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APPLICATION FOR MATERIAL LICENSE SUPPLEMENTARY INFORMATION TO U.S. NRC FORM # 313

5. RADIOACTIVE MATERIAL

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	BYPRODUCT	CHEMICAL AND/ /	TAUCMA MUMIXAM
Α.	Any byproduct material with Atomic Numbers 1-83	A. Any A	A. 1 millicurie total
B.	Hydrogen 3	B. Any	B. 20 millicuries
C.	Carbon 14	C. Any	C. 50 millicuries
D.	Nickel 63	D. Foils or plated sources in Hewlett-Packard Model 18803-60520 detector cells	D. Not to exceed 15 millicuries per source
E	Sulfur 35	E. Anu	E. 50 millicuries

- 6. The purposes for which the licensed materials will be used are for radioactive tracers in biochemical and ecological research. Also they will be used as sealed sources for gas chiomatography detectors.
- Individuals responsible for radiation safety program are the members of the radiation safety committee whose training and experience are given as follows.
 - A. Dr. Earl W. Davey, Radiation Safety Officer and Committee Chairman.

1964-1967: Oregon State University, as a graduate student working on M.S. and Ph.D. degrees in Chemical and Biological Oceanography

- Formal courses in Radio-tracer Methodology which involved lecture and laboratory work with radioactive tracers and beta and gamma counting equipment.
- (2) Thesis work which involved laboratory and field carbon-14 productivity measurements.

1968-present: Environmental Protection Agency (1) Marine phytoplankton uptake of carbon-14.

(2) Isotope uptake on chelating resins with zinc-65, cobalt-60, iron-55, manganese-54, cadium-115m, silver-110m, and copper-64

- (3) The chemical preparation and counting of various environmental samples for uranium-234&238, thorium-224&238, plutonium-238, 239&240, polonium-210, americium-241 and the beta emitters of lead-210 and cesium-137.
- (4) Tracing the fate of various carbon-14 labelled organic compounds in marine microcosms
- (5) Monitoring the bioturbation and resuspension of biota in marine microcosms utilizing radioactive microspheres.
- B. Dr.C.S. Hegre
 - 1959-1963: During graduate training and research in biochemistry used C-14 in single sample amounts up to 100 microcuries P-32 up to 1 mc, H-3 up to 1 mc, and Na-24, 10 u. Research was under the direction of Dr. M.D. Lane.
 - 1960- : Attended three-month course given by Dr. Merrill 8 Reed on Radiation Applications to Biological Systems.
 - 1962- : Attended three-month course given by Dr. McPherson Radiochemical Tracer Techniques. Course involved the use of Pb-212, Bi-212, RaE, Co-60, T1-204, Zn-65, Cs-137, S-35, I-131, and Mn-54. Course covered counting, handling, theorectical aspects and calculations.
 - 1963- Ph.D. in Biochemistry, Virginia Polytechnic Institute.
 - 1967-present: Environmental Protection Agency Served on the radioistope come lee, and attended a three hour course on radioistope safety.
- C. Mr. George Morrison

1967-present: Environmental Protection Agency

- (1) Primary produtivity carbon-14 measurements.
- (2) Tracer uptake studies of biota and sediment using cadmium-109.
- (3) Indicator of particle removal by filter feeding organisms using cerium-141 labelled microspheres.
- (4) Fate of various carbon-14 labelled organic compounds in marine microcosms.

- 8. Training for workers using radioisotopes consists of a formal 1-2 hour training session with the radiation safety officer and working directly with an experienced person until the safety officer is satisfied with the compentence of the individual. General reading material is supplied and special in-house regulations are required reading. Other personnel, such as janitors, are also instructed on avoidance of radiation areas and containers designated by labels and signs. Periodically, special radiation lectures are presented to the staff.
- 9 The EPA-ERLN is a modern well equipped biological and chemical laboratory. We possess and utilize the following radiation counting and safety equipment and facilities.
 - A. Packard 1500 Tri-carb Liquid Scintillation Counter (LSC).
 - B. Packard 640C LSC.

