-in-Cost-Estimates_NAT.pdf.

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facilities and the unbearable monetary condition created by setting arbitrarily high surety burdens for licensees, NRC very specifically instructs licensees that their surety calculations should include,

"a detailed site-specific [emphasis added] cost estimate for decommissioning, based on the costs of an independent contractor to meet the criteria for unrestricted use in 10 CFR 20.1402."

This guidance is also reflected in Regulatory Guide 1.202, wherein NRC notes it is important that the financial instrument be "site-specific"

It is a common NRC-accepted industry practice employed by independent contractors to develop site-specific cost estimates through the application of RS Means' City Cost Index adjustments to generic National Average unit costs. Examples of NRC's concurrence with the use of this practice are seen in approved surety estimates provided by:

- 1) Rio Tinto - Sweetwater.*
- 2) Maine Yankee Independent Spent Fuel Storage Facility.*
- 3) Yankee Rowe Independent Spent Fuel Storage Facility.*

While not a specific revision as part of the proposed amendment 16 to the License, the Division informed EnergySolutions that it would not be allowed to consider site specific costs developed through the application of published City Cost Indexes to national average unit rates from RS Means. The Division directed that EnergySolutions:

"adjust the surety... using the RS Means 2013 National Average."

As justification for this directive, the Division stated,

"The following request is designed to meet the intent of the rule, to bring current practice in line with industry standard... and to avoid the necessity of public hearings and Board action to effect a variance to Rule" [emphasis added]

However, in the referenced directive, the Division is arbitrarily treating EnergySolutions more stringently than a competing facility that they also regulate. Division staff reports that the Energy Fuels Resources (USA) White Mesa Uranium Mill is permitted to use local economic data to derive a site-specific cost estimate, rather than using the R.S. Means national average.

Thus, there are four lines of evidence in support of applying the City Cost Index adjustment:

- 1) there is no supporting regulatory requirement for only using generic National Average unit costs,*

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- 2) *the use of site-specific City Cost Index adjustments is a practice commonly allowed by NRC for their licensees,*
- 3) *the common industrial use of City Cost Index-adjusted RS Means generic national average costs more closely mirrors third party services being utilized by EnergySolutions for current cover and liner construction projects,*
- 4) *the Division permits a competing facility to apply similar local cost adjustments to the RS Means national average*

Nonetheless, the Division cited its "preference to use the RS Means National Average rather than the Salt Lake City index" in denying EnergySolutions petition for their use to satisfy requirements for the generation of site-specific cost estimates. This "preference" is not supported by law, regulation, or demonstrated practical necessity.

*In fact, in the highly unlikely event that the Division were forced to oversee the premature closure of EnergySolutions' CAW Embankment, it is obvious that the Division would require qualified third-party contractors to provide "site-specific" cost estimates for necessary services. As such, it is unreasonable to assume the Division would seek to secure services from contractors who only provided bids based on generic estimates and nonspecific multipliers (as high as 64.75%) of average unit costs. Successful completion of these construction activities illustrates that the Division's proposed amendment of increasing the cumulative indirect multipliers up to 64.75%, in fact, **do not** "bring current practice in line with industry standard."*

The Division denies EnergySolutions' application of City Cost Indexes contrary with DRC's implementation for other licenses. Furthermore, no basis is provided by the Division for its denial and is given in a manner inconsistent with those imposed on other UDEQ licensees and permittees, including a direct competitor located in the State of Utah. As such, the denial places EnergySolutions under a far more stringent condition than those currently practiced by NRC. Therefore, EnergySolutions proposes amendment to Condition 73.C.

DRC Response # 3:

EnergySolutions requests the DRC use the City Cost Index for Salt Lake City within RSMMeans to establish unit costs for labor. As discussed in the following paragraphs, the DRC has required the use of the national average cost tables within RSMMeans because the remote location of Clive from Salt Lake City gives rise to concerns that performing the work at Clive may require more compensation for labor than for the same services in Salt Lake City. The same reasoning holds for procurement of equipment and supplies. The DRC remains open to using the City Cost Index if EnergySolutions presents data demonstrating adequately that the costs are equivalent in the two locations.

