



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

MS 20

Q-5

OCT 08 1992

MEMORANDUM FOR: Ronald R. Bellamy, Chief
Nuclear Materials Safety and
Safeguards Branch, Region I

FROM: John E. Glenn, Chief
Medical, Academic, and Commercial
Use Safety Branch, NMSS
Division of Industrial and
Medical Nuclear Safety

SUBJECT: TECHNICAL ASSISTANCE REQUEST FOR U.S. DEPARTMENT OF
AGRICULTURE, CONTROL NO. 114894

This is in response to your Technical Assistance Request dated August 6, 1992, providing supplemental information to the Department of Agriculture, Agricultural Research Service request for a one-time burial of animal carcasses containing radioactive material under 10 CFR 20.302. We have completed a review of the information the licensee submitted. We recommend that the license be amended to authorize the one time burial, provided the licensee specifies how often the site will be inspected to ensure the site security, and to ensure that the caution signs are still present.

We requested a statement from the licensee as to whether a notation had been made in local government land records as to the location of the radioactive waste. In response, the licensee submitted a copy of a letter notifying the Emergency Civil Preparedness office in Las Cruces, New Mexico of the burial. This letter does not serve as a formal deed restriction for the land. However, due to the licensee's commitment to maintain control of the site for twelve (12) years, we do not believe that a deed restriction is necessary.

We have enclosed a safety evaluation which includes a summary of the proposed action, a description of the burial site, and our conclusions. This document should be included in the official docket file. If you have any questions, please contact Torre Taylor of this staff at 301-504-2611.

A handwritten signature in cursive script that reads "John E. Glenn".

John E. Glenn, Chief
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

Enclosure:
Safety Evaluation Report

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DOCKET NO: 030-04530

APPLICANT: United States Department of Agriculture (USDA)
Agricultural Research Service (ARA)
Greenbelt, Maryland

LICENSE NO: 19-00915-03

SUBJECT: SAFETY EVALUATION REPORT
REQUEST FOR APPROVAL FOR BURIAL OF ANIMAL
CARCASSES PER 10 CFR 20.302, AGRICULTURAL RESEARCH
SERVICES JORNADA EXPERIMENTAL RANGE, DONA ANA
COUNTY, NEW MEXICO

Background

In letter dated June 27, 1991, USDA requested authorization for burial of animal carcasses containing radioactive material under 10 CFR 20.302 at USDA ARS Jornada Experimental Range, Las Cruces, New Mexico. The experimenter at the site buried the carcasses at the site without the apparent knowledge of the USDA Radiation Safety Staff in Greenbelt, Maryland.

Proposed Action

The proposed action is an amendment to USDA's radioactive material license, No. 19-00915-03, to authorize the burial of the animal carcasses.

Discussion

The burial site is located well within the boundaries of the USDA ARS Jornada Experimental Range. The nearest boundary of the Range from the burial site is just under 3 1/4 miles, which is 90 miles to the nearest town. Wells within a 5 mile radius of the site are solely for domestic stock water supplies and pump water from aquifers at a minimum of 300 feet from the surface. The annual average precipitation for this area is 9 inches.

The burial site is 30 feet long, 5 feet wide, 8 feet deep, with a minimum 6 feet overburden. An area 40 feet by 80 feet around the site will be fenced with metal "T" posts at 10 foot intervals with braces in two (2) directions at each of the four (4) corners. Four strands of barbed wire with no gates will be attached to the outside of the posts. Metal signs, measuring 8 inches by 12 inches, with the radiation logo and the words "Radioactive Materials" will be securely attached to the fence on each of the four (4) sides of the enclosure.

Enclosure 1

Based upon information provided by the USDA, the hydro-geology of the burial site is as follows. The burial site is in the sandy dune area on the eastern side of the Jornada Experimental Range. The water table in this vicinity is about 400 feet below the surface. A 10 to 12 feet layer of caliche (calcium carbonate layer above which evaporation exceeds percolation) is located 4 feet below the surface and approximately 2-3 feet above the buried materials. Leaching of materials should be negligible because of the arid nature of the environment and the layer of caliche.

Summary of material buried:

Animal carcasses buried:

- a. 48 adult Angora goats with an estimated weight of 2400 pounds
- b. 20 kid goats with an estimated weight of 150 pounds
- c. 40 adult coyotes with an estimated weight of 1,000 pounds

Isotopes and estimated activity:

<u>Isotope</u>	<u>Estimates in microcuries</u>		
	<u>Goats</u>	<u>Coyotes</u>	<u>Total</u>
Mn-54	----	7.2	7.2
Zn-65	93.2	5.2	98.4
I-125	----	71.0	71.0
Cs-134	81.0	5.0	86.0

Based on a review by the Division of Low-Level Waste Management and Decommissioning (LLWM), using conservative estimates of the source term and the environmental setting, the maximum potential dose to a hypothetical member of the public is calculated to be about 26 millirem per year. In reality, the maximum potential dose to a hypothetical member of the public would be much lower. Below is a list of the conservative estimates that were used in evaluating the dose from the site:

- a. Assumed all of the activity used in the experiment was in the carcass - not accounting for any decay, and the fact that not all of the activity was in the carcass (due to the nature of the experiment).
- b. Used a distribution coefficient of 1
- c. Assumed that all of the activity would go into the ground water.
- d. Divided the activity by 1/2 of the volume of waste, which increases the actual concentration.

- e. Decreased the distance to the water table from 121 meters to 4 meters. It would take 9 years for any activity to reach ground water at 4 meters. Therefore, the time to reach water at 121 meters is much longer, about 270 years. The longest half-life of any radionuclide is 2 yrs.
- g. Reduced the cover from 1.8 meters to 0.5 meters.

Need for Proposed Action

The animal carcasses were buried by the experimenter without obtaining approval through the USDA Radiation Safety Staff. USDA is now requesting approval, in lieu of recovering the carcasses for transfer to a low-level waste facility.

Alternatives to the Proposed Action

The alternative to authorizing the burial of the animal carcasses is to recover the carcasses for transfer and burial at a commercial low-level waste facility.

Conclusions

Based on the circumstances of the burial, the conservative estimates used in the evaluation, and the fact that this is a one time burial, NMSS is recommending that the USDA's license be amended to authorize the burial, provided the licensee controls access to the site, maintaining the fencing and posting of the area, for the 12 year period to which the licensee committed.



Torre Taylor
Commercial Section
Medical, Academic, and Commercial
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Approved by:

 10/5/92

Michael A. Lamastra, Section Leader
Commercial Section
Medical, Academic, and Commercial
Use Safety Branch