

desorption process; (3) change the homogenous contiguous mass limit from 145 kg to 600 kg; (4) change the language and SNM limit associated with footnotes "c" and "d" of Condition 1 to reflect all materials in Conditions 2 and 3; and (5) omit the confirmatory testing requirements for debris waste.

A principal emphasis of 10 CFR part 70 is criticality safety and safeguarding SNM against diversion or sabotage. The staff considers that criticality safety can be maintained by relying on concentration limits, under the conditions specified. Safeguarding SNM against diversion or sabotage is not considered a significant issue because of the diffuse form of the SNM in waste meeting the conditions specified. These conditions are considered an acceptable alternative to the criticality definition provided in 10 CFR 150.11, thereby assuring the same level of protection. The staff reviewed safety aspects of the proposed action (*i.e.*, granting Envirocare's request) in the Safety Evaluation Report, dated January 14, 2003. The staff concluded that additional conditions were required to maintain sufficient protection of health, safety and the environment. The exemption conditions would be revised as follows:

1. Concentrations of SNM in individual waste containers must not exceed the following values at time of receipt:

Radionuclide	Maximum concentration (pCi/g)	Measurement uncertainty (pCi/g)
U-235 ^a	1,900	285
U-235 ^b	1,190	179 ¹
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

^aFor uranium below 10 percent enrichment and a maximum of 20 percent of the weight of the waste of materials listed in Condition 2.

^bFor uranium at or above 10 percent enrichment and a maximum of materials listed in Condition 2 of the weight of the waste of materials listed in Condition 2.

^cFor uranium at any enrichment with unlimited quantities of materials listed in Conditions 2 and 3.

^dFor uranium at any enrichment with sum of materials listed in Conditions 2 and 3 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 of waste.

2. Except as allowed by notes a, b, c, and d in Condition 1, 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.

3. Except as allowed by notes c and d in Condition 1, 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.

4. 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.

5. 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 and thermal desorption.

When waste is processed using the thermal desorption process, Envirocare 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 Condition 1. For containers of liquid waste with more than 600 kilograms of waste, the total activity (pCi) of SNM shall not exceed the SNM concentration in Condition 1 times 600 kilograms of waste. Waste containing free liquids and solids shall be mixed prior to treatment. Any solids shall be maintained in a suspended state during transfer and treatment.

6. Envirocare shall require generators to provide the following information for each waste stream:

Pre-Shipments

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 concentrations, 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.

Envirocare 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 Envirocare 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 1 through 4. Where generator process knowledge is used to demonstrate compliance with Conditions 1, 2, 3, or 4, Envirocare shall review this information and determine when testing is required to provide additional information in assuring compliance with the Conditions. Envirocare shall retain this information as required by the State of Utah to permit independent review.

At Receipt

Envirocare shall require generators of SNM waste to provide a written certification with each waste manifest that states that the SNM concentrations reported on the manifest do not exceed the limits in Condition 1, that the measurement uncertainty does not exceed the uncertainty value in Condition 1, and that the waste meets Conditions 2 through 4.

7. 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 the following the first 1,000 cubic yards of a waste stream. Sampling and radiological testing of debris waste containing SNM (that is exempted from sampling by the State of Utah) can be eliminated if the SNM concentration is lower than one tenth of the limits in Condition 1.

8. Envirocare shall notify the NRC, Region IV office within 24 hours if any of the above conditions are not met, including if a batch during a treatment process exceeds the SNM