As described in this response, DRC has the authority without EnergySolutions' suggested license amendment to take the approach EnergySolutions proposes if that approach is

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justified. At this time, no information has been presented to justify the approach, and it is inappropriate to adopt that approach without justification.

EnergySolutions cites the language in 10 CFR 20.1402 that licensees should build surety cost estimates on "a detailed site-specific cost estimate" for decommissioning, based on the costs of an independent contractor to meet the criteria for unrestricted release.⁴³ EnergySolutions has presented this argument repeatedly over a number of surety review cycles, both with the Low Level surety and the 11e.(2) surety, most recently with the 2013 11e.(2) surety submittal.

In Comment #2 above, EnergySolutions cited negotiations in 2005 between the DRC and Envirocare of Utah (now EnergySolutions) regarding individual cost estimate adjustments. Those negotiations established as the standard for setting unit prices in the surety estimate the national average as contained in the RSMeans Facilities Construction Cost Index.⁴⁴ This is the same standard the Utah Division of Solid and Hazardous Waste requires in surety estimates for RCRA sites. EnergySolutions is seeking to deviate from that agreement in favor of the City Cost Index for Salt Lake City within RSMeans. The DRC opposed implementing the city cost index on the grounds that Clive was too remote from Salt Lake City for the City Cost Index to apply.⁴⁵ Labor costs, for example, are likely to be more than in Salt Lake City because there is no local labor pool and Wasatch Front workers may be unwilling to spend the unreimbursed travel time to come to the Clive site.

The RSMeans data set includes data for over 700 metropolitan areas. The City Cost Index was designed to provide comparison between cities and regions, and that "a City Cost Index is a percentage ratio of a specific city's cost to the national average cost of the same item at a stated time period."⁴⁶ The data set includes values for Salt Lake City, but not for Clive. To use Salt Lake City values for Clive would require a demonstration that the costs at the two locations are equivalent. EnergySolutions has yet to provide the supporting data the DRC needs to make an informed decision that the costs in the Salt Lake City metropolitan area equate to those 80 miles west, in a remote desert location. The methodology spelled out in the RSMeans literature provides a means of comparing two locations for which a City Cost Index exists, and a comparison between a location where a City Cost Index exists and the national average.⁴⁷ No method is presented to do as EnergySolutions proposes.

In its 2013 11e.(2) surety submittal, EnergySolutions again proposed implementing the Salt Lake City cost index for the estimate at the Clive facility. The DRC has consistently maintained that if EnergySolutions could demonstrate equivalence between the unit prices for Clive and Salt Lake City, the DRC would consider the data presented and make

⁴³ 10 CFR 20.1402.

⁴⁴ Letter from Dane L. Finerfrock to Tye Rogers, November 8, 2005. (DRC-2005-001021)

⁴⁵ Memorandum from Johnathan Cook to Loren Morton, July 20, 2007. (DRC-2007-001361)

⁴⁶ Facilities Construction Cost Data, RSMeans, 2008, p. 1248.

⁴⁷ Facilities Construction Cost Data, RSMeans, 2008, p. 1248-1249.

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a determination based thereon. EnergySolutions has not provided such data, but has attempted to adjust the Salt Lake City values through the use of a “mobilization factor” that has not been documented. Since no city cost index exists for Clive, and the translation of Salt Lake City values to Clive has not been demonstrated, the DRC has maintained the same posture it had in 2005, that the national average must be used.⁴⁸ In its comment, EnergySolutions has repeated its argument that “the common industrial use of City Cost Index-adjusted RSMMeans generic national average costs more closely mirrors third party services being utilized by EnergySolutions for current cover and liner construction projects.” The DRC remains open to considering the data behind this assertion once it has been submitted for review. Until then, absent a means of identifying “site-specific” costs, the DRC must rely on a conservative approximation. RSMMeans National Average provides just such an opportunity.

EnergySolutions cites unequal treatment in the case of the Energy Fuels Resources White Mesa Mill, in Blanding. That mill is six miles outside of Blanding, where local data has been acquired that reflects the local economy. The DRC required three data sources to be considered, and the highest of the three to be used.⁴⁹ Again, the distances between the facilities and the city or town closest to each are drastically different. The DRC remains open to considering data that can establish a correlation between the Salt Lake City index in RSMMeans and Clive.

