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June 25, 1987

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United States Nuclear Regulatory Commission Region IV Material Radiation Protection Section 611 Plaza Drive, Suite 1009 Arlington, TX 76011

REFERENCE NO. 030-13079 (Materials License Number 40-02194-17)

Gentlemen:

In reviewing the license application of June 14, 1983, for details of waste disposal, citations to inappropriate Sections of 10 CFR were found. Other procedures are cited that are not totally consistent with the waste disposal procedures permitted by 10 CFR 20. Therefore, the following is submitted as a total substitution for Item 14. Waste Disposal, page 37 - appended information of the application and for items 7 and 8 of the letter dated November 3, 1983.

14(a) NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

In 1982, Southwest Nuclear Company of Pleasanton, California, acted as broker for South Dakota State University for one shipment of radioactive sources for burial at Richland, Washington. This shipment consisted of 5 radium/beryllium neutron probes (soil moisture measurement) and one platinum-encapsulated radium source. The institution would use the services of this company or similar broker in the future in disposing of long-lived wastes if needed.

14(b) METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES

I. Waste material having an activity level below the concentrations specified for water in Appendix B, Table II, 10 CFR 20, will be disposed of as ordinary waste. (The concentrations for solids are expressed in microcuries per gram.) The activity will be determined using scintillation counting of three representative samples of the waste material unless the waste is deposited on a planchet. Planchets will be counted using a G-M end window tube housed in a lead pig. Samples having a total activity less than the values listing in Appendix C 10 CFR 20 will be disposed of as ordinary waste. The total activity will be determined by (a) scintillation counting, (b) calculation from time of purchase or last measurement, or (c) the quantities listed on the usage reports. Wastes in excess of these limits will be held for decay to these limits or disposal will be accomplished by one of the following methods:

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(i) Water soluble solutions.

Water soluble solutions containing licensed material will be discharged into the sanitary sewer in conformity with the requirements of 10 CFR 20.303.

The University sewer system is connected with the Brookings, South Dakota municipal sewerage plant. The annual average discharge of effluent from the University is approximately  $1 \ge 10^9$  mL/day.

All discharges of licensed material into the sanitary sewer will be made by the Radiation Safety Officer or at his direction. He will maintain a record of these disposals. No record will be kept of the small and relatively insignificant amounts of water soluble activity that may be released incidental to the use of the material. Examples of incidental discharge include glassware washing and glassware rinsing.

(ii) C-14 and H-3 in scintillation fluids.

Disposal of these materials will be in conformity with the requirements of 10 CFR 20.306.

(111) C-14 and H-3 in animal and plant tissue.

Disposal of C-14 and H-3 in animal tissue will be in conformity with the requirements of 10 CFR 20.306.

Disposal of 0.05 uCi or less of H-3 or C-14 per gram of plant material, including seeds and material derived from plants, averaged over the entire sample will be consistent with the provisions of 10 CFR 20.306(b) including the requirement the material not be available as food for humans or as animal food.

(iv) Sealed Sources.

Sealed sources will be returned to the manufacturer or supplier whenever possible. If such a return is not possible, the sources will be stored in a restricted area under the control of the Radiation Safety Officer until such time as disposal may be arranged using the services of a licensed broker. If material is transferred to a broker, South Dakota State University will comply with the provisions of 10 CFR 20.311, 10 CFR 61 and any other applicable regulations in force at that time.

(v) Solid and Water Immiscible Solvent Wastes

Subject to any applicable EPA regulations, disposal of solid wastes or liquids that are immiscible in water will be by incineration.

Examples of solid wastes include greenhouse soil samples used in plant studies and the plant material grown in these studies,

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plastic gloves, pipets, absorbant paper, syringes, test tubes and "empty" sample vials.

Scintillation counting fluid used in studies involving beta emitters (other than C-14 and H-3) is the major source of water immiscible waste.

Incineration will be accomplished under the supervision of the Radiation Safety Officer in a unit attached to the Veterinary Science building. The incinerator is normally used to dispose of animal carcasses and microbiological materials generated by the work of the Veterinary Science Department and South Dakota Animal Disease Research and Diagnostic Laboratory. The rated blower capacity of this gas fired incinerator is 47,000 CFH. A flow rate of 45,000 CFH, equivalent to  $2.1 \times 10^7$  mL air per minute, is used to determine the effluent discharge concentrations.

The activity of the gaseous effluent from the incineration will not exceed the limits specified for air in Appendix B, Table II, 10 CFR 20. After appropriate surveys are made the ash will be disposed of as ordinary waste if the concentrations of licensed material appearing in the ash residue does not exceed the concentrations (in terms of microcuries per gram) specified for water in Appendix B, Table II, 10 CFR 20.

The activity that may be incinerated at any one time is determined by a practical limit of 18 hours for use of the incinerator and the effluent limits of Appendix B. Examples of the limits are:

| Operating time: | 0.5 hour  | 18 hours  |
|-----------------|-----------|-----------|
|                 | (typical) | (maximum) |
| H-3             | 126 uCi   | 4.5 mC1   |
| C-14            | 63 uCi    | 2.3 mC1   |
| S-35            | 5.7 uCi   | 0.2 mCi   |
| Se-75           | 2.5 uCi   | 0.09 mCi  |

Records will be maintained by the RSO of the radionuclides, the activity before incineration and the ash survey.

For South Dakota State University,

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Leo H. Spinar, Professor Radiation Safety Officer

LHS:pk cc President Robert T. Wagner