- C. Ortec gamma counting electronics plus a sicron 3K3 inch NaI(T1) crystal with a well.
- D. Nuclear Chicago survey meter
- E. Hazardous materials building, separate from our main laboratory, for the storage of radioactive materials and wastes.
- F. Laboratory hoods.
- G. Dosimeters.
- H. Special trash containers for radioactive wastes.
- Routine equipment used with low energy beta such as gloves etc.

10. The radation safety program is synonymous with the function of the EPA-ERLN radation safety committee described as follows.

A. Responsibilities and Authority:

- 1. To review and grant permission for, or to disapprove the use of, byproduct material for experimental purposes within the laboratory. Approval shall be by the whole committee. Failing this, a use shall be judged disapproved. The committee may, if necessary, withdraw permission for and order the termination of a given use or procedure. Judgements of the committee shall be based on considerations of radiological safety, training of the individual(s) in the use of radioactive materials, and adequacy of facilities and equipment for the particular use and other considerations which may, from time to time, seem necessary. Under no conditions may the decision of the committee be based even in part on value judgements of the scientific merit of the proposed use. Such judgements are properly made by the appropriate research supervisor.
- To prescribe special conditions that will be required during a proposed use of a byproduct material such as bioassay procedures and to prescribe a minimum level of training and experience for users.
- 3. To recommend remedial action to correct safety infractions.
- 4. To maintain written records of actions taken by the committee.
- To receive and review records and reports from the Radiation Protection Officer or other individuals delegated responsibility for health practices.
- 6. To inform the Commission of any changes in committee membership.

8. Committee Administrative Procedures:

- The committee will meet when necessary, or quarterly to consider new proposals, review existing programs and to receive monitoring and inventory reports. Special meetings may be called if circumstances warrant.
- 2. The minutes of the committee meetings will constitute written record of its actions. Reports of the Radiation Protection Officer as well as monitoring reports and inventory data obtained by him will become part of these minutes. Decisions of the committee affecting the laboratory as a whole will be conspicuously posted. Other decisions will be communicated in writing to the appropriate research director(s).
- 3. The Radiation Protection Officer may delegate the responsibility for obtaining monitoring, receipt, transfer, and disposal information but will remain responsible for keeping records of such information. The representative of the Administrative Office of the laboratory will make available to, and call to the attention of, the Radiation Protection Officer all requisitions for the purchase of byproduct material.

10. C. Radiation Protection Officer - Scope of Duties and Responsibilities:

- 1. The Radiation Protection Officer is acting under the authority of the Isotope Committee.
- He shall, in consultation with others, advise on procedural matters with regard to experimental technique to minimize hazard.
- 3. He shall receive all isotope shipments, monitor them during unpacking, record their receipt and place of storage, and assure their security during storage.
- 4. He shall transfer isotopes from storage to authorized users and record such transfers.
- 5. He shall receive and record monitoring reports and maintain records of exposure for each user.
- 6. He shall, as often as is necessary, count both liquid and solid wastes in the holding containers and transfer these wastes to containers provided by the disposal company, keeping a record of the amount of each isotope so transferred.

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- 7. He shall report to the Isotope Committee the monitoring and inventory records.
- 8. He shall advise upon and, if necessary, supervise decontamination of spill areas.
- 9. He shall ensure that all radioactivity measuring instruments are in working order and that work areas are properly labelled.
- 11. The above responsibilities are to be shared equally between the Alternate Radiation Protection Officer with due care that each knows when he has assumed the duty.

 Waste is collected in specially designated containers at the work site. Separate containers are supplied for liquid and solid wastes and a third container for liquid scintillation vials. All radioactive wastes are inventoried with the radiation safety officer before they are taken to the hazardous materials building and placed into the appropriate waste storage drum. Full drums are properly recorded, inspected, and labelled by the radation safety officer before they are picked up by a licensed carrier for transport to the state of Washington for final disposal.

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