EnergySolutions cites NRC treatment of three sites: Rio Tinto – Sweetwater, near Rawlins, Wyoming; Maine Yankee Independent Spent Fuel Storage Facility, near Bath, Maine; and, Yankee Rowe Independent Spent Fuel Storage Facility, near Greenfield, Massachusetts. The Sweetwater facility is 40 miles from Rawlins, Wyoming. The Rawlins Census Collection District had a population of 11,065 in 2010,⁵⁰ and is heavily dependent on construction and mining for its economy. The DRC has no information that might indicate whether these or other factors entered into the NRC’s decision to use the city cost index from Rawlins. The Maine Yankee facility is eight miles from Bath, Maine. Bath had a population of 8,514 in 2010.⁵¹ Yankee Rowe is 29 miles from Greenfield, Massachusetts, which had a 2010 population of 17,465.⁵² Clive, Utah is 79 miles from the Salt Lake City Census Collection District, 2010 population of 932,320.⁵³ EnergySolutions has not shown how these situations compare. The potential for the DRC to contract with a third party that requires a commute of 90 minutes, one way, in order to work at a location that does not have the same level of available services that would exist in a major metropolitan area bears further investigation in order to evaluate the merits of using a City Cost Index.

⁴⁸ Letter from Rusty Lundberg to Sean McCandless, November 6, 2013. (DRC-2013-003894)

⁴⁹ Memorandum from Russell J. Topham, P.E. to Phil Goble, August 30, 2012. (DRC-2012-001943)

⁵⁰ Census.gov/popfinder.

⁵¹ IBID.

⁵² IBID.

⁵³ IBID.

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Please see Response to Comment #2 to the extent EnergySolutions is claiming a violation of Utah Code Ann. § 19-3-104(9)(a).

After reviewing the comment and the licensee's proposed language, the DRC has determined there is no reason to change the language in Condition 73.C.

EnergySolutions' Comment # 4:

4) CONDITION 73.B (#301):

As currently Licensed:

B. Indirect Costs shall be based on the sum of all direct costs in accordance with the following values:

<i>Surety Reference No.</i>	<i>Description</i>	<i>Percentage</i>
300	Working Conditions	5.5%
301	Mobilization/ Demobilization	4.0%
302	Contingency	11.0%
303	Engineering and Redesign	2.25%
304	Overhead and Profit	19.0%
305	Management Fee and Legal Expenses	4.0%
306	DEQ Oversight	4.0%

EnergySolutions' Proposed Amendment:

B. With the exception of Surety ID No. 301, Indirect Costs shall be based on the sum of all direct costs in accordance with the following values:

<i>Surety Reference No.</i>	<i>Description</i>	<i>Percentage</i>
300	Working Conditions	5.5%
301*	Mobilization/ Demobilization	4.0%
302	Contingency	1115.0%
303	Engineering and Redesign	2.25%
304	Overhead and Profit	19.0%
305	Management Fee and Legal Expenses	4.0%

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306	DEQ Oversight	4.0%
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**The mobilization factor is applied only to unit costs for moving equipment from one location to another under RS Means.*

EnergySolutions' Comment: *As part of its denial of EnergySolutions' request to apply RS Means City Cost indices to provide site-specific premature closure cost estimates, the Division also stated,*

"The mobilization factor is intended to be used only for moving equipment from one location to another under RS Means, and cannot be used for 'adjusting' other unit costs in surety to Clive."

EnergySolutions concurs with the Division's clarification of how industry commonly applies the mobilization factor. However, this common method of application is not accurately reflected in Condition 73.B(#301). Therefore, EnergySolutions proposes amendment to Conditions 73.B(#301).

DRC Response # 4:

This comment addresses two issues: the applicability of the City Cost Index for Salt Lake City, Utah to Clive, Utah, and the method of treating mobilization on the estimate.

EnergySolutions has proposed using the City Cost Index for Salt Lake City to estimate costs for Clive, 80 miles to the west. This issue received treatment on its own merits in the response to EnergySolutions' Comment #3. In summary, EnergySolutions has been provided opportunity to demonstrate that the costs for providing services in Salt Lake City mirror the costs for those same services in Clive. Until the DRC sees that information, the DRC has no basis on which to accept the method as valid for this application.

What follows describes the mobilization issue and efforts EnergySolutions has made to limit what can be considered in the mobilization line item, and to apply City Cost Index methodologies to mobilization.

Civil works projects involve two types of mobilization. General mobilization and demobilization "are always estimated and scheduled separately" and include such items as "maintenance shops; warehouse areas; worker changing and shower facilities; fuel, oil, and grease areas; power drops, electrical substations, and power distribution systems; compressed air and distribution systems; and water supply and distribution systems."⁵⁴ The general mobilization line item also includes preparation of the EPA-mandated storm water pollution prevention plan.⁵⁵ Specific Mobilization pertains to moving equipment or delivery of parts to the jobsite. RSMeans includes a method of estimating mobilization in

⁵⁴ Overhead and Uncertainty in Cost Estimates: A guide to Their Review, John M. Stolz, P.E., p. 2. http://www.jacobssf.com/images/uploads/10_Stoltz_Uncertainty-in-Cost-Estimates_NAT.pdf.

⁵⁵ Ibid., p. 2

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such cases, which can be factored into the equipment unit price, shown as a separate line item with each applicable piece of equipment, or summed and shown as a separate line item.⁵⁶

In general practice, both General Mobilization and Specific Mobilization are summed to form a single Mobilization line item in the cost estimate, or all mobilization is factored into other elements of the contract price. To aid in evaluating the reasonableness of surety estimates, the DRC prefers to see the mobilization charge separately accounted for in some fashion. In the case of EnergySolutions, the 2005 agreement between the DRC and the company spelled out a 4 percent mobilization rate to be applied to the sum of all direct costs.

EnergySolutions cited a DRC comment that "The mobilization factor is intended to be used only for moving equipment from one location to another under RSMMeans, and cannot be used for 'adjusting' other unit costs in surety to Clive." The context of that statement should receive consideration. EnergySolutions had proposed using the City Cost Index within RSMMeans across the board, including the items normally considered and aggregated under General Mobilization. That statement was a reminder to EnergySolutions that the City Cost Index formulae had specific limitations to their use. The manual identifies to what the City Cost Index applies: "Material and Installation costs, as well as the Total In Place costs for each [Construction Systems Institute] Master Format division. Installation costs include both labor and equipment rental costs."^{57,58} EnergySolutions had attempted to extend the mobilization factor to labor rates, then apply the city cost index to the result, which falls outside the areas where the instructions indicate that the method applies.

EnergySolutions' comment recognizes only Specific Mobilization. If EnergySolutions desires to begin accounting for Specific Mobilization in more detail, it must also reach agreement with the DRC on a method of accounting for General Mobilization.

After reviewing the comment and the licensee's proposed language, the Director has determined to retain the language in Condition 73.B.

⁵⁶ Facilities Construction Cost Data, RSMMeans, 2008, p. 1207.

⁵⁷ Facilities Construction Cost Data, RSMMeans, 2008, p. 1248.

⁵⁸ "The Construction Specifications Institute (CSI) is an organization that keeps and changes the standardization of construction language as it pertains to building specifications. CSI provides structured guidelines for specification writing in their Project Resource Manual, (formerly called the Manual of Practice (MOP))." From http://en.wikipedia.org/wiki/Construction_Specifications_Institute. The "divisions" referred to by RSMMeans are the headings under which the work items are grouped or organized to assist engineers and contractors in communicating about the project.

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EnergySolutions' Comment # 5:

5) CONDITION 73:

As currently Licensed: *The Licensee shall at all times maintain a Surety that satisfies the requirements of UAC R313-25-31 in an amount adequate to fund the decommissioning and reclamation of Licensees' grounds, equipment and facilities by an independent contractor. The Licensee shall annually review the amount and basis of the surety and submit a written report of its findings by December 1 each year for Director approval. At a minimum, this annual report shall meet the following requirements:*

EnergySolutions' Proposed Amendment: *The Licensee shall at all times maintain a Surety that satisfies the requirements of UAC R313-25-31 in an amount adequate to fund the decommissioning and reclamation of Licensees' grounds, equipment and facilities defined in Conditions 10.A and 10.B by an independent contractor. The Licensee shall annually review the amount and basis of the surety and submit a written report of its findings by December 1 each year for Director approval. At a minimum, this annual report shall meet the following requirements:*

EnergySolutions Comment: *EnergySolutions recognizes that Condition 73 provides protection to the State of Utah and its taxpayers against having to manage, close, and stabilize the Licensed Clive facility (in the event that EnergySolutions is defunct or otherwise incapable). While not specifically revised as part of the Divisions' proposed amendment 16 to the License, EnergySolutions has been notified that the Division interprets the surety requirements of Condition 73 as applying not only to grounds, equipment, and facilities directly associated within the physical bounds of radioactive waste disposal site closure and stabilization (e.g., licensed radioactive waste management activities that occur on Section 32), but all other company-owned uncontaminated structures, utilities, evidences of activity unrelated to the actual management of radioactive waste (not located within Section 32). As justification for claiming authority over the surety disposition of unlicensed physical property and assets owned by EnergySolutions, the Division cites concerns (without regulatory justification) over the fact that these unregulated facilities,*

"would constitute a nuisance that may lead to potential health and safety risks to the public, and almost certainly to increased security and maintenance costs to the DRC for the closed embankments and fences."

However, EnergySolutions notes that such interpretation is contrary to the Division's authority:

- "The applicant shall show that it either possesses the necessary funds, or has reasonable assurance of obtaining the necessary funds, or by a combination of the two, to cover the estimated costs of conducting all licensed activities over the planned operating*

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life of the project, including costs of construction and disposal" [emphasis added], [UAC R313-25-30].

- *"The applicant shall provide assurances prior to the commencement of operations that sufficient funds will be available to carry out disposal site closure and stabilization" [emphasis added], [UAC R313-25-31(1)].*

The use of the terms "licensed activities", "disposal" and "disposal site" within these regulations define the boundaries within which these surety requirements are applicable,

"Disposal' means the isolation of wastes from the biosphere by placing them in a land disposal facility"

"Disposal site' means that portion of a land disposal facility which is used for disposal of waste. It consists of disposal units and a buffer zone." [UAC R313-25-2]

Actions performed outside of EnergySolutions' licensed facility are not considered "licensed activities," according to UAC R313-25. As such, the numerous unlicensed and unregulated buildings, structures, and equipment EnergySolutions owns and uses to support its day-to-day business operations (such as the Administration Building located on Clive's Section 29, or EnergySolutions' Corporate Offices in Salt Lake City - Utah) do not fall within the area subject to the License as the Clive "disposal site."

Additionally, these privately-owned and unlicensed buildings and facilities are already governed by various zoning and business regulations of Tooele County and Salt Lake City. In recognition that these structures, in fact, are already regulated by other civil authorities, the Division met with Tooele County Planner, Kerry Beutler on May 20, 2013 to judge the manner in which Tooele County addresses EnergySolutions' unlicensed buildings. As a result of their assessment, the Division staff cited their lack of agreement with the manner in which Tooele County is overseeing EnergySolutions' unlicensed buildings and equipment as justification for their inclusion within the Division's jurisdiction. However, EnergySolutions notes that a mere lack of confidence or agreement with the appropriately-empowered civil authority does not allow the Division to assume regulatory authority over facilities or operations for which it has no statutory authority.

Additionally, in the highly unlikely event that EnergySolutions were forced to file for receivership or become otherwise financially incapable of managing its Clive facility, thereby triggering the transfer of the pledged surety funds to control of the Division for oversight of the closure and stabilization of the Clive disposal site, all of its unlicensed buildings, structures, and equipment would come under the control of the court-appointed trustee for satisfaction of outstanding creditors (and not under the direction, ownership, or oversight of the Division) and would be managed in accordance with the applicable laws governing protection of public health, safety and the environment.

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Therefore, there is no legal or regulatory justification for the Division's application of its surety requirements to EnergySolutions' unlicensed buildings and equipment.

DRC Response # 5:

EnergySolutions' reference to UAC R313-25-31(1) omitted the following two paragraphs that state:

- (a) decontamination or dismantlement of land disposal facility structures, and
- (b) closure and stabilization of the disposal site so that following transfer of the disposal site to the site owner, the need for ongoing active maintenance is eliminated to the extent practicable and only minor custodial care, surveillance, and monitoring are required. ...

Thus, sufficient funds are to be available to complete disposal site closure and stabilization including disposal facility structures in order to eliminate, "to the extent practicable," ongoing active maintenance. This provision does not limit the regulatory application based on whether a structure is "licensed" in the manner described by EnergySolutions' comment. The buildings and facilities now located on adjacent property owned by EnergySolutions fall within the intended application of R313-25-31(1).

The licensee is required to submit a decommissioning plan prior to decommissioning the facility. That plan must include several elements, including "how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and incorporated, as appropriate, following analysis of that advice."⁵⁹ Among the items specifically to be considered are the following: "Whether provisions for institutional controls proposed by the licensee [...] Will not impose undue burdens on the local community or other affected parties,"⁶⁰ "Whether the licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site,"⁶¹ and "In seeking advice on the issues identified in Subsection R313-15-403(4)(a), the licensee shall provide for: Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning; An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues."⁶² This rule applies to planned closure. No provision exists in rule, NRC regulation, or in guidance to address stakeholder concerns in the case of

⁵⁹ R313-15-403(4).

⁶⁰ R313-15-403(4)(a)(i)(C).

⁶¹ R313-15-403(4)(a)(iii).

⁶² R313-15-403(4)(b)(i) through (iii).

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default on the part of the licensee and premature closure of the site. Therefore, the DRC has relied upon representations made by EnergySolutions or its predecessor to address this need.

In its 2005 license renewal application, EnergySolutions' predecessor, Envirocare, made the following commitment: "Prior to termination of disposal activities by Envirocare, a detailed decontamination and decommissioning (D&D) plan will be developed. As part of decommissioning, the Site shall be returned as close as practical to its original contour, using preoperational survey data and interpolating uniformly between survey points. This will require that all structures (including any potentially contaminated underground items or material such as pipes and drain basins) be removed."⁶³ This statement is consistent with representations made at other times, as well.⁶⁴ EnergySolutions has included all buildings except the new administration building in calculations of materials to be removed and disposed in all annual surety submittals until the December 1, 2012 low-level waste surety submittal.

The DRC has no assurance that it will not be required by the bankruptcy trustee to maintain or dispose of the buildings in question. From the standpoint of financial assurance, the point at which the trustee makes a determination what to do with those facilities is too late to capture any required funding. In the absence of a public participation process and clear-cut contracts regarding the ultimate disposition of those facilities, inclusion in the surety seems prudent.

EnergySolutions cited a meeting with Tooele County Planner Kerry Beutler. In that meeting, Mr. Beutler stated that the County has no financial provision to maintain or provide security for those buildings, and that the County would look to the DRC to address the need for the appropriate associated closure and post-closure costs.

Buildings left at a remote site like Clive have the potential to become a nuisance to law enforcement, and to the security of the tailings embankments. Persons looking for an opportunity to assemble outside of public view may use these facilities as a gathering point, and subsequently breach or damage fences while accessing the waste disposal embankments. Under such conditions, these intruders could destruct or damage the embankments and be at risk to receive radiation dose potentially in excess of established standards.

Except for certain instances, and with the necessary documentation, licensees are not to include salvage value in estimates for decommissioning.⁶⁵ Declining to demolish a

⁶³ License Renewal Application: Radioactive Material License Number UT 2300249, June 20, 2005, p.U-1.

⁶⁴ See for example License Renewal Application: Radioactive Material License Number UT2300249, March 16, 2005, p. HH-1.

⁶⁵ See for example NUREG-1757, Volume 3, p. A-29. The NRC provided a footnote to this reference that states: "In some instances, NRC may approve credit for salvage value based on its review of explicit documentation provided by the licensee to justify the credit." The DRC has received no explicit data; only general statements.

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building because it may have value is a means of claiming a residual value for that building, with the cost of demolition and disposal forming the minimum value that the licensee sees in that facility.

After reviewing the comment and the licensee's proposed language, the Director has determined not to change the language in Condition